## EDITORIAL

**Quantum World View**
Belle M Hegde

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INTRODUCTION
Formerly known as ‘The Journal of the Kuwait Medical Association’, the Kuwait Medical Journal (KMJ) was established in the year 1967. It is the official publication of the Kuwait Medical Association and published quarterly and regularly in March, June, September and December.

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KMJ aims to publish peer-reviewed manuscripts of international interest. Submissions on clinical, scientific or laboratory investigations of relevance to medicine and health science come within the scope of its publication. Original articles, case reports, brief communications, book reviews, insights and letters to the editor are all considered. Review articles are solicited. Basic medical science articles are published under the section ‘Experimental Medicine’.

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The Kuwait Foundation for the Advancement of Sciences
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Editorial

Quantum World View

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Kuwait Medical Journal 2016; 48 (3): 194 - 196

“Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius and a lot of courage to move in the opposite direction.”

EF Schumacher

Science is the biggest enterprise that man ever created. Of all the living things on this planet, man is the only one that seems to have started thinking about how this world works. To understand that, he started this new venture called science, which was originally meant just to understand how this world works. Some exceptionally brilliant minds did accidentally tumble upon some understanding of the world’s laws, like gravity, buoyancy and others in the west, while the Indian sages had realised this much earlier. Next step was to find out how the world works by doing some experiments. That was the stage, the western churches started obstructing their work as this kind of scientific enquiry, they thought, might interfere with the religious belief. That is where the first conflict between religion and science started. The fall out was that the scientists subconsciously developed an aversion to the God concept in religion and thus God was kept out of the scientific realm.

Now that has become a fad and fashion with the young budding scientists to call themselves as atheists. To cap it, a young brilliant mathematical brain of Rene Descartes assumed all power to himself by declaring “Cogito ergo sum” (I think, therefore, I am). If he were a lot more experienced and wise, he would have realised that was his perception, and not the world view. There is no perception without a perceiver. In short, we do not have a universe but a multiverse of perceptions, otherwise called the concept of biocentrism. Each one of us, including animals, has his or her own perception, which is different from others. The world does not run because of that. The real thing should have been “I am, therefore, I am able to think.” Let us therefore, think from hereafter.

More and more people started dabbling in science as the world had enough to eat and exist. Finding one’s next meal was not that difficult. Science then was more of a hobby for the well to do. The leading lights of that generation were Isaac Newton and Albert Einstein. There were a host of others, but less illustrated than the above two, and so are not mentioned here although some of them like Werner Heisenberg were wiser. Newton’s Laws of deterministic predictability and Einstein’s laws of relativity together founded a world view of “space-time” constraints where everything else, out with this space time module, was rejected. They, along with others, tried to split an atom to study the subatomic particles, which in itself was another big business resulting in the atomic bomb! I still remember the words of Max Planck following the bomb blast. “I am proud of my students’ cleverness in splitting an atom but am wondering, if that atom that they have split might tech mankind a bitter lesson one day which might be too costly for mankind” According to the Space Time world view, the speed of light should be the fastest.

When this group had some confusion, they would call for a Copenhagen Conference where the problems would be discussed and “settled”? They did not look beyond their noses. They patted each other’s back either by their Nobel Prizes or for their Fellowships of Newton’s Royal Society. Buoyed up by the successful

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technological advances of their initial scientific laws like the aeroplane, communications' facilities, infrastructure, industrial growth, atom bomb, space travel, weapons of mass destruction, hi-tech medical quick-fixes etc., scientists also became money wise. Money spoils man. This scientific world view makes man to be arrogant with some scientific authority. They are bound to sell their souls, which in fact, is a sordid boon. They embarked on some funny experiments to split the particles further by colliding them at the speed of light in large submerged reactors at an enormous cost like the CERN scientists looking for the building blocks of this universe. Along with particle physics other natural sciences like chemistry and biology also adopted this reductionist mind set. Evolution was said to be genetic based on Darwin-Mendel hypothesis forgetting the vital role the whole environment plays on evolution, initially put forward by Lamarck. New Evolutionary biologists like Elisabet Sahtouris have tried to revolutionise the field of evolutionary biology, where the world view in totally new.

Some thinking physicists started wondering about the behaviour of subatomic particles not confined to the Space time constraints. The particle wave distinction also died down gradually when they could easily discern that both the waves and particles are, but the two faces of the same coin. In his article for lay people, Hans Peter Durr, a former Emeritus Director of the Max Planck Institute wrote “my job was to look at matter at its subtlest level, and going down the line at one stage, I found that there is no matter at all. Was I surprised-not at all? I expected that!” Starting from Max Planck, de Broglie, Paul Dirac, Heisenberg, Schrodinger and many others went ahead with the new ideas and we have now reached a stage where physics took a quantum jump into this new field of quantum physics which has created a new world view which comes closer to reality compared to the old “Space-Time conundrum.” For a novice it is a bit confusing as this new world view is more of a possibility than actuality. This comes into view when we look at it and we do not know what happens when we do not look. However, no more doubt remains as most of the new concepts are proven by experimentation. Werner Heisenberg, Niels Bohr, Max Born and Wolfgang Pauli finally resolved the paradox of this “quantum physics” in 1925 with a radical re-interpretation of the dynamics. “It demanded a revolution in what had been the classical view of the world, with the surprising recognition that matter is not really material at all, but a web of relationships, a kind of gestalt, or in a certain way “information” without any carrier.” Hans Peter Durr had a better word in German, the Wirklichkeit.

Experimental physicists have shown that a particle, like in the double slit experiment, could be directed to go through the path that the experimenter wants it to take-mind at work! Non-locality, a concept that Albert Einstein did not agree till his last breath, is a reality now. Einstein called it “spooky action at a distance-God playing dice” etc. This reality was a well known entity in Eastern philosophy, especially Indian Vedanta. Teleportation, transfer of knowable or known entity from one place to another without loss of time, and with no communication facilities, has brought spirituality closer to science. When one tries to understand the new quantum physics, one is struck by the existence of a superior intelligence (consciousness) at work in this world. Consciousness has now become a scientific concept and has revolutionised medical science in a big way. That is why I am into this field. Non locality brings in telepathy, a well known concept in Vedanta. Non locality shows that there is a possibility of a particle having its counterpart active at a distance simultaneously. Quantum entanglement brings us together. Many other concepts like quantum Tunnelling etc. take this science nearer to mysticism. Mystics were able to transfer their powers to others. Experiments now have shown, how induced brain waves could be simultaneously seen in other brains in contact with the first one psychologically. Are you reminded of telepathy, not an unusual experience in thinkers?

Physics still has to grapple with 95% of dark matter and energy. This is possible with Indian Vedanta. The auto-biography of one of the founder fathers of quantum world, Erwin Schrödinger, claimed that he obtained his central intuition from the Vedas. This is a singular credit, because without quantum mechanics, one cannot understand chemistry, and without chemistry one cannot understand biology and life. Schrödinger and Heisenberg created a universe based on superimposed inseparable waves of probability amplitudes, the sea of waves, and a view consistent with the Vedic concept of “All in One.” One could argue that the parallels or analogies between Vedanta and quantum theory are merely coincidental. But one can certainly say that Vedanta did not follow (plagiarise) quantum logic!

The earlier science gave an impression that man is the one who can make this world run as per the laws of deterministic predictability within the constraints of space time, with speed limited to the speed of light. The Indian concept of manovega, the speed of the mind, is a reality in the quantum world. Quantum world view teaches us that we are all the same wave energy and, therefore, interconnected. Once this world view gets currency, all negative human thoughts like hatred, anger, jealousy and greed will have to be replaced by universal compassion making wars and terrorism look foolish and non-productive. When we harm someone
else whom are we harming but ourselves? Diseases take a back seat as all of them start in the human mind in negative thoughts. The human mind was confined to the human brain in the earlier world view, but quantum world view brings it out in the open as a part of this big universal wave (consciousness). The world can now be compared to the wide sea where we, as individuals, are but a small wave. We ARE a part of that sea. This should make man humble and, consequently, educated. The earlier world view with all its prizes and awards used to make man arrogant and sick. “But man, proud man, dress’d in a little brief authority, most ignorant of what he’s most assur’d - His glassy essence - like an angry ape plays such fantastic tricks before high heaven as makes the angels weep.” The word “I” used to dominate (starting illness). Now the word is WE (meaning wellness). In the Quantum world view, your award is your capacity to be compassionate. This new science opens the flood gates to quantum healing, a limitless field. This also leads to the inner development of man for the good of mankind.

That said, I must hasten to add that there will not be too many to buy this truth as this is not a good business proposition and might not allow us to make money like the reductionist world view of the past. My good friend, Amit Goswami, a bright Bengali professor of Theoretical Physics at the Oregon University, USA, is trying his level best to spread the message of quantum physics to the world. He is doubly qualified as he is a scholar in Indian Vedanta as well. My hope is that this scientific truth of quantum reality would bring man and man together.

“To Give without Remembering & Receive without Ever Forgetting.”
“I don’t argue things being spiritual vs scientific, because I’ve never met anyone who knows enough about either to be convincing - including myself.”

S. Kelley Harrell
Original Article

Caregiver Burden among Peritoneal Dialysis and Hemodialysis Family in Saudi Arabia

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Kuwait Medical Journal 2016; 48 (3): 197 - 201

ABSTRACT

Objectives: Dialysis patients often depend on family caregivers to assist them with their daily life activities and medical needs. Since few studies were conducted, we compare the quantitative burden on family caregiver between hemodialysis (HD) and peritoneal dialysis (PD) in Saudi population.

Design: This cross-sectional study was performed by applying Zarit Caregiver burden interview (ZBI).

Subject: Fifty HD and 55 PD Saudi caregivers (from July 2010 till July 2011)

Setting: King Saud University affiliation hospital, Riyadh, Saudi Arabia

Results: In both dialysis therapies, the caregivers were mostly female comprising 35 (70%) HD and 43 (78.2%) PD with p = 0.338. Mean caregivers’ age in HD was 40.6 (11.0) while PD was 37.5 (9.1) years with p = 0.178. The total burden in caregivers of PD group was 49.9 (24.5) which is higher than HD group 43.3 (21.7), with p = 0.15. The caregiver burden score is highly significant with patients’ age in both dialysis (p <0.01) but negatively correlated with patients’ level of education (p = 0.05) in hemodialysis only. The caregiver burden score showed high correlation with caregiver education (p <0.01) and age in hemodialysis only (p <0.01).

Conclusion: The caregiver burden among PD and HD family ranked from moderate to severe burden. The correlation between caregivers’ burden scores and caregivers’ education, caregivers’ age and patients’ education are negatively correlated only in HD. However, the correlation between caregivers’ burden scores and patients’ age are significant in both HD and PD.

KEY WORDS: burden, caregiver, dialysis, King Saud University, Saudi

INTRODUCTION

End stage renal failure is usually treated by transplantation, central or hospital hemodialysis and home peritoneal dialysis. Hemodialysis is usually performed in three sessions per week and each session is usually conducted for four hours. Peritoneal dialysis is usually done at home manually by exchanging the fluids every six hours, or at night using peritoneal dialysis machine for dialysis for nine hours.

Dialysis patients often depend on family caregivers to assist them in their daily life activities and medical needs. However, the duties included driving to dialysis center, maintenance of personal hygiene, medical administration, following special diet instructions, other medical inquiries and appointments. Caregivers usually experience physical and psychological distress as well as limitations to their personal, social activities, and financial burden1, 2. Additionally, patients’ circumstances can have strong impact in the caregivers3, 4. The numbers of dialysis patients worldwide is constantly growing which has been detailed in the 2011 annual report of the Saudi Center for Organ Transplantation (SCOT). From 13,356 of total dialysis patients, 12,116 were reported as hemodialysis patients and 1,240 as peritoneal dialysis patients5.

To determine the burden in the caregiver of patients with chronic illnesses, Zarit Caregiver burden interview (ZBI) was performed in various studies6, 7.

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In addition, it was also conducted to assess the burden in hemodialysis and peritoneal dialysis caregivers which showed caregiver burden range from mild to moderate score.

Few studies were conducted by comparing caregivers’ burden in hemodialysis and peritoneal dialysis. This indicates a worst outcome in peritoneal dialysis caregivers. In this study, our aim is to compare the quantitative burden of family caregivers in HD and PD patients in Saudi Arabian population using Zarit Caregiver burden interview (ZBI) and to analyze the factors associated with this score.

MATERIALS AND METHODS
This is a cross-sectional, descriptive study conducted in affiliation with King Saud University, Riyadh, Saudi Arabia from July 2010 – 2011 comprising all consented primary family caregivers who were considered as members of the family mainly responsible for looking after the hemodialysis and peritoneal dialysis patients and most closely responsible in his/her care. The inclusion criteria were caregivers with age >18 years, caregivers for hemodialysis patients who had three sessions per week and home peritoneal dialysis caregivers who performed three or more fluid exchanges per day. An interview was conducted by the co-investigator to the caregivers through personal or phone interview.

The only exclusion criterion was the caregivers who were caring patients with stroke or dementia.

Caregivers’ backgrounds are comprised of age, sex, work status, marital status, level of education, and health problems. Other burdens of the caregivers are family member of the patient taken care by the caregiver.

Caregiver Burden Interview: Subjective Caregiver Burden was calculated using Zarit Caregiver Burden Interview (ZBI) which was developed by Zarit in 1985. This scale categorized the Burden Interview through factor analysis that yielded two factors that represent the dimensions of personal strain and role strain. The instrument was translated into Arabic language. It was tested and validated by Bachner Y.

Scoring: The level of subjective burden was determined accordingly from little to no burden which ranges from 0 - 20, then 21 - 40 for mild to moderate, then 41 to 60 for moderate to severe and 61 - 88 for severe burden. This study was approved by Institutional Review Board in King Saud University for its completion.

Statistical analysis: The SPSS v 18.0 statistical software package was used for statistical analysis. ANOVA variance test and Pearson correlation was

<table>
<thead>
<tr>
<th>Table 1: Comparison of hemodialysis and peritoneal dialysis patients' personal characteristics in the two study groups</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient characteristics</strong></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Age (years)</td>
</tr>
<tr>
<td>&lt;40</td>
</tr>
<tr>
<td>40 - 60</td>
</tr>
<tr>
<td>&gt;60</td>
</tr>
<tr>
<td>Range</td>
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<tr>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Gender</td>
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<td>Male/Female</td>
</tr>
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<td>Dialysis duration (months):</td>
</tr>
<tr>
<td>&lt;24</td>
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<tr>
<td>24 - 60</td>
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<tr>
<td>Range</td>
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<tr>
<td>Mean (SD)</td>
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<td>Spouse/children</td>
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<td>Basic/intermediate</td>
</tr>
<tr>
<td>High Education</td>
</tr>
<tr>
<td>Marital status</td>
</tr>
<tr>
<td>Married/Unmarried</td>
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</tbody>
</table>

(*) Statistically significant at p <0.05
used for the analysis and collection of quantitative variables. Multiple stepwise backward regression analysis was used, and analysis of variance for the full regression models was done. Statistical significance was considered at $p$-value <0.05.

RESULTS

The socio-demographic characteristics of 50 hemodialysis and 55 peritoneal dialysis patients are shown in (Table 1). As observed, both sexes represented nearly similar frequencies in the study sample. Patients’ mean age in hemodialysis were 46.6 (14.0) year and in peritoneal dialysis 56.2 (13.9) year with $p = 0.001$. The mean hemodialysis duration was 75.1 (62.8) months compared to 26.5 (12.0) in peritoneal dialysis patients with $p <0.001$. Hemodialysis patients had a higher educational attainment while the percentage of illiteracy in peritoneal dialysis patients was 56.4%. Our data also showed that 40.0% of hemodialysis patients were unmarried and 85.5% of peritoneal dialysis patients were married ($p = 0.003$).

The personal characteristics of caregivers in hemodialysis and peritoneal dialysis are shown in (Table 2). In both dialysis therapies, caregivers were mostly female, unemployed and married housewife. Half of the caregivers were reported to have health problems.

In our study, we present the comparison in hemodialysis ($n = 50$) and peritoneal dialysis ($n = 55$) caregiver burden score in role, personal and total domain which we illustrate in mean ± standard deviation. The role domain in caregiver burden score between caregivers’ age and the total score ($r = -0.444$, $p <0.01$), role strain ($r = -0.386$, $p <0.01$), and personal strain ($r = -0.458$, $p <0.01$). Moreover, using

<table>
<thead>
<tr>
<th>Patient characteristics</th>
<th>Group</th>
<th></th>
<th></th>
<th>Chi-Square Test</th>
<th>p-value</th>
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<tr>
<td></td>
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<td>Peritoneal dialysis (n = 55)</td>
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<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Age (years)</td>
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<tr>
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<td>Range Mean (SD)</td>
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<td>Gender</td>
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<td>43</td>
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<tr>
<td>Have children</td>
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<td>14</td>
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<td>Have health problems</td>
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<td>18</td>
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<td>64.0</td>
<td></td>
<td>32</td>
<td>58.2</td>
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</table>

(*) Statistically significant at $p <0.05$
the Spearman rank correlation, we found significant correlation between caregivers’ level of education and the total score \( r = -0.416, p < 0.01 \), role strain \( r = -0.334, p < 0.05 \), and personal strain \( r = -0.458, p < 0.05 \). Conversely, in peritoneal dialysis group, we found that there are no statistically significant correlation between caregivers’ burden scores (role, personal and total) and age, duration and level of education \( p > 0.05 \). We also obtained correlation values for age \( r = 0.256, p > 0.05 \), duration \( r = -0.077, p > 0.05 \) and education \( r = 0.144, p > 0.05 \) in role domain. Respectively, the correlation values for age were \( r = 0.129, p > 0.05 \); for duration, \( r = -0.009, p > 0.05 \) and for education, \( r = 0.226, p > 0.05 \) for personal domain. Consequently, the correlation values were \( r = 0.175, p > 0.05 \) for age; \( r = -0.035, p > 0.05 \) for duration and \( r = 0.146, p > 0.05 \) for total domain.

**DISCUSSION**

Family caregivers experienced a relationship burden based on role strains and unhealthy feeling such as grief, loss, sadness, anger, frustration, shame, and guilt resulting from taking care of patients with chronic diseases at home [2, 3].

Strain and burden, if left untreated, can result to poor physical and mental well being of the family caregivers [14, 15]. For these reasons, our study intended to investigate and differentiate the burden of family caregivers in both hemodialysis and peritoneal dialysis patients. However, some literatures provide conflicting views regarding the caregivers’ characteristic and score of burden. In our study, we reported that the total caregiver burden enrolled in peritoneal dialysis group 49.9 (24.5) was higher than caregivers in hemodialysis group 43.3 (21.7). However, this data appeared to be not statistically significant, since it scored from moderate to severe burden in both dialyses. We also showed the correlation between caregiver burden score and the age of patients in both hemodialysis and peritoneal dialysis. Nevertheless, the caregiver burden score showed a negative correlation with patient level of education, caregiver level of education and caregiver age in hemodialysis group. Our study differs with Saksako Shomoyamo from Japan which showed that the mean caregiver burden calculated by the use of ZBI was 14.1, which is considered as low. This difference can be related to a younger age in peritoneal dialysis in Japan since their mean age was 48.2 years while the mean age of our patient was 56.2 years, whereas more than 83.6% of our patients were >40 years old and 52.7% more than 60 years. In addition, the mean age of caregivers in Japan were 46.4 years compared to our younger caregivers, where the mean age was 37.5 (9.1) years.

Our study agrees with the study of Avsar U et al, in which they compared the caregiver burden to patient caregivers in peritoneal dialysis and to transplanted group which showed that more than 68% of caregivers in peritoneal dialysis had moderate to severe scores which indicates that CAPD caregivers had 2.61 times (95% confidence interval, 1.03 - 6.59; p = 0.043) greater burden than those in transplanted group. Belasco et al studied the quality of life of family caregivers of elderly patients on hemodialysis and peritoneal dialysis; and found that most caregivers of the elderly aged 55 (15) years were women (78%), sons or daughters of the patients (41%) and 50% of the patients were wives or husbands. These results are in accordance with the findings of the present study, that the mean age of the caregivers’ of HD patients are older than caregivers’ of the PD group and the total burden was higher in the caregivers’ of PD patients than caregivers’ of the HD patients.

We also found out that the effect of educational level may decrease the burden of hemodialysis caregivers [10]. However, Suri et al reported that more than one-quarter of 236 unpaid caregiver participants in hemodialysis patients had extremely high perceptions of burden and were not associated among perceived caregiver burden with demographic factors such as age, sex, race and level of education [1]. Our findings showed that the caregivers’ level of education is statistically significant and was a negative predictor to the total burden of caregivers in HD group, but not in PD, since most of our PD patients and caregivers were illiterates or had only basic or intermediate education.

Since PD is a home dialysis, it should be compared with home hemodialysis, as Mollaoglu M showed that the mean ZBI score in caregiver of home hemodialysis patient was moderate to severe 52.1 (18.6%) which has the same score with our PD caregivers (49.9, 24.5%). However, his study showed that the mean score of ZBI was significantly high in young caregivers and with high educational level. However, we had a contrasting result since our study found that the total burden scores were negatively significant in hemodialysis patients, but not in peritoneal dialysis. This can be explained as our hemodialysis patients were under hospital care and not at home.

Despite the growing recognition of the burden and adverse effects of CKD in informal caregivers, very little evidence is available about the effect of information or support interventions on their physical or psychosocial well-being. The lack of evidence may be due to inadequate advocacy, funding and support resources available to develop, implement and evaluate the support and information interventions for informal caregivers.
Limitations
The limitation of this study is that it consisted of a small sample size and that the study was done in single tertiary dialysis hospitals which do not represent the whole population of dialysis caregivers in Saudi Arabia.

CONCLUSION
In conclusion, this study highlights the value of subjective burden in family caregivers of dialysis patients who had variable degrees of burden between both groups. Our study reported that the caregiver burden among PD and HD family ranked from moderate to severe levels. The burden increased in hemodialysis caregivers with the increase in age of the caregiver and patient as well as with the decrease in the level of education of hemodialysis patients and caregivers.

ACKNOWLEDGMENT
We would like to acknowledge the Institutional Review Board, Deanship of Scientific Research of King Saud University for its approval to complete the study. Also, we would like to extend our appreciation to Prof. Adel Mishkiry (Faculty of Medicine, Community Medicine Department, Suez Canal University, Ismailia, Egypt) for collaborating in this study.

Conflict of Interest: No Conflict of Interest

Disclosure of grants or other funding: No grants or funds to be disclosed

REFERENCES
Original Article

Survival of Skin Cancer Patients Diagnosed between 2001 and 2008 in Central Iran

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¹Dermatology Department, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
²Shahid Sadoughi University of Medical Sciences, Yazd, Iran

ABSTRACT

Objective: This study aims to evaluate the frequency and five-year survival rates of skin cancer patients at medical facilities in Yazd, Iran within an eight year period.

Design: Retrospective, analytic survival study

Setting: Dermatology Department, Shahid Sadooghi Hospital, Yazd, Iran

Subjects: One thousand two hundred and sixteen patients who had visited specialized medical centers in Yazd province, central Iran, diagnosed with skin cancer, between the year 2001 - 2008

Intervention(s): Required relevant data were collected from patients files and analyzed

Main outcome measure(s): Mortality

Results: This study, which included 701 male and 515 female patients, showed that overall affliction rates were higher in males (57.6%) than females (42.4%), and its relative distribution is most frequently observed in patients between the ages of 50 - 80 years.

The highest number of skin cancer cases was reported amongst agricultural workers (36.3%), with the most common cancer type as Basal Cell Carcinoma (BCC) (72.4%), and facial regions were the most commonly affected areas (60.9%).

The five-year survival rates were observed to be BCC (93.9%), Squamous Cell Carcinoma (SCC) (92.5%) and Malignant Melanoma (MM) (75.2%).

Females showed a lower mortality rate than males, and the five-year survival rate decreased inversely with increases in patients’ ages. Highest survival rates were observed among office workers and housewives, whereas lowest survival rates were seen among hand-workers and farmers.

Conclusion: Exposure to sunlight is the most important cause of various skin cancer types. Better training and education is recommended.

KEYWORDS: basal cell carcinoma, cancer, human malignancies, malignant melanoma, squamous cell carcinoma

INTRODUCTION

Skin cancer is the most common cancer globally, which is associated with high disability and relatively low mortality rates, with the exception of Melanoma which is associated with high mortality rates. This type of cancer, is most commonly observed in Europe, America, Australia and other regions where the population consists mainly of people with light skin and blue eyes[1-3].

Skin cancer is mainly seen in three types: Basal Cell Carcinoma (BCC), Squamous Cell Carcinoma (SCC) and Malignant Melanoma (MM)[3], and is rarely observed in other cells such as immune cells, skin attachments, vascular tissue or metastatic.

The number of skin cancer cases has increased during recent decades, and the most important factors in this regard are exposure to sunlight and skin type. In addition, increased outdoors activities without proper clothing, more travel to coastal areas and decreasing ozone layer protection are associated with higher rates of skin cancer[3, 4].

Non-Melanoma skin cancers are the most common cancer types in humans, which comprises about 30 - 40% of all human malignancies.

Non-Melanoma skin cancers in the USA within the past decade show an increase of 15 - 20% over the previous decade. Melanoma rates also show an increase of 50% compared to each preceding decade[1-3].

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Malignant Melanoma comes mainly from skin Melanocytes, and although it is generally less frequent than non-Melanoma cancers, its numbers have increased within the past decade, and it is now considered a common cancer.

More importantly, over 75% of mortalities caused by skin cancer are due to Melanoma. Any possible decrease in mortality rates is a direct result of early diagnosis [6].

Occurrence of skin cancers in older white men is higher than other groups, and although there are many genetic factors involved in affliction to skin cancers, the most important factors are exposure to sunlight and skin type [6].

BCC and SCC are not accompanied by high mortality rates. SCC is more aggressive, which metastasizes in more than 15% of cases. However, BCC rarely metastasizes or causes fatalities, but it can spread and cause damages locally [6].

Due to the fact that reports of various skin cancers and related fatalities are on the rise, the present study attempts to evaluate the five-year survival rates of patients with skin cancer in Yazd province.

SUBJECTS AND METHODS

This study has been conducted through survival descriptive method and encompasses all patients who visited specialized medical centers who had been diagnosed with skin cancer between the years 2001-2008 in Yazd-Iran, which is a referral center for many other cities in central Iran. Available epidemiologic patient information (age, occupation, sex, place of residence and treatment type) were recorded in a questionnaire. Then, patients and their families were contacted in person or by telephone to record their current status.

In cases where the patient had died, their file and the cause of death were considered, and patients who had died as a result of skin cancer or related complications were recorded. In certain cases where available patient information was incomplete, the required information was obtained through local medical centers and from government statistics, as well as cemetery records. There were no exclusion criteria involved, and all the information were collected by one observer. The statistical software used was (SPSS 11.0 for Windows, Chicago, IL, USA), and the statistical method was chi-square, Kaplan Meier and Cox Regression.

RESULTS

According to available file data, Yazd province medical centers recorded 1216 skin cancer patients during this period, of which 57.6% were male and 42.4% female. By referring to records available from the Government Records Office and matching patient information with these records, 421 cases of patient deaths were discovered of whom 46 patients had died due to skin cancer and related complications.

According to the analysis shown in Table 1, highest frequency of skin cancer was BCC (72.4%), SCC (23%), MM (2.3%) and all other cancers 2.3 %.

As Table 1 shows, men made up the majority of cases (57.6%) as compared to women (42.4%), or roughly a ratio of 4 - 3.

Table 1: Prevalence of skin cancers by gender in the study population

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>N (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCC</td>
<td>Male 506 (41.6)</td>
<td>701 (57.6)</td>
</tr>
<tr>
<td></td>
<td>Female 374 (30.8)</td>
<td>515 (42.4)</td>
</tr>
<tr>
<td>SCC</td>
<td>Male 62 (13.3)</td>
<td>17 (1.4)</td>
</tr>
<tr>
<td></td>
<td>Female 118 (9.7)</td>
<td>11 (0.9)</td>
</tr>
<tr>
<td>MM</td>
<td>Male 17 (1.4)</td>
<td>16 (1.3)</td>
</tr>
<tr>
<td></td>
<td>Female 11 (0.9)</td>
<td>12 (1.1)</td>
</tr>
<tr>
<td>Other</td>
<td>Male 28 (2.3)</td>
<td>28 (2.3)</td>
</tr>
<tr>
<td></td>
<td>Female 28 (2.3)</td>
<td>28 (2.3)</td>
</tr>
<tr>
<td>Total</td>
<td>Male 880 (72.4)</td>
<td>1216 (100)</td>
</tr>
<tr>
<td></td>
<td>Female 280 (23)</td>
<td>118 (9.7)</td>
</tr>
</tbody>
</table>

BCC = Basal cell carcinoma, SCC = Squamous cell carcinoma, MM = Malignant melanoma

With respect to age, the highest number of cases of BCC and SCC were recorded among patients in their 60's and Melanoma in patients in their 50's (Table 2).

Table 2: Prevalence of skin cancers by age group in the study population

<table>
<thead>
<tr>
<th>Age group (year)</th>
<th>BCC N (%)</th>
<th>SCC N (%)</th>
<th>MM N (%)</th>
<th>Other N (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-19</td>
<td>88 (10%)</td>
<td>18 (6.4)</td>
<td>2 (7.1)</td>
<td>1 (7.1)</td>
<td>110 (9)</td>
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<tr>
<td>20-24</td>
<td>140 (15.9)</td>
<td>48 (17)</td>
<td>4 (14.3)</td>
<td>6 (21.4)</td>
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<td>25-29</td>
<td>181 (20.6)</td>
<td>50 (17.8)</td>
<td>8 (28.6)</td>
<td>6 (21.4)</td>
<td>245 (20.1)</td>
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<tr>
<td>30-34</td>
<td>219 (24.9)</td>
<td>89 (31.8)</td>
<td>3 (10.7)</td>
<td>7 (25)</td>
<td>318 (26.2)</td>
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<tr>
<td>35-39</td>
<td>174 (19.8)</td>
<td>44 (15.7)</td>
<td>6 (21.4)</td>
<td>4 (14.3)</td>
<td>228 (18.8)</td>
</tr>
<tr>
<td>40-44</td>
<td>78 (8.9)</td>
<td>31 (11)</td>
<td>5 (17.8)</td>
<td>3 (10.7)</td>
<td>117 (9.6)</td>
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<tr>
<td>Total</td>
<td>880 (72.4)</td>
<td>280 (23)</td>
<td>28 (2.3)</td>
<td>28 (2.3)</td>
<td>1216 (100)</td>
</tr>
</tbody>
</table>

BCC = Basal cell carcinoma, SCC = Squamous cell carcinoma, MM = Malignant melanoma

With respect to occupation, BCC was found to be more common among farmers (74.6%), SCC among housewives (26.3%) and Melanoma among laborers (3.5%) (Table 3).

Table 3: Prevalence of skin cancers by occupation in the study population

<table>
<thead>
<tr>
<th>Occupation</th>
<th>BCC N (%)</th>
<th>SCC N (%)</th>
<th>MM N (%)</th>
<th>Other N (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmer</td>
<td>330 (74.6)</td>
<td>92 (20.8)</td>
<td>10 (2.3)</td>
<td>10 (2.3)</td>
<td>242 (56.3)</td>
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<td>Office worker</td>
<td>101 (72.7)</td>
<td>27 (19.4)</td>
<td>4 (2.9)</td>
<td>7 (5)</td>
<td>139 (11.4)</td>
</tr>
<tr>
<td>Homemaker</td>
<td>253 (69.3)</td>
<td>96 (26.3)</td>
<td>8 (2.2)</td>
<td>8 (2.2)</td>
<td>363 (30)</td>
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<tr>
<td>Laborer</td>
<td>99 (68.7)</td>
<td>37 (25.7)</td>
<td>5 (3.5)</td>
<td>3 (2.1)</td>
<td>144 (11.9)</td>
</tr>
<tr>
<td>Undefined</td>
<td>97 (77)</td>
<td>28 (22)</td>
<td>1 (1)</td>
<td>0 (0)</td>
<td>126 (10.4)</td>
</tr>
<tr>
<td>Total</td>
<td>880 (72.4)</td>
<td>280 (23)</td>
<td>28 (2.3)</td>
<td>28 (2.3)</td>
<td>1216 (100)</td>
</tr>
</tbody>
</table>

BCC = Basal cell carcinoma, SCC = Squamous cell carcinoma, MM = Malignant melanoma
Table 4: Prevalence of skin cancers by site of lesion in the study population

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Cancer Type</th>
<th>BCC N (%)</th>
<th>SCC N (%)</th>
<th>MM N (%)</th>
<th>Other N (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face</td>
<td></td>
<td>566 (46.6)</td>
<td>152 (12.5)</td>
<td>11 (0.9)</td>
<td>740 (60.9)</td>
<td></td>
</tr>
<tr>
<td>Head</td>
<td></td>
<td>238 (19.6)</td>
<td>94 (7.7)</td>
<td>7 (0.6)</td>
<td>345 (28.4)</td>
<td></td>
</tr>
<tr>
<td>Extremities</td>
<td></td>
<td>44 (3.6)</td>
<td>13 (1.1)</td>
<td>7 (0.6)</td>
<td>71 (5.9)</td>
<td></td>
</tr>
<tr>
<td>Other sites</td>
<td></td>
<td>32 (2.6)</td>
<td>21 (1.7)</td>
<td>3 (0.2)</td>
<td>60 (4.8)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>880 (72.4)</td>
<td>280 (23)</td>
<td>28 (2.3)</td>
<td>1216 (100)</td>
<td></td>
</tr>
</tbody>
</table>

BCC = Basal cell carcinoma, SCC = Squamous cell carcinoma, MM = Malignant melanoma

Table 4 shows that the highest occurrence of above mentioned cancers had been on facial regions (60.9%). The survival rate of skin cancer patients was analyzed for consecutive years, and results are demonstrated in Table 5; accordingly, BCC (93.9%) shows the highest probability of five-year survival, followed by SCC (92.5%) and Melanoma (75.2%).

The average five-year survival rate among the studied population (Table 6) shows that women generally enjoy a higher survival rate than men. The average five-year survival rate according to age (Table 7), shows the lowest survival rate among patients above 80 years old, and the highest survival rate among patients 40 years of age.

It is worth noting that as shown in Table 8, the highest survival rates were amongst office workers with BCC (97.3%), SCC amongst farmers (96%) and laborers had the lowest survival rates.

**DISCUSSION**
This study covers 1216 patients, 57.6% male and 42.4% female diagnosed with various skin cancers. Ratio of male to female patients was 1.36 to 1 or roughly

### Table 5: Mean survival of the patients in five consecutive years according to type of cancer

<table>
<thead>
<tr>
<th>Period</th>
<th>MM N</th>
<th>MM Mean</th>
<th>MM SE</th>
<th>SCC N</th>
<th>SCC Mean</th>
<th>SCC SE</th>
<th>MM N</th>
<th>MM Mean</th>
<th>MM SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>First year</td>
<td>877</td>
<td>99.1</td>
<td>0.005</td>
<td>278</td>
<td>98.5</td>
<td>0.007</td>
<td>26</td>
<td>91.7</td>
<td>0.011</td>
</tr>
<tr>
<td>Second year</td>
<td>872</td>
<td>97.9</td>
<td>0.011</td>
<td>275</td>
<td>96.9</td>
<td>0.013</td>
<td>25</td>
<td>87.5</td>
<td>0.017</td>
</tr>
<tr>
<td>Third year</td>
<td>865</td>
<td>96.6</td>
<td>0.016</td>
<td>271</td>
<td>94.8</td>
<td>0.019</td>
<td>24</td>
<td>83.6</td>
<td>0.021</td>
</tr>
<tr>
<td>Fourth year</td>
<td>860</td>
<td>95.5</td>
<td>0.022</td>
<td>268</td>
<td>93.4</td>
<td>0.023</td>
<td>23</td>
<td>79.3</td>
<td>0.028</td>
</tr>
<tr>
<td>Fifth year</td>
<td>853</td>
<td>93.9</td>
<td>0.027</td>
<td>267</td>
<td>92.5</td>
<td>0.029</td>
<td>22</td>
<td>75.2</td>
<td>0.033</td>
</tr>
</tbody>
</table>

Mean are presented as %. SE = Standard Error, p-value <0.0001, BCC = Basal Cell Carcinoma, SCC = Squamous Cell Carcinoma, MM = Malignant Melanoma

### Table 6: Mean survival of different types of cancer according to gender of the patients

<table>
<thead>
<tr>
<th>Gender</th>
<th>MM N</th>
<th>MM Mean</th>
<th>MM SE</th>
<th>SCC N</th>
<th>SCC Mean</th>
<th>SCC SE</th>
<th>MM N</th>
<th>MM Mean</th>
<th>MM SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>489</td>
<td>96.3</td>
<td>0.003</td>
<td>154</td>
<td>98.5</td>
<td>0.005</td>
<td>13</td>
<td>76.3</td>
<td>0.010</td>
</tr>
<tr>
<td>Female</td>
<td>364</td>
<td>96.9</td>
<td>0.004</td>
<td>113</td>
<td>96.9</td>
<td>0.006</td>
<td>9</td>
<td>80.5</td>
<td>0.013</td>
</tr>
</tbody>
</table>

Mean are presented as %. SE = Standard Error, p-value = 0.001, BCC = Basal Cell Carcinoma, SCC = Squamous Cell Carcinoma, MM = Malignant Melanoma

### Table 7: Mean survival of different types of cancer according to age groups of the patients.

<table>
<thead>
<tr>
<th>Age group (year)</th>
<th>MM N</th>
<th>MM Mean</th>
<th>MM SE</th>
<th>SCC N</th>
<th>SCC Mean</th>
<th>SCC SE</th>
<th>MM N</th>
<th>MM Mean</th>
<th>MM SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 40</td>
<td>87</td>
<td>98.5</td>
<td>0.002</td>
<td>17</td>
<td>93.9</td>
<td>0.005</td>
<td>2</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>40 - 49</td>
<td>138</td>
<td>97.8</td>
<td>0.006</td>
<td>46</td>
<td>94.9</td>
<td>0.009</td>
<td>3</td>
<td>73.9</td>
<td>0.012</td>
</tr>
<tr>
<td>50 - 59</td>
<td>176</td>
<td>96.1</td>
<td>0.010</td>
<td>48</td>
<td>94.7</td>
<td>0.013</td>
<td>6</td>
<td>73.1</td>
<td>0.019</td>
</tr>
<tr>
<td>60 - 69</td>
<td>211</td>
<td>94.6</td>
<td>0.017</td>
<td>86</td>
<td>94.5</td>
<td>0.021</td>
<td>2</td>
<td>64.1</td>
<td>0.025</td>
</tr>
<tr>
<td>70 - 79</td>
<td>167</td>
<td>93.6</td>
<td>0.023</td>
<td>42</td>
<td>92.8</td>
<td>0.026</td>
<td>5</td>
<td>80.3</td>
<td>0.031</td>
</tr>
<tr>
<td>≥ 80</td>
<td>74</td>
<td>92.1</td>
<td>0.027</td>
<td>28</td>
<td>87.4</td>
<td>0.030</td>
<td>4</td>
<td>76.4</td>
<td>0.036</td>
</tr>
</tbody>
</table>

Mean are presented as %. SE = Standard Error, p-value <0.0001, BCC = Basal Cell Carcinoma, SCC = Squamous Cell Carcinoma, MM = Malignant Melanoma
4 - 3, which corresponds with data from other studies in Iran. For example, a study conducted in Ahwaz shows a ratio of 1.1 to 1\(^7\), a study of BCC patients in Kerman shows a ratio of 1.6 to 1\(^8\). A 15-year-study of skin cancer from 1987 - 2001 in Yazd province showed more skin cancer in men than women, a ratio of 1.6 to 1\(^9\) and a study in Mashhad reported higher rates of BCC, SCC and MM, respectively 6 to 1, 4 to 1 and 2 to 1\(^10\). These ratios have also been confirmed by studies conducted in other countries\(^{4, 11}\).

The reason for higher male afflictions can be due to more regular activities outdoors under the sun, or more contact with carcinogenic materials\(^{4, 12}\). Evaluation of the frequency distribution of various skin cancers in this study shows BCC patients (72.4%), SCC patients (23%) and MM (2.3%) as the highest number of cases respectively. These ratios correspond with data from other countries, such as similar studies conducted in the USA\(^{1, 2}\).

Additionally, studies conducted in other Iranian cities show similar results; for example, Mashhad, BCC 57.7%, SCC 44% and Melanoma 3.4%\(^{10}\); Hamadan, BCC 59%, SCC 29% and MM 4.5%\(^{13}\). Generally, studies conducted in Iran, including the present study, show a lower rate for Melanoma compared to other skin cancers; which points to skin tone and dressing habits of white people in western countries as the cause of higher Melanoma rates amongst those populations.

As has been reported by studies from other countries, the highest occurrence rate is observed in Australia (56 new cases per year per 100,000 in men; and 43 new cases per year per 100,000 in women)\(^{14}\). This frequency distribution in the USA is 14 for men and 11.33 among women\(^{15}\), and between 5 - 15 cases in northern Europe\(^{16, 17}\). The lowest rates are from the Mediterranean countries (about 5 – 7 new cases per 100,000 inhabitants per year)\(^{17}\).

Regarding regions of skin affliction, data from this study shows the highest frequency for all skin cancer types in the facial regions (60.9%), which corresponds with other studies, such as Hamadan 61.2% \(^{13}\) and Kerman 77%\(^8\). In the Yazd study, facial area lesions alone comprise 71.7 percent of all cases\(^9\).

The Mashhad study reported that 93% of BCC tumors and 74% of SCC cases were in the face and neck regions, and lower extremities were the most common regions for occurrence of Melanoma\(^{16}\). In the Ahwaz study, most cases of Melanoma were observed in lower extremities\(^7\).

A study conducted in Spain showed most cases of Melanoma on the back in men and on lower extremities in women\(^{18}\), which is inconsistent from our findings and could be due to certain dress customs in the studied regions.

Studies of five-year survival rates are less available for BCC and SCC, which is possibly due to their better survival rates\(^{2, 19}\); however, many studies have focused on MM.

A study conducted between 2005 - 2009 in the UK, shows one-year survival rates in cases of MM in men as 96%, and the five-year rate as 84%. For women, those ratios were reported as 98% and 92%\(^{20}\). The total survival rate in that study was higher than the present study, but the ratio of fatalities among men and women was similar. Five-year survival of MM in Yazd was reported 76.3% and 80.5% in men and women respectively\(^{21}\).

Other studies in Wales, Scotland and northern British islands show similar results as the UK study\(^{22-24}\).

A US study also reports similar results as above\(^{21}\) and a difference between men and women may be due to differences in thickness of tumors in men and women\(^{25}\). It is important to note that survival depends on many factors such as depth of tumor, metastasis, etc., which have not been considered in the present study.

Regarding the patient age factor, various studies confirm the results of the present study\(^{2, 2, 23}\), which could be due to the better general health of younger patients, earlier diagnosis or better response to treatment among younger patients.

**CONCLUSION**

This study demonstrated that skin cancer is more common and more dangerous among older men, laborers and farmers. Because exposure to the sun’s ultraviolet rays is the most important and most avoidable cause of skin cancers, all people should pay close attention to protecting their skin through the use of sun blockers, avoiding exposure to sunlight, especially during high intensity hours, and wearing suitable clothing. Relevant organizations and government departments must also increase their efforts regarding educational programs to teach and encourage people about preventive measures. Also, any suspicious case must be referred to specialists as soon as possible.

**REFERENCES**


Original Article

Knowledge, Attitude, and Self-Use of Complementary and Alternative Medicine among Students of Health Sciences in Kuwait

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Department of Community Medicine and Behavioral Sciences, Faculty of Medicine, Kuwait University, Kuwait

Kuwait Medical Journal 2016; 48 (3): 207 - 214

ABSTRACT

Objectives: Complementary and alternative medicine (CAM) is a category of medicine that includes a variety of treatment approaches that fall outside the realm of conventional medicine. Since current students in different fields of health sciences constitute the future health care professionals, this study was aimed at assessing the knowledge, attitudes, and self-use of CAM among university students in health sciences, including medicine, pharmacy, dentistry, and allied health in Kuwait.

Design: Cross-sectional study

Setting: Four faculties of the Kuwait University including Medicine, Pharmacy, Dentistry, and Allied Health

Subjects: Students, aged 16 - 32 years, enrolled in the faculties of Medicine, Pharmacy, Dentistry, and Allied Health Sciences under the Health Sciences Center, Kuwait University, Kuwait

Intervention: Students were invited to fill a self-administered pretested questionnaire.

Main outcome measure(s): University students' knowledge, attitudes, and self-use of CAM

Results: Majority of the study participants were young adults aged 20.6 years (SD = 2.1 years). More than 90% of participants had knowledge about meditation, massage, herbal medicine, and blood cupping, whereas reported self-use for these modalities were 52%, 64%, 64%, and 5%, respectively. The least knowledge was for homeopath knowledge scores of CAM compared to students from other faculties (p <0.001).

Conclusion: A high proportion of students from health sciences had knowledge about CAM, although students from medical faculty had the highest knowledge scores. Several CAM modalities including herbal medicine, massage, meditation, and spiritual therapy were used by the students.

KEY WORDS: healthcare, holistic medicine, natural medicine, non conventional medicine, self-use

INTRODUCTION

According to World Health Organization, complementary and alternative medicine (CAM) is defined as a broad set of health-care practices that are not integrated into a country’s dominant health care system[1]. Other terms that are also used to describe this modality of treatment include ‘natural medicine’, ‘non-conventional medicine’, ‘traditional medicine’ and ‘holistic medicine’. CAM includes a variety of different therapies, such as herbal therapy, acupuncture, meditation, and spirituality. It is important to understand the extent of incorporation of CAM into health system. WHO estimated that most people in developing nations receive the bulk of their health care from traditional and indigenous medicine[1].

A study in urban Nigeria showed that CAM use was common in male hypertensive subjects. The belief in supernatural causes of hypertension was one of the independent predictors of CAM use in this population[2]. CAM has long been practiced in

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Bangladesh and it is estimated that 70 - 75% of the village population of the country still use traditional medicine for the management of their health problems. Broadly speaking, four types of CAM are primarily practiced in Bangladesh, namely herbal, homeopathy, religious, and spiritual methods [3]. Acupuncture is one of the traditional Chinese practices of medicine widely used in China and some other Asian countries. A recent review showed the use of acupuncture to be a useful adjunct therapy for in vitro fertilization outcome [4]. Of the 12 randomized studies cited in that report, eight were successful in improving pregnancy rates or fertilization rate after providing acupuncture therapy. For people with inflammatory bowel disease, aloe vera, a succulent herbal medicine plant, is widely used topically for pain relief. People with mild-to-moderate ulcerative colitis also drink aloe vera juice to reduce symptoms [5]. Interestingly enough, a European survey concluded that herbal medicines and remedies were the most commonly used CAM therapies, together with homeopathy, vitamins/minerals, medicinal teas, spiritual therapies, and relaxation techniques in patients with cancer [6].

Because of its widespread use, it is important to ascertain prevalence, public awareness, knowledge, and misconceptions about CAM. A cross-sectional study among undergraduate pharmacy students in Sierra Leone indicated that all the study people (n = 90) were knowledgeable about and used at least one of the listed CAM modalities [7]. In a survey of medical students in California using a CAM Health Belief questionnaire, 73.5% of students reported use of at least one CAM modality (excluding vitamins/mineral supplements), and 54% used two or more modalities [8]. The modalities most frequently used were massage, meditation, yoga, relaxation, and spirituality. A survey conducted at Mayo Clinic showed that physicians felt knowledgeable and comfortable counseling patients about only 3 of 13 listed treatments or techniques of CAM and about 2 of 10 listed herbs [9]. Another study in Minnesota revealed that 90% of the faculty and students in medicine, nursing, and pharmacy expressed their views that clinical care should integrate the best of CAM practices which conventional medicine could benefit from [10]. In Singapore, 555 medical students completed a questionnaire that showed that a significant number of students had erroneous knowledge about CAM. Lack of scientific support was considered to be the main barrier to implement CAM; however, attitudes toward CAM were positive [11]. In Pakistan, 198 medical students believed that CAM modalities are useful; however, they lacked the knowledge about their safety and efficacy [12].

A study among 943 medical students in Turkey showed that the most well-known methods used were herbal treatment (81.2%), acupuncture (80.8%), hypnosis (78.8%), body-based practices including massage (77%) and meditation (65.2%) [13]. They believed that knowledge of CAM would be useful, but CAM practitioners need to be medically qualified. CAM is also an important part of treatment in the daily lives of people in the Middle East. Medical students in Saudi Arabia used prayers, herbal products, massage, nutritional supplements and acupuncture as the most common CAM modalities [14]. In Kuwait, little is known about the prevalence of CAM usage [15]. A small-scale cross-sectional study among 88 general practitioners in Farwaniya, Kuwait revealed that the majority of the physicians (78.4%) did not feel qualified to make use of CAM because of their poor knowledge about it [16].

As the public awareness has increased and usage of CAM modalities have become more popular around the world, it is vital for health professionals to improve their knowledge and understanding of CAM. The aim of our study was to evaluate the gap in the awareness toward CAM among health professional students since they are the future foundation of the health care system. Our specific objectives were to: 1) assess the knowledge, attitude and self-use of CAM; and 2) compare these factors among medical, pharmacy, dental, and allied health students.

SUBJECTS AND METHODS

Study design

A cross-sectional survey was conducted among students at Kuwait University from March to April 2015. Students, aged 16 - 32 years, enrolled at the Health Science Center, Kuwait University in the faculties of medicine, pharmacy, dentistry, and allied health were eligible.

Ethical consideration

The study protocol was approved by the Human Ethics Committee of Health Sciences Center, Kuwait University and conformed to the ethical standards of the Helsinki declaration. Administrative approvals were taken from respective Deans of the faculties of Medicine, Pharmacy, Dentistry, and Allied Health Sciences. An informed consent was taken before enrollment of subjects.

Sample size estimation

Based on an earlier report from Kuwait [17], the expected prevalence rate of knowledge about CAM was 33%. With a 5% precision and 95% confidence, the required sample size was 390.

Study questionnaire

The content validity of the questionnaire was reviewed by a panel of three local scientists.
Information relevant to this study were gathered by literature search using several key words, such as “Complementary and Alternative Medicine” “Integrative Medicine”, “knowledge”, “attitude”, “surveys” and “medical students”. We also reviewed one survey instrument used by medical students in a previously published study[8]. The questionnaire included socio-demographic variables such as age, nationality, parents’ educational level, income, governorate (administrative unit), name of faculty, and year of schooling in the faculty. The demographic variables except age were recorded as categorical variables. The major variables of interest were knowledge, attitudes, and self-use of CAM, which included close-ended questions on 10 modalities of CAM. Answers to these questions were recorded as “yes”, “no”, and “do not know”. In addition, there were nine Likert-scale questions on a 5-point scale (strongly disagree, disagree, neutral, agree, and strongly agree) to measure attitudes. The questionnaire was pre-tested for content, construct of the question, readability, comprehension, and accuracy among 10 students, and modifications were made accordingly.

Data collection
The eligible students were contacted and explained the purpose of the research. Those who gave written consent to take part in the study were handed out the questionnaires and were asked to return them anonymously after being completed. Data were collected among the eligible students by convenience sampling, on a first-come first-serve basis. A team of six members was divided into three groups to collect data.

Data analysis
Data were entered, and analyzed using SPSS for windows version 22 (Chicago, IL). Years of education of students were grouped into three classes: 1st – 2nd year (n = 414); 3rd - 4th year (n = 248); and 5th - 7th (n = 210). Knowledge, self-use and attitude towards CAM were each given a score based on the available information (1 point for “yes” and 0 point for “no or unknown” answer), and a composite score was calculated.

Descriptive statistics for all variables across all respondents were computed for the variables to assess the distribution of the data. Demographic variables were presented as percentage for categorical variables and mean (SD) for quantitative variables. Knowledge scores of students were compared among faculties and year of schooling using one-way ANOVA and Tukey’s HSD. Qualitative variables were compared among the groups by using Chi-square test. Statistical significance was accepted at p-value of ≤0.05.

RESULTS
Socio-demographic data
A total of 944 students were approached and 874 agreed to participate, yielding a participation rate of 92.6%. Table 1 shows the socio-demographic characteristics of the study subjects. The mean age of the population was 20.59 years (SD = 2.08). Majority of the study participants were females (79.6%), and were Kuwaitis (85.8%). The proportion of students enrolled was highest for the medical faculty (49.4%), followed by allied health sciences (28.9%), pharmacy (11.6%), and dentistry (10.1%). About 47.4% of the students were from year 1 and 2, 28.4% were from year 3 and 4, and 24% were from year 5 - 7. Majority of the students (57.9%) reported a family monthly income of >2000 KD (~US $6,600) and more than 55% reported parents having a bachelors or higher degree of education.

Table 1: Socio-demographic characteristics of 874 participants

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>20.59 ± 2.075</td>
</tr>
<tr>
<td>Female gender</td>
<td>696 (79.6)</td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
</tr>
<tr>
<td>Kuwaiti</td>
<td>750 (85.8)</td>
</tr>
<tr>
<td>Non-Kuwaiti</td>
<td>120 (13.7)</td>
</tr>
<tr>
<td>Faculty</td>
<td></td>
</tr>
<tr>
<td>Medicine</td>
<td>432 (49.4)</td>
</tr>
<tr>
<td>Allied Health Sciences</td>
<td>253 (28.9)</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>101 (11.6)</td>
</tr>
<tr>
<td>Dentistry</td>
<td>88 (10.1)</td>
</tr>
<tr>
<td>Class enrollment</td>
<td></td>
</tr>
<tr>
<td>1st - 2nd year</td>
<td>414 (47.4)</td>
</tr>
<tr>
<td>3rd - 4th year</td>
<td>248 (28.4)</td>
</tr>
<tr>
<td>5th - 7th year</td>
<td>210 (24.0)</td>
</tr>
<tr>
<td>Father’s education</td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>61 (7.0)</td>
</tr>
<tr>
<td>High School</td>
<td>142 (16.2)</td>
</tr>
<tr>
<td>Diploma</td>
<td>145 (16.6)</td>
</tr>
<tr>
<td>Bachelors or Higher</td>
<td>520 (59.5)</td>
</tr>
<tr>
<td>Mother’s education</td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>65 (7.4)</td>
</tr>
<tr>
<td>High School</td>
<td>134 (15.3)</td>
</tr>
<tr>
<td>Diploma</td>
<td>166 (19.0)</td>
</tr>
<tr>
<td>Bachelors or Higher</td>
<td>506 (57.9)</td>
</tr>
<tr>
<td>Family’s monthly income in K.D.</td>
<td></td>
</tr>
<tr>
<td>&lt; 1000</td>
<td>59 (6.8)</td>
</tr>
<tr>
<td>1000 - &lt;1500</td>
<td>141 (16.1)</td>
</tr>
<tr>
<td>1500 - &lt;2000</td>
<td>146 (16.7)</td>
</tr>
<tr>
<td>≥ 2000</td>
<td>506 (57.9)</td>
</tr>
</tbody>
</table>

1 KD (Kuwaiti Dinar) = US $ 3.3 (Approx – as on Nov 2015)

Knowledge about CAM
Knowledge scores about different modalities of CAM ranged from 2 – 11 points, with a mean of 8.71 (SD = 1.54). Table 2 shows that the knowledge scores of medical students (9.1 ± 1.4) were significantly higher than the scores of pharmacy students (8.2 ± 1.5) and the scores of allied health students (8.2 ± 1.7) (p < 0.001 for both) but not significantly different from the scores of dentistry students (8.9 ± 1.4). Similarly, students
Table 2: Comparison of knowledge scores among students of different faculties

<table>
<thead>
<tr>
<th>Faculty</th>
<th>No. (%)</th>
<th>Knowledge score Range (2 – 11) Mean ± SD</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine</td>
<td>414 (47.3)</td>
<td>9.10 ± 1.39a</td>
<td>a vs c &lt; 0.001</td>
</tr>
<tr>
<td>Dentistry</td>
<td>85 (9.7)</td>
<td>8.93 ± 1.41b</td>
<td>a vs d &lt; 0.001</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>96 (10.9)</td>
<td>8.16 ± 1.47c</td>
<td>b vs c = 0.003</td>
</tr>
<tr>
<td>Allied Health Sciences</td>
<td>228 (26.1)</td>
<td>8.16 ± 1.65d</td>
<td>b vs d &lt; 0.001</td>
</tr>
</tbody>
</table>
*One Way ANOVA; Tukey’s HSD, vs = versus

Table 3: Comparison of knowledge scores by year of schooling

<table>
<thead>
<tr>
<th>Class enrollment</th>
<th>No. (%)</th>
<th>Knowledge score Range (2 – 11) Mean ± SD</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st - 2nd years</td>
<td>385 (44.1)</td>
<td>8.31 ± 1.62a</td>
<td>a vs b &lt; 0.001</td>
</tr>
<tr>
<td>3rd - 4th years</td>
<td>229 (26.2)</td>
<td>9.07 ± 1.48b</td>
<td>a vs c &lt; 0.001</td>
</tr>
<tr>
<td>5th - 7th years</td>
<td>209 (24.0)</td>
<td>9.06 ± 1.47c</td>
<td></td>
</tr>
</tbody>
</table>
*One Way ANOVA; Tukey’s HSD, vs = versus

Table 3 shows the relationship between knowledge scores and years of schooling. Students, irrespective of their faculty of education, who were in their higher level of classes (3rd year to 7th year) differed significantly in their knowledge scores from those who were in their earlier years of classes (1st and 2nd year) (p <0.001). Internet (68.8%) was the most commonly used source to obtain knowledge about CAM, followed by family and friends (45.7%).

Fig 1 shows the knowledge of students of different faculties about the various modalities of CAM. More than 90% had knowledge about meditation, herbal medicine, and blood cupping, with no significant differences among these three areas of CAM between the students of different faculties. The least knowledge was observed for homeopath medicine (21%) and chiropractic medicine (54%). There was no trend in higher knowledge in the modalities of CAM in any particular group of students based on their faculty of education or subject of specialty. For example, a significantly higher proportion of medical students than dentistry students had knowledge in the field of hypnosis (94% vs. 80%, respectively; p <0.001). The proportion of medical students with knowledge about chiropractic medicine was also significantly higher.

Fig 1: Knowledge of participants on different modalities of complementary and alternative medicine. The figures represent percentages.
Complementary and alternative therapies are a threat to public health.

Complementary and alternative therapies that are not tested in a scientifically recognized manner should be discouraged.

Complementary and alternative therapies are essential because health and vital force obtained from CAM.

Complementary and alternative therapies include ideas and methods from therapeutic powers.

Most complementary and alternative therapies stimulate the body’s natural therapeutic powers.

Complementary and alternative therapies are a threat to public health.

Effects of complementary and alternative therapies are usually the results of the placebo effect.

Table 4: Attitude of health sciences students towards complementary and alternative medicine

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The physical and mental health is maintained by an underlying energy of</td>
<td>75 (8.6)</td>
<td>164 (18.8)</td>
<td>416 (47.6)</td>
<td>174 (19.9)</td>
<td>26 (3.0)</td>
</tr>
<tr>
<td>vital force obtained from CAM.</td>
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</tr>
<tr>
<td>Complementary and alternative therapies are essential because health and</td>
<td>75 (8.6)</td>
<td>125 (14.3)</td>
<td>321 (36.7)</td>
<td>283 (32.4)</td>
<td>52 (5.9)</td>
</tr>
<tr>
<td>disease are a reflection of balance between positive life enhancing forces</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and negative destructive forces.</td>
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</tr>
<tr>
<td>The body is essentially self-healing and the task of a health care provider</td>
<td>71 (8.1)</td>
<td>158 (18.1)</td>
<td>312 (35.7)</td>
<td>261 (29.9)</td>
<td>52 (5.9)</td>
</tr>
<tr>
<td>is to assist in the healing process using CAM.</td>
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<tr>
<td>A patient’s expectations health beliefs about CAM should be integrated</td>
<td>38 (4.3)</td>
<td>84 (9.6)</td>
<td>340 (38.9)</td>
<td>330 (37.8)</td>
<td>57 (6.5)</td>
</tr>
<tr>
<td>into the patient care process.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Majority of subjects (78.3%) believed that CAM</td>
<td>42 (4.8)</td>
<td>89 (10.2)</td>
<td>390 (44.6)</td>
<td>278 (31.8)</td>
<td>53 (6.1)</td>
</tr>
<tr>
<td>is useful and were willing to recommend some of CAM modalities.</td>
<td></td>
<td></td>
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<tr>
<td>Most commonly used modalities among students were herbal (62%), massage</td>
<td>32 (3.7)</td>
<td>76 (8.7)</td>
<td>359 (41.1)</td>
<td>335 (38.3)</td>
<td>48 (5.5)</td>
</tr>
<tr>
<td>(62%), meditation/yoga (51%), and spirituality/prayer (49%).</td>
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<tr>
<td>In addition, 69% of participants reported having a family member or a</td>
<td>59 (6.8)</td>
<td>119 (13.6)</td>
<td>225 (25.7)</td>
<td>238 (27.2)</td>
<td>210 (24.0)</td>
</tr>
<tr>
<td>friend using CAM currently.</td>
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<tr>
<td>compared to that of students of allied health (60% vs 45%; <em>p</em> = 0.002).</td>
<td>95 (10.9)</td>
<td>312 (35.7)</td>
<td>289 (33.1)</td>
<td>130 (14.9)</td>
<td>23 (2.6)</td>
</tr>
<tr>
<td>A significantly more dentistry students than allied health students</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>knew about acupuncture (97% vs 78%, respectively; <em>p</em> &lt; 0.001) and</td>
<td>60 (6.9)</td>
<td>151 (17.3)</td>
<td>380 (43.5)</td>
<td>208 (23.8)</td>
<td>51 (5.8)</td>
</tr>
<tr>
<td>spiritual treatment (97% vs 82%, respectively; <em>p</em> &lt; 0.001), whereas</td>
<td></td>
<td></td>
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<tr>
<td>allied health students were more likely to be informed about martial art</td>
<td></td>
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<tr>
<td>as a mode of treatment of CAM, compared to the dentistry students (87% vs</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>71%, respectively, <em>p</em> = 0.007).</td>
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</tbody>
</table>

DISCUSSION

This study showed that there is a significant association between faculty and level of education of the students with their knowledge score. Students, irrespective of their faculty of education, who were in their higher level of classes (3rd to 7th year) were significantly more knowledgeable compared to those who were in their earlier years of classes (1st and 2nd year) (*p* < 0.001).

In a study done in Ireland, knowledge ratings among health science students were highest for massage (33.2%), and spirituality (32.3%)[17]. Conversely in Germany, medical students felt most familiar with homeopathy (31.7%) and hypnosis (25%)[18]. However, in our study, health science center students heard most about massage (98.7%), meditation / yoga / relaxation/ imagery (98.2%), herbal supplements (96.3%), blood cupping (93.8%) and hypnosis (89.5%). In Wales, the widely known CAM modalities were acupuncture (64%), herbal supplements (38%), and chiropractic (31%)[19], whereas in our study chiropractic (54.2%) and homeopathic medicine (21%) were among the least heard of CAM methods. This may reflect a wide variation in CAM use pattern in different geographic regions.

Similar to our findings, pharmacy students in Malaysia used the internet (69%) and family/friends (63%) as resources to gain knowledge about CAM[20]. In Pakistan, pharmacy students found journals (64%) and the internet (49%) as useful tools[21]. A previous study in Kuwait that included only 250 medical and pharmacy students stated that 33.3% knew about four out of 11 CAM modalities which included herbal products (40.7%), spirituality/prayer (37.1%), massage
The proportion of students having knowledge about CAM was much higher in our study, which may partly be explained by the time difference of the two studies, and partly because of the difference in study populations. For example, in our study, knowledge of all students combining faculties of medicine, dentistry, pharmacy, and allied health showed the following distribution of knowledge: massage - 99%, meditation - 98%, herbal - 96%, blood cupping - 94%, spirituality - 88%, and acupuncture - 88%.

We assessed attitude by interpreting which modality the participants would recommend using for their patients or relatives. Students of health sciences felt more positive in recommending massage (79.8%), meditation / yoga / relaxation / imagery (73.7%), herbal supplements (60.4%), spirituality / prayer (47.8%), and martial arts (45.8%). Our results were somewhat parallel to a study involving medical students in Ireland\cite{17}. Their personal views were positive toward massage (82.8%), meditation / yoga / relaxation / imagery (69%), and spirituality (57.7%), acupuncture (59.6%) and herbalism (48.9%). First year medical students in California, USA, also felt they would recommend some of the same modalities such as massage (73.7%), meditation / yoga / relaxation / imagery (68.4%), spirituality (57.9%) and herbalism (55.8%)\cite{22}.

In terms of self-use, the first five mostly used methods in our study included massage (64.1%), herbal supplements (63.5%), meditation / yoga / relaxation / imagery (51.8%), spirituality / prayer (50.4%), and martial arts (23.2%). The least five modalities used were blood cupping (5.1%), homeopathy (4.4%), chiropractic (3.8%), hypnosis (3.3%), and acupuncture (2.8%). Pharmacy students in Pakistan were mostly using massage (83%), homeopathy (59%) and herbal supplements (58%), which is different from our findings\cite{21}. Medical students in USA used massage (64%) and meditation / yoga / relaxation / imagery...
(54.6%), while our medical participants most often used massage (62.9%), herbal (61.5%) and meditation/yoga/relaxation/imagery (48.6%)\(^{(22)}\).

This was the first study in Kuwait to investigate the knowledge, attitudes, and self-use of CAM across different health professional students. The results presented here were limited by the fact that the data were gathered through self-reported questionnaire. Since the data were cross-sectional, we did not have information about the change of knowledge, attitude, and self-use of CAM modalities in Kuwait. A reasonably large sample size of this study, however, may be considered representative of health sciences students in Kuwait. The response rate of 92.6% was sufficiently high to rule out the chance of selection bias.

CONCLUSIONS
Knowledge of CAM modalities differed between faculty and seniority in class of enrolment of the students. More than half of the students reported self-use of four out of 10 CAM methods and the attitude was generally positive. Health professional students should be better educated and given the opportunity to use evidence-based sources to learn about CAM so that they would be better equipped to advice and help patients in the future.

ACKNOWLEDGMENT
The authors would like to thank the Deans of Faculty of Medicine, Faculty of Dentistry, Faculty of Allied Health for their approval for this project. The authors also thank Maqsood Nazar for his efforts in data analysis.

Conflict of interest: None

REFERENCES


Original Article

The Efficacy of Ten Weeks Prolotherapy as Add-On Therapy in the Treatment of Chronic Low Back Pain

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Kuwait Medical Journal 2016; 48 (3): 215 - 218

ABSTRACT

Objective(s): To investigate the efficacy of prolotherapy in the treatment of chronic low back pain according to patient adherence.

Design: Cross-sectional study conducted during the period October 2010 to December 2012.

Setting: Outpatient clinic of one of the local hospitals in Korea.

Subjects: Thirty-eight participants completed a prescribed treatment of once-a-week prolotherapy of 10 weeks (treatment-completion group, TG). The other 35 participants completed an average of 3.5 prolotherapy sessions only, in combination with conventional therapy (control group, CG).

Intervention(s): Once-a-week prolotherapy sessions in combination with conventional therapies for 10 weeks in TG group, and prolotherapy sessions in combination with conventional therapies and then received conventional therapies only without prolotherapy (control group, CG).

Main outcome measure(s): The scores for Visual Analogue Scale (VAS), Oswesty Disability Index (ODI), and Brief Encounter Psychosocial Instrument (BEPSI-K) were measured at weeks 0, 6, 10, and 24 by self-administered questionnaire.

Results: In the TG, the VAS and BEPSI-K scores tended to decrease gradually over time, while the ODI scores decreased gradually initially, followed by a rapid decrease over the 24 weeks. The pre-post mean gain scores of the VAS and ODI between baseline and week 24 were significantly greater in TG than in CG. The VAS and ODI scores remained unchanged throughout the 24 weeks in CG. Twenty-nine patients (76.3%) in TG and two patients (5.7%) in CG achieved at least a 50% reduction in VAS scores from baseline to 24 weeks.

Conclusion: Prolotherapy may be an efficient and favorable option for treating chronic low back pain in patients with good compliance to therapy.

KEYWORDS: conventional therapy, low back pain, prolotherapy

INTRODUCTION

Lower back pain (LBP) is a common problem faced by an estimated 50 to 80% of adults, at least once in their lifetime[1]. Prolotherapy is an injection-based complementary and alternative medical therapy for chronic LBP (CLBP). The painful, weakened ligaments or tendons are injected with a proliferant solution[2]. Patient adherence is very important for optimal outcomes in ensuring accurate evaluation of the treatment effectiveness. We hypothesized that patients with good adherence would have a better clinical response than patients with poor adherence in prolotherapy of CLBP. We compared the efficacy of ten weeks prolotherapy as add-on therapy in the treatment of CLBP according to patient adherence.

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SUBJECTS AND METHODS
The study was designed as a retrospective chart review. We included outpatients at family medicine for CLBP that did not recover with a trial of exercise, manipulation, and dry needling of trigger points and defined as pain in the lumbar region, sacral region - with or without pain, gluteal regions, or radiation to the lower extremities for ≥ 12 weeks. Subjects were excluded if they had lumbar/sacral radiculopathies or pathological causes, or surgical causes of LB among patients with CLBP. A course of 10 prolotherapy treatments was recommended for all subjects, with the treatments scheduled once a week for 10 weeks. It is allowed to use conventional therapy for relieving chronic low back pain such as medications for pain control (for example, NSAIDs except for narcotics and muscle relaxants). The scores for Visual Analogue Scale (VAS), Oswestry Disability Index (ODI)[3,4], and Brief Encounter Psychosocial Instrument (BEPSI-K) [5] were measured at weeks 0, 6, 10, and 24 for TG and VAS and ODI were measured at weeks 0 and 24 for CG. Clinical success was defined as at least a 50% reduction in VAS scores from baseline to 24 weeks[6]. Questionnaires for CG at 24 weeks were followed up by telephone. The calculated sample size was 33 patients per group for a 80% power to detect a difference in the mean VAS score of 1.2, assuming a standard deviation of 1.7 in the primary outcome variables between the two groups (TG and CG) and an alpha error of 5%, obtained from previous study[7]. There were 76 total subjects (50 women and 26 men) (mean age 52.4 ± 10.9 years). The study population consisted of two groups of patients: 38 completed a prescribed treatment of once-a-week prolotherapy sessions in combination with conventional therapies for 10 weeks (treatment-completion group, TG). The other 35 participants only completed an average of 3.5 prolotherapy sessions in combination with conventional therapies and then received conventional therapies only without prolotherapy (median, 3; range, 1–6) (control group, CG). An initial medical consultation, including a complete history and physical examination, was performed by the skilled prolotherapist with three years of clinical experience to determine if the patient is a candidate for treatments course. If so, side effects, adverse events such as pain exacerbation, allergic reactions, although none classified as serious and expected course of injections were explained, and the patient was asked to sign a procedure consent form including treatment protocol and complication.

Practitioner used a protocol involving injections of 25G 2-inch needle insertion to the ligamentous insertions of the L4-S1 spinous processes, sacrum, and ilium including the iliolumbar ligament, or the sacroiliac ligament. The injection solution formula was a 15% dextrose solution, mixture of prepared from 3 ml of 50% dextrose, 5 ml of normal saline, and 2 ml of 2% lidocaine. One-half milliliter (0.5 ml) of proliferant was injected into tendons or ligaments at bone attachment site where weakness was clinically suspected based on the presence of tenderness with or without jumping sign, and aggravation of pain on exercise[8]. The number of injection sites varied depending on the number of sites with tenderness and the average number of injection sites has been used 15 - 30 times every person at one session. In fact, the total solution was used 10 - 20 ml every session. Aerobic exercise such as walking or swimming was recommended for all subjects for 30 - 60 minutes, 3 - 4 times a week. Moderate exercise was discouraged, during treatment period.

This study was approved and waived the requirement for obtaining informed consent because of the retrospective nature by the Institutional Review Board of Pusan National University, Yangsan Hospital.

Data are expressed as mean ± SD, or median with interquartile range for continuous variables and frequency (%) for categorical variables. Tests for differences between the 2 groups (TG and CG) were performed using a chi-square test for categorical variables and a two-sample t-test for continuous variables at the baseline. Changes in VAS, ODI and BEPSI between at the start of the study and at 24 weeks were tested using a paired t-test. Pre-post gain score analysis between groups was performed using the Mann-Whitney U test. A P ≤ 0.05 (both tails) was considered significant using SPSS 11.0 for Windows (SPSS, Inc., Chicago, IL, USA).

RESULTS
All subjects had experienced CLBP for an average of >40 months. Among them, 49 (67.1%) had previously undergone other treatments including pharmacologic management, physical therapy, acupuncture, other injection (steroid nerve blocks, or dry needling of trigger point injections). There were no significant differences in age, sex ratio, duration of pain, comorbidities, previous treatments, VAS or ODI before initiation of prolotherapy between TG and CG (Table 1). In the TG, VAS decreased gradually and significantly (p < 0.001 by paired t-test) to 20.0% (median, 25 - 75%; 5.0, 3.0 - 6.0) of baseline (6.0, 4.0 - 8.0) at week 6, 42.2% (3.0, 2.0 - 5.0) at week 10, and 58.6% (2.5, 2.0 - 4.0) at week 24. In the CG, VAS remained unchanged throughout the 24 weeks (Fig. 1A). In the TG, ODI decreased gradually to 20.0% (median, 25% - 75%; 18.0, 8.0 - 34.0) of baseline (24.0, 16.0 - 30.0) at week 10 (p < 0.05 by paired t-test), then decreased sharply to 52.0% (12.0, 4.0 - 28.0) at week 24 (p < 0.001 by paired t-test). In the CG, ODI remained unchanged.
throughout the 24 weeks (Fig. 1B). The pre-post mean gain scores of VAS and ODI between the baseline and 24 weeks after treatment were significantly greater in TG than in CG (p < 0.001 by Mann-Whitney U test).

In the TG, BEPSI-K decreased gradually to 9.9% (mean ± SD; 1.8 ± 0.6) of baseline (2.0 ± 0.7) at week 6 (P = 0.004 by paired t-test), 15.5% (1.6 ± 0.5) at week 10 (P < 0.001 by paired t-test), and 24.7% (1.4 ± 0.4) at week 24 (p < 0.001 by paired t-test) (Fig. 1C). Our results also showed that VAS and BEPSI-K scores tended to decrease gradually over time, while ODI scores initially decreased gradually, then rapidly over time during 24 weeks in TG (p for linear trend < 0.001).

Twenty-nine patients (76.3%) in the TG and two (5.7%) in the CG achieved at least 50% reduction in VAS scores from baseline to 24 weeks, which indicated a
successful clinical outcome (Fig. 1D). All subjects did not complain significant adverse symptoms.

DISCUSSION
This study was designed to evaluate the effectiveness of prolotherapy on pain, disability, and stress in patients with CLBP according to patient’s adherence of prolotherapy. As results, prolotherapy may be an efficient and favorable option for treating CLBP patients with good adherence to therapy.

Although the precise mechanism of action for prolotherapy is not known, prolotherapy may act as central pain modulators and to stimulate release of tissue growth factors via local inflammation\(^5\). The potential risks of prolotherapy include infection, nerve damage, hematoma, pneumothorax, and injection into the subarachnoid space or arachnoiditis (inflammation of the membrane covering the spinal cord); There is possibility of complications due to the injection of anesthetic, drug reactions, or other factors, which may involve other parts of body, including the possibility of brain damage, death, heart attack and stroke.

In the present study, both VAS and ODI in the TG decreased by approximately half (58.6% and 52.0%, respectively) of baseline value, a statistically significant (p < 0.001 and p < 0.001, respectively). In contrast, there were no significant changes in VAS and ODI in the CG. This implies that at least 10 once-a-week sessions are required for prolotherapy to be clinically successful. Our results are consistent with those of previous studies\(^2-8\). The Cochrane review reported that prolotherapy may improve CLBP and disability when combined with spinal manipulation, exercise, and other co-interventions\(^9\). However, one study showed that three times once-weekly sclerosant injections alone were not an effective treatment in many patients with undifferentiated CLBP, because three times injection only may not be enough for its full effectiveness\(^9\).

This study has several limitations. First, this is not a randomized controlled study. Patients were assigned to either the TG or CG group after completion of treatment, which was confirmed by chart review, because this was a retrospective chart review. Second, bio-behavioral influences such as smoking, alcohol consumption, sleep deprivation, deficiency of hormonal or nutritional factors associated with musculoskeletal pain were not investigated. Third, as the data on VAS, ODI, and BEPSI-K were collected through a self-reporting questionnaire, outcomes could have been over-or underestimated.

CONCLUSION
Prolotherapy may be an efficient option for the treatment of CLBP in patients whose symptoms do not improve after the use of other treatment modalities, especially when they show good adherence to at least 10 treatment session of prolotherapy.

ACKNOWLEDGMENT
The first two authors equally contributed to this work as first authors. Special thanks to my colleagues Dr. Young Hye Cho and Dr. Young Jin Tak for the feedback and assistance when we needed it.

Disclosures: No grant or financial support was received.

Conflict of interest: The authors declare that there is no conflict of interests regarding publication of this article.

REFERENCES
Original Article

Correlations among Psychological Status, Family Functioning, and Coping Style in Chinese Patients with Recurrent Spontaneous Miscarriage

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Kuwait Medical Journal 2016; 48 (3): 219 - 226

ABSTRACT

Objectives: To explore the correlations among psychological status, family functioning, and coping style in patients with recurrent spontaneous miscarriage (RSM) and compare them with healthy women

Design: Prospective case-control study

Setting: Department of Gynecology, Guangzhou Women and Children’s Medical Center, Guangdong, China

Subjects: One hundred and six RSM patients were selected as the study group and 105 healthy women as the controls.

Intervention: All subjects were asked to complete three self-report instruments: the Symptom Check List (SCL-90), the Family Assessment Device (FAD), and the Medical Coping Mode Questionnaire (MCMQ).

Main outcome measure(s): The mean score of each instrument was calculated and data were analyzed by using t test, Chi-square test, and Pearson’s and Spearman’s correlation analysis.

Results: RSM patients had a higher score than the control group on the SCL-90 (P < 0.01) and reported higher levels of affective responsiveness, affective involvement, and behavior control. The remaining factor scores for family functioning were significantly lower than those in the control group (P < 0.01). RSM patients had significantly higher scores on acceptance-resignation compared with the controls (P < 0.01). Scores of RSM patients on the SCL-90 and FDA showed a significant negative correlation (P < 0.05); whereas no significant correlations were found between SCL-90 and coping styles (P > 0.05).

Conclusions: RSM patients had poorer psychological status but better family functioning than healthy women. Acceptance-resignation was the most frequently used coping style for RSM patients.

KEYWORDS: coping style, family functioning, pregnancy, recurrent spontaneous miscarriage

INTRODUCTION

Recurrent spontaneous miscarriage (RSM), defined as two or more consecutive spontaneous miscarriages, is a common disorder caused by complicated etiology in obstetrics and gynecology. In the west, RSM occurs in about 1 - 5% of active reproducing couples, which is similar to the rate reported in China, and the incidence rate increases in patients under the age of 18 or above 35 years. Considered as a severe trauma to couples or even to the whole family, RSM has received increasing attention in recent years. Various studies have focused on its etiology, pathogenesis, therapy, and management. Much of the research on the psychology of RSM patients has made great progress. Research shows that one’s physical and psychological status is related not only to social and psychological factors, but also to the family and social support, coping style, and other intermediary factors. A great number of studies have indicated that RSM can affect patients’ mental health, psychological adjustment, and daily life. Conversely, psychological and mental status in turn can have an effect on a successful pregnancy.

Studies have reported that anxiety and depression are the most frequent unpleasant emotions in people with recurrent spontaneous miscarriage.
patients’ response to RSM. In addition, a poor marital relationship and quality of life have also been reported to be associated with psychological symptoms for these patients. However, research that comprehensively evaluates the psychological status of RSM patients’ has been insufficient, especially with regard to comparing RSM patients with healthy women without miscarriage.

Family is the smallest unit of people’s lives, and family function affects people’s emotional experience and emotional support. Several studies have provided evidence that healthy family functioning is associated with patients’ having a positive emotional response and building confidence in overcoming disease. Additionally, positive coping can help in keeping a good state of mind, while negative coping has an adverse effect on the rehabilitation of patients. However, little is known about the family functioning and coping style of RSM patients, or about the relationship between them.

Therefore, the purpose of this study was to 1) assess psychological status, family functioning, and coping style in RSM patients; 2) examine the differences between RSM patients and healthy women; and 3) evaluate the correlations between socio-demographic characteristics, mental health, family functioning, and coping style in RSM patients.

SUBJECTS AND METHODS

Inclusion and exclusion criteria

Patients or healthy women were selected, if they met the following inclusion criteria: 1) the education level of all participants should be primary school level or above; 2) all participants had normal mind and clear consciousness with informed consent; and 3) patients had experienced two or more consecutive spontaneous miscarriages and gave no successful births, while healthy women had at least one child and had no history of miscarriage, fetal death, or stillbirth. In addition, patients who had been diagnosed with unexplained RSM were selected.

The exclusion criteria included 1) those who have serious illness with heart, brain, lung, or other organs; 2) who have a history of severe physical disease or they recently suffered serious mental frustration; and 3) patients with miscarriage due to genetic defect, hormone or endocrine abnormalities, uterine malformation, infection, or thrombophilia.

Sample recruitment

This study was carried out in the Gynecological Clinic of the Guangzhou Women and Children’s Medical Center in Guangzhou, China. Convenience sampling was employed to select the sample. In the regular follow-up of patients, a total of 106 patients who were diagnosed with unexplained RSM were recruited into the study group. The control group was composed of 105 women who were attending the outpatient clinic for a medical examination and met the criteria for inclusion in the study.

Data collection

In order to guarantee the quality and uniformity of the scale, all data were collected by two researchers from September 2013 to December 2013. The researchers used the unified guide language to correctly deliver the questionnaires to the patients before data collection. After fully understanding the meaning and requirements of all the questions, the participants completed the self-assessment and their answers were recorded independently without any interference or prompting. Of the 211 questionnaires collected, only one questionnaire was invalid because of incompleteness. The effective rate of the questionnaire was 99.5%.

Measures

The Symptom Check List-90 (SCL-90), Family Assessment Device (FAD), and Medical Coping Mode Questionnaire (MCMQ) were applied to record psychological status, family functioning, and coping style, respectively.

Symptom check list

The Symptom Check List-90 (SCL-90) was employed to evaluate the psychological status of all participants. The SCL-90 was translated into Chinese by Wang. The Chinese version has been evaluated and shown to be effective. At present, this instrument has been widely applied in clinical research to measure a series of psychological symptoms and problems in the area of mental health. The measure can assess whether a person has certain psychiatric symptoms and the severity of symptoms through inquiring about functioning in areas such as feelings, emotions, consciousness, thinking, behavior habits, interpersonal relationships, diet, and sleep.

This scale consists of 90 self-assessment items that comprise the following nine subscales: Somatization (SOM), Obsessive-Compulsive (OC), Interpersonal-Sensitivity (IS), Depression (DEP), Anxiety (ANX), Hostility (HOS), Phobic Anxiety (PHOB), Paranoid Ideation (PAR), and Psychoticism (PSY). Each item is responded to using the following 5 ratings according to the severity of the symptom: 1 = no; 2 = mild; 3 = moderate; 4 = heavy, and 5 = serious. The SCL-90 provides a total score and subscale scores based on summing of the item responses. Higher scores indicate a more severe negative psychological status. It has been reported that subscales of the SCL-90 have good
reliability and validity. The reliabilities (Cronbach’s alpha) of the subscales have ranged from 0.69 to 0.99\textsuperscript{[25-27]}. The Cronbach’s alphas in the present study were acceptable and ranged from 0.68 to 0.88.

**Family assessment device**

Family functioning was measured with the Chinese version of the Family Assessment Device (FAD)\textsuperscript{[28]} that was translated from the foreign version\textsuperscript{[29]}. The FAD can effectively identify existing problems in a family and distinguish between a healthy and unhealthy family. The FAD consists of 60 items and contains six dimensions and seven subscales: Problem Solving (PS), Communication (CM), Roles (RL), Affective Responsiveness (AR), Affective Involvement (AI), Behavior Control (BC), and General Functioning (GF). Each item is responded to using four options ranging from 1 - 4 that indicate different levels of agreement or disagreement. Item responses are summed and divided by the number of items for each subscale to provide subscale scores. Lower scores represent healthy family functioning such that the lower the score, the more healthy the family functioning.

The translated version of this questionnaire has excellent reliability and validity\textsuperscript{[28,30]}. In this study, the reliabilities of all subscales were considered sufficient (Cronbach’s alphas ranged from 0.71 to 0.81).

**Medical coping mode questionnaire**

The Medical Coping Mode Questionnaire (MCMQ) was used to assess illness-related coping styles and has three subscales: Confrontation, Avoidance, and Acceptance-Resignation. One item was added to the scale when the original version\textsuperscript{[31]} was translated into Chinese\textsuperscript{[32]}. The translated version of the MCMQ consists of 20 items. For each item, responses are provided ranging from 1 - 4: 1 = not at all, 2 = a few, 3 = quite a few, and 4 = a lot. Eight items are reverse-scored. Higher scores represent the more frequent the coping behaviors are adopted by the individual. The three subscales have demonstrated good reliability (Cronbach’s alphas were 0.63, 0.64, 0.60, respectively) according to the criteria reported by Shen and Jiang\textsuperscript{[32]}.

**Socio-demographic and medical data**

In order to describe the characteristics of all participants, a questionnaire was developed by the researchers and used to collect socio-demographic and disease-related data from patients’ medical records. Socio-demographic characteristics included age, household income, education level, marital relationship quality, family support, and satisfaction with their living conditions. Disease-related data consisted of frequency of pregnancy, frequency of spontaneous miscarriage, frequency of artificial miscarriage, and health status before the last miscarriage.

**Ethical approval**

This research was conducted by the Guangdong Province Population and Family Planning Commission and was approved by the Ethical Committee of the Guangzhou Women and Children’s Medical Center, China. All participants who volunteered in the research were provided a verbal and written explanation and signed an informed consent before participating in the investigation.

**Statistical analysis**

All statistical analyses were performed using SPSS 19.0 software (SPSS, Chicago, US). The level of significance was set at \( P < 0.05 \). The statistical procedures included 1) summarizing categorical variables by using frequencies and percentages, while summarizing measurement data using mean and standard deviation; 2) analyzing the difference between the two groups using Chi-square test (categorical variables) and two independent-samples t-tests (measurement data); and 3) testing the two groups of participants separately by analyzing the Pearson’s and Spearman’s correlations for mental health, family functioning, and coping style.

**RESULTS**

**Comparisons of socio-demographic and clinical data**

As shown in Table 1, the frequency of pregnancy in patients with RSM was about 3 pregnancies (mean = 2.89), with an average spontaneous miscarriage of 2.56. The results revealed a large number of patients (94.3%) were in a good marital relationship and most (95.4%) received strong support from their family. Most patients (76.4%) were satisfied with their living conditions. Before the last miscarriage, most of the patients’ (91.5%) physical and mental status were good. There were no significant differences between the two groups in age, household income, education level, marital relationship quality, family support, and attitude toward living status (\( P > 0.05 \)).

**Comparisons of mental health, family functioning, and coping style**

The differences between RSM patients and healthy women with regard to psychological status, family functioning, and coping style are shown in Table 2.

Psychological status: For patients, the mean scores of the SCL-90 factors were all above 2.0 and the total score was above 160, which are considered threshold scores\textsuperscript{[33]}. Both factor scores and total score were higher than those in healthy women. The two independent-samples t-test showed that the difference in the two groups was highly significant (\( P < 0.01 \)).
Family functioning: The findings demonstrated that the mean factor scores on the FAD in RSM patients were lower than those in the control group, but all of them fluctuated between 2 and 3. Significant differences were found between the two groups in “problem solving” and “general functioning” ($P < 0.01$), and “communication” and “roles” ($P < 0.05$).

Coping style: As shown in Table 2, compared with healthy women RSM patients had a lower score for confrontation but higher scores for avoidance and acceptance-resignation. T-tests indicated that of the three coping styles, the average score for patients for the acceptance-resignation coping style was significantly higher than that of healthy women ($P < 0.01$), whereas there were no significant differences found for confrontation and avoidance.

Correlations of socio-demographic variables, psychological status, family functioning, and coping style in patients

The factor scores and total score on the SCL-90 had significant negative correlations with family functioning, but no significant correlation was found with the three coping styles. However, statistical analysis confirmed a significant positive correlation between the avoidance coping style and the family functioning subscales in addition to problem solving ($P$< 0.05).
Table 4. Correlations among Psychological Status, Family Functioning, and Coping Style... September 2016

<table>
<thead>
<tr>
<th>Variables</th>
<th>Psychological status</th>
<th>Family functioning</th>
<th>Coping style</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>p-value</td>
<td>r</td>
</tr>
<tr>
<td>Age</td>
<td>0.1</td>
<td>0.328</td>
<td>0.22</td>
</tr>
<tr>
<td>Household income</td>
<td>-0.08</td>
<td>0.407</td>
<td>-0.06</td>
</tr>
<tr>
<td>Education level</td>
<td>0.19</td>
<td>0.056</td>
<td>0.24</td>
</tr>
<tr>
<td>Frequency of pregnancy</td>
<td>0.26</td>
<td>0.007**</td>
<td>-0.37</td>
</tr>
<tr>
<td>Frequency of spontaneous miscarriage</td>
<td>0.23</td>
<td>0.018*</td>
<td>-0.23</td>
</tr>
<tr>
<td>Frequency of artificial miscarriage</td>
<td>0.14</td>
<td>0.141</td>
<td>-0.34</td>
</tr>
<tr>
<td>Marital relationship</td>
<td>0.22</td>
<td>0.026*</td>
<td>-0.17</td>
</tr>
<tr>
<td>Family support</td>
<td>0.07</td>
<td>0.477</td>
<td>-0.03</td>
</tr>
<tr>
<td>Living status</td>
<td>0.19</td>
<td>0.049*</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Regression coefficients where **p < 0.05; *p < 0.01.

< 0.05). In addition, the confrontation and acceptance-resignation coping styles had highly significant positive correlations with all subscales of the FAD (P < 0.01). Results are shown in Table 3.

Furthermore, frequency of pregnancy, frequency of spontaneous miscarriage, marital relationship, and living status were the four socio-demographic variables that had a significant positive correlation with mental health. In addition, age and education level were found to have a significant positive correlation with the FAD. On the contrary, frequency of pregnancy, frequency of spontaneous miscarriage, and frequency of artificial miscarriage had a significant negative correlation with the FAD. There were no significant correlations between the socio-demographic variables and coping style. Results are shown in Table 4.

DISCUSSION

Psychological status

This study showed that RSM patients had higher scores on the SCL-90 compared with healthy women, which was not surprising. This finding suggests that RSM patients were experiencing poorer mental health, which is consistent with other studies [10,34]. The findings also indicated that all the average scores of patients were above 2 and below 3, a level...
requiring further evaluation \[33\]. Such a score means psychological symptoms were slight in these patients. This result is similar to the study by Mevorach-Zussman et al. \[34\], although slightly different from that of Francisco Mde et al\[35\]. There are probably two reasons for this difference. One possibility is the difference in the samples and data collection method, the other is the regional difference in patient’s psychological state. Regional differences include such factors as the local economy, healthcare, culture, environment, etc. In addition, the findings indicated that frequency of pregnancy, frequency of spontaneous miscarriage, marital relationship, and living status were four variables affecting the psychological status of patients. Therefore, the combination of these four factors in predicting patients’ mental status is particularly important. In this study, given that the marital relationship and living status were good, it does not matter that patients had mild psychological symptoms.

**Family functioning**

Even if research has revealed that a person living within a poorly functioning family may bear a heavier burden\[36\], little attention has been paid to caregivers and patients with RSM. Only a few studies focused on their marital relationship and social support \[13,37\]. One of the focus areas of this study was family functioning. In this study, though their scores on affective responsiveness, affective involvement, and behavior control were not significantly lower than those of healthy women, RSM patients’ overall scores on the FAD were in the range of 2 - 3. Even the highest score (score of affective involvement) was less than three, which is considered healthy functioning. This finding indicates that family functioning of RSM patients was far from dysfunctional. However, results showed the older the person’s age and higher the education level, the worse the family functioning. A reasonable explanation may be that the older the patients are or the higher their education level, the greater the expectation on reproduction they hold, which results in focusing too much on themselves and giving less care to their family. By contrast, frequency of pregnancy and miscarriage were negatively associated with the FAD. It may be that repeated pregnancy loss makes patients become aware of the importance of family. They may more easily ask their families for help and get through the difficulties together. Therefore, adequate care and support were particularly important factors in family functioning of patients.

**Coping style**

A previous study showed that ineffective coping strategies were increased in patients with recurrent spontaneous miscarriage \[38\]. In this study, the acceptance-resignation mean score for RSM patients was significantly higher than that of healthy women, which demonstrated that these patients were more inclined to take passive measures to solve problems. This finding is consistent with other studies\[38\]. However, worrying may cause patients’ mental status or illness to become worse to the extent that a vicious circle occurs. Research also indicated there were significant correlations between the coping style of acceptance-resignation and subscale scores on the FAD, which suggests that coping strategies might be determined by family functioning. Unhealthy family functioning may lead to a negative or pessimistic mentality, affecting their approach to problems or difficulties. For these patients, the effective use of family functioning is particularly important. Family functioning concerns patients’ problem-solving strategies as well as their family relationships and the prognosis of the disease. Therefore, we should emphasize family and social support to improve the psychological state of patients. We should help patients and their families so that their family functioning works well. Patients should be given some suggestions on how to actively handle problems, such as asking doctors for medical help or strengthening communication with the family.

**Limitations**

First, the results may be limited because of the small sample size and using only one hospital in Guangzhou, China. Future studies should have a larger sample size and recruit patients from different hospitals. Second, when evaluating family functioning, we used only the patient’s perspective and did not assess those of the caregivers. Considering the family as a whole system, caregivers should also be studied in the future. Third, the factors affecting patients’ psychological state are complicated. Only a few areas were addressed in this study. In future studies, other factors and the quantitative relationships between factors need to be analyzed, and researchers could establish a model to predict patients’ psychological state.

**CONCLUSIONS**

Psychological status was poorer but family functioning was healthier in patients with recurrent spontaneous miscarriage when compared with healthy women. Patients were more inclined to adopt a negative coping style to deal with problems. Therefore, psychological status and coping skills need to be improved for RSM patients. Miscarriage, marital relationship, and living condition were related to mental health, and family functioning was related to coping style. As such, further effective and sustained
interventions, such as keeping sound relationship with families and maintaining good family functioning, may be essential to promote psychological status and positive coping.

ACKNOWLEDGMENTS

We express our sincere appreciation to all researchers and participants. This research was supported by the Population and Family Planning Commission of Guangdong, China (2013) and the Ethical Committee of the Guangzhou Women and Children’s Medical Center (2013).

Conflict of interest: All of the authors declare that they have no conflicts of interest regarding this paper.

Authorship: Authors 1 and 2 have equally contributed to this manuscript.

REFERENCES

Comparison of Estimated Glomerular Filtration Rate Using CKD-EPI and MDRD Equations in Screening Prevalence of CKD in Healthy Saudi Population

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ABSTRACT

Objectives: Chronic Kidney Disease Epidemiology Collaboration (CKD–EPI) is an emerging and more accurate Glomerular filtration rate (GFR) predictive equation. However, there is no study regarding the performance and validity of CKD-EPI equation in Saudi population. Our aim is to determine the performance of CKD-EPI equation in normal Saudi population in diverse demographic and compare with Modification of Diet in Renal Disease (MDRD) equation.

Design: Cross-sectional study

Setting: Blood bank, administrative office, and night literacy school in King Saud University, Riyadh, Saudi Arabia.

Subjects: Five hundred and sixteen Saudi healthy participants

Intervention(s): Not Applicable.

Main outcome measure(s): Patients with mean age of 34.49 ± 13.3 years, with 255 (49.2%) male, BMI of 27.4 ± 5.4 kg/m², and serum creatinine of 79 ± 32 μmol/l. Overall, estimated glomerular filtration rate (eGFR) MDRD was 97.5 ± 32 ml/min/1.73m² and the eGFR CKD-EPI was 102.3 ± 25.5ml/min/1.73m². In males, the eGFR MDRD was 97.5 ± 24.4 ml/min/1.73m² and eGFR CKD-EPI was 102.9 ± 20 ml/min/1.73m², whereas in females, eGFR MDRD was 97.5 ± 38 ml/min/1.73m² and eGFR CKD-EPI was 101.7 ± 30 ml/min/1.73m². In all subsets, eGFR CKD-EPI was more than the eGFR MDRD. This absolute difference between the two formulas can reach from 4 - 42.1 ml/min/1.73m². Prevalence of GFR 60-89 ml/min/1.73m² by means of CKD-EPI was 19.9% comparing to MDRD which resulted to 33%. Prevalence of GFR <60 ml/min/1.73m² using CKD-EPI and MDRD was 7.1% and 9.4%, correspondingly.

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INTRODUCTION

Chronic kidney disease (CKD) is a major health problem worldwide that resulted to end stage renal disease (ESRD) and is associated with increased risk of morbidity mortality and reduced quality of life. Furthermore, it is an established risk factor for cardiovascular disease[1-2]. Glomerular filtration rate (GFR) is a surrogate for kidney function and decrease in GFR suggest advancement in CKD and progression to renal failure[3-4]. Therefore, a critical monitoring in high risk patients is essential. Predictive equations provide a rapid and convenient method of assessing GFR, but so far none is ideal and updated equations are tried and validated. Serum creatinine is affected by muscle mass, age, liver disease and inflammation[5-7]. Inulin and radioactive isotopes are expensive and time-consuming requiring hospitalization and cannot be used for frequent assessments. Modification of Diet in Renal Disease (MDRD) is the most frequently used formula, but have inaccuracy at GFR more than 60 ml/min/1.73m²[8-10]. Recently, Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) published an equation for estimation of GFR using age, gender, race and serum creatinine which is considered as more precise[9-15]. However, performances of the CKD-EPI equation in Saudi population in different subset

KEYWORDS: chronic kidney disease, creatinine; King Saud University; predictive equation

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of demographic and clinical characteristics was not conducted such as gender, body mass index (BMI), obesity and categories of GFR. Furthermore, there are recommendations to test the versatility of the equation in diverse ethnic and social groups[13-14]. Present study was therefore, under taken.

SUBJECTS AND METHODS
This is a cross-sectional study comprising of 516 healthy adult volunteers conducted in blood bank, government administrative offices, security guard compounds and night literacy school in Riyadh, Saudi Arabia. Inclusion criteria were Saudi healthy adults with age ≥18 years, both genders, with no renal or cardiovascular disease and not on any medication. Exclusion criteria were history of chronic renal failure or family history of renal disease, edema, heart failure, pregnancy or infection. Patients were consented and demographic data was collected comprising of age, gender, weight, height, blood pressure and comorbidities. In all subjects, blood samples were tested for the estimation of serum creatinine using Jaffe’s method and fasting blood sugar, triglycerides, lipids, cholesterol and liver function was tested in an auto analyzer in the central laboratory of King Saud University, Riyadh, Saudi Arabia which was standardized to isotope dilution mass spectrometry.

eGFR was calculated through www.kidney.org/professionals/KDOQI/gfr_calculator using MDRD and CKD-EPI predictive equations[16-18]. Calculation of eGFR by MDRD and CKD-EPI was compared base on the subsets of demographic. In addition, absolute difference in GFR (CKD – EPI – MDRD) was calculated in all subjects and in all sub-settings. Ethical approval was obtained from the Institutional Research Board of the College of Medicine, King Saud University, Riyadh, Saudi Arabia.

Statistical Analysis
Qualitative variables like age, height, weight, BMI, serum creatinine and GFR are expressed as mean and standard deviation. Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) version 19 software (SPSS Inc., Chicago, IL, USA). We used Shapiro-Wilk test of normality to check if the data of two formulas (eGFR MDRD & eGFR CKD-EPI) follow normal distribution. As we found that the data did not follow the normal distribution, we used Wilcoxon signied rank test to compare the two formulas (eGFR MDRD & eGFR CKD-EPI). We calculated the measurement of Kappa agreement to determine its range and found that there was moderate agreement between the two formulas since Kappa has a value 0.555 and p-value of <0.0001. Also, we calculated Pearson correlation coefficient between the two formulas and found that there was strong positive correlation between them since r = 0.909 and p <0.001, where r is Pearson correlation coefficient. Statistical significance will be achieved, if P-value is less than 0.05.

RESULTS
The demographic and clinical characteristics of the participants were tabulated (Table 1). Total participants were 516 consisting of 253 (49%) males, mean GFR MDRD of 97.5 ± 32 ml/min/1.73m² and mean GFR-EPI of 102.3 ± 25.5 ml/min/1.73m².

| Table 1: Demographic characteristics of Saudi adults subjected to eGFR |
|---------------------|-----------------|-----------------|
| Variables          | Number of        | Mean ± SD       |
| All Age            | 516             | 34.49 ± 13.31 years |
| < 30 years         | 253             | 23.11 ± 3.69 years |
| 30 – 49 years      | 192             | 41.09 ± 6.4 years |
| > 50 – 59 years    | 58              | 55.12 ± 2.7 years |
| > 60 years         | 13              | 66.5 ± 5.01 years |
| Male               | 253             | 49%             |
| Height (cm)        | 516             | 166.08 ± 8.5    |
| Weight (kg)        | 516             | 75.8 ± 18.2     |
| BMI (kg/m²)        | 516             | 27.3 ± 5.4      |
| Creatinine (μmol/L)| 516             | 79.04 ± 31.82   |
| GFR CKD – EPI (ml/min/1.73 m²)| 516 | 102.3 ± 25.5  |
| GFR – MDRD (ml/min/1.73 m²)| 516 | 97.5 ± 32    |

The comparison of eGFR using CKD-EPI and MDRD in various subsets of age, gender, BMI and GFR categories are shown in Table 2. In all patients, eGFR in CKD-EPI was found to be significantly higher than MDRD in all groups and subgroups such as age, gender, and BMI, but resulted to be insignificant in age >60 years.

The absolute difference in the GFR measured between CKD-EPI and MDRD in subsets of age, BMI, gender, and GFR categories are detailed in Table 3, which shows decrease of difference in patients with age increase.

The percentage of participants with absolute difference between the two equations is shown in Table 4. It was found that 86.7% of the participants had an absolute difference of <5 ml/min/1.73m². Similarly, 4.6% of the participants had an absolute difference of >20 ml/min/1.73m².

The total number of patients was classified using MDRD and CKD-EPI to determine the stage of CKD which is shown in Table 5. Using the MDRD equation, 220 (43%) subjects had CKD with GFR <90 ml/min/1.73m² and 48 (9.3%) patients have GFR <60 ml/min/1.73m². However, by the use of CKD-EPI equation, 139 (27%) of the participants had GFR <90 ml/min/1.73m² and 37(7.1%) patients had GFR <60 ml/min/1.73m².
Table 2: Comparison of eGFR by CKD-EPI and MDRD in adult Saudi under different subset of conditions

<table>
<thead>
<tr>
<th>Variables</th>
<th>eGFR CKD-EPI ml/min/1.73 m² Mean±SD (Range)</th>
<th>eGFR MDRD ml/min/1.73 m² Mean±SD (Range)</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>102.3 ± 25.5 (14 - 164)</td>
<td>97.5 ± 32 (13 - 302)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Male</td>
<td>102.98 ± 20 (17 - 145)</td>
<td>97.5 ± 24.4 (16 - 226)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Female</td>
<td>101.6 ± 29.9 (14 - 164)</td>
<td>97.5 ± 38.26 (13 - 302)</td>
<td>0.0001</td>
</tr>
<tr>
<td><strong>BMI (kg/m²): &lt;25 (n = 176)</strong></td>
<td>107.7 ± 27.1 (17 - 164)</td>
<td>104.3 ± 38.6 (13 - 226)</td>
<td>0.0001</td>
</tr>
<tr>
<td><strong>BMI (kg/m²): 25 - 30 (n = 193)</strong></td>
<td>99.19 ± 24.2 (36 - 146)</td>
<td>93.9 ± 28.1 (35 - 149)</td>
<td>0.0001</td>
</tr>
<tr>
<td><strong>BMI (kg/m²): &gt;30 (n = 132)</strong></td>
<td>100.4 ± 23.4 (27 - 138)</td>
<td>94.3 ± 25.4 (25 - 148)</td>
<td>0.0001</td>
</tr>
<tr>
<td>AGE: ALL</td>
<td>102.3 ± 25.5 (14 - 164)</td>
<td>97.5 ± 32.1 (13 - 302)</td>
<td>0.0001</td>
</tr>
<tr>
<td>AGE: &lt;30yrs</td>
<td>111.63 ± 23.2 (17 - 164)</td>
<td>106.25 ± 33.3 (15 - 302)</td>
<td>0.0001</td>
</tr>
<tr>
<td>AGE: 30 - 49 yrs</td>
<td>95.59 ± 24.91 (14 - 142)</td>
<td>89.96 ± 28.04 (13 - 180)</td>
<td>0.0001</td>
</tr>
<tr>
<td>AGE: 50 - 60 yrs</td>
<td>87.8 ± 23.1 (17 - 139)</td>
<td>87.2 ± 31.6 (16 - 226)</td>
<td>0.001</td>
</tr>
<tr>
<td>Age &gt;60 yrs</td>
<td>86.15 ± 18.4 (31 - 104)</td>
<td>86.5 ± 22.02 (30 - 123)</td>
<td>0.813</td>
</tr>
<tr>
<td>eGFR: &lt;30 ml/min/1.73 m²</td>
<td>19.8 ± 5.4 (14 - 27)</td>
<td>18.4 ± 5.2 (13 - 25)</td>
<td>0.038</td>
</tr>
<tr>
<td>eGFR: 30 - 59 ml/min/1.73 m²</td>
<td>45.8 ± 8.7 (31 - 59)</td>
<td>42.4 ± 7.5 (29 - 55)</td>
<td>0.0001</td>
</tr>
<tr>
<td>eGFR: 60 - 89 ml/min/1.73 m²</td>
<td>80.09 ± 7.9 (60.3 - 90)</td>
<td>71.7 ± 7.8 (53 - 95)</td>
<td>0.0001</td>
</tr>
<tr>
<td>eGFR: &gt;90 (373)ml/min/1.73 m²</td>
<td>114.3 ± 15.01 (91 - 164)</td>
<td>110.4 ± 26.4 (78 - 302)</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

*By Wilcoxon Signed rank test. To compare between two formulas for different categories.
** Some data are missing.

DISCUSSION

GFR is a surrogate of kidney function and its estimation is essential for CKD staging and drug dosing which are solely eliminated by kidney. Estimates of GFR using MDRD estimation equations use the levels of endogenous renal markers and demographic variables of age, sex and race. Many studies were conducted to compare both formulas in different age, race, clinical condition and risk factor of cardiovascular disease.

The Modification of Diet in Renal Disease (MDRD) – Study equation has been practiced worldwide for estimating GFR from serum creatinine. Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) group developed a new equation that claims to be more accurate and could replace MDRD. Many studies were conducted to compare both formulas in different age, race, clinical condition and risk factor of cardiovascular disease.

Our results agree with the findings of some other studies such as Lopez-Share et al[19] which included 858 participants and with Carter JL et al[20] - comprising of 174,448 adult participants, where the difference in eGFR between both formulas is higher in CKD-EPI equation, which is significant in male gender and younger population[19,20].

In our study, the prevalence of decreased eGFR with the value of 60 - 89 ml/min/1.73m² was reduced from 33% to 19.7% using CKD-EPI equation, and CKD Stage 3 - 4 was reduced from 9.4% to 7.1 % using MDRD equation, which is similar to the study of Matsushita K et al[8], where the eGFR was reduced from 8.7 - 6.3% using CKD-EPI equation. Likewise, the study of Giavarina D. et al[21] showed that the prevalence of decreased GFR with the value of 60 - 89 ml/min/1.73m² was lower in CKD-EPI equation (33.8% Vs. 49.1% in MDRD) and the estimated prevalence of CKD (eGFR <60 ml/min/1.73 m²) was 5.9% in CKD-EPI and 7.5% in MDRD.
When comparing to another SEEK study conducted in Saudi Arabia involving 491 participants, their findings showed lower prevalence of CKD, which resulted to 5.7% and 5.3% using the MDRD-3 and CKD-EPI, respectively[23]. They only included CKD Stages 1, 2 and 3 and did not report Stage 4 in their population where the prevalence of GFR 60 - 89 ml/min/1.73m² is 1.6% and 1%. Also, GFR <60 ml/min/1.73m² was 0.6 % and 0.2% by means of MDRD-3 and CKD-EPI, respectively.

The difference of the prevalence of CKD in our study from other SEEK study is that it contributed to sample collection site, since they collected the blood samples in a luxury commercial center, whereas we collected our blood samples in a blood bank, government administration office, security guard compounds and night literacy school, since we targeted the low and medium income population.

The strong points of our study is that we compared the formula in healthy Saudi Adult population and estimated the prevalence of mild decreased eGFR (60 - 89 ml/min/1.73m²) which support screening for chronic kidney disease for healthy Saudi individuals, especially the older population, to increase CKD awareness.

The limitations of our study are the performance of CKD-EPI equation that should also be tested in patients with different CKD stages, comorbidity condition like in cirrhosis patients, patients with diabetes, smokers, and in patients with renal transplant or coronary heart disease. Also, the restriction of our study and other studies is that it is a cross-sectional study which lacks gold standard, and further studies are needed to conduct covering these parameters. Finally, we use Jaffe’s method to measure serum creatinine using alkaline picurate which is commonly used in most hospitals and using more accurate test like Isotope Dilution Mass Spectrometry (IDMS), which is highly recommended.

CONCLUSION

Comparing eGFR using CKD-EPI and MDRD in healthy Saudi population, it shows that eGFR is higher in CKD-EPI than in MDRD in all categories with a difference of 4 - 42 ml/min/1.73m². CKD-EPI equation can be used in normal Saudi adults in a wide range of sub-settings.

ACKNOWLEDGMENT

This is to acknowledge Mr Amir Marzouk (Statistician, College of Medicine Research Center, College of Medicine, King Saud University) for his effort and hard work in proffering statistical analysis of our study. Also we are grateful to Dr Durdana Hammad for reviewing the article and providing

REFERENCES

11. White SL, Polkinghorne KR, Atkins RC, Chadban SJ. Comparison of the prevalence and mortality risk of CKD in Australia using the CKD Epidemiology Collaboration (CKD-EPI) and Modification of Diet in Renal Disease (MDRD) Study GFR estimating


Original Article

Incidence, Indications, and Risk Factors of Postpartum Hysterectomy

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Kuwait Medical Journal 2016; 48 (3): 232 - 236

ABSTRACT

Objective: To report the incidence rate of postpartum hysterectomy (PH) within six weeks postpartum and its indications, complications, and risk factors in Rasht, North of Iran
Design: Case-control study using patients’ documents of the period 2002 - 2013
Setting: Al-Zahra maternity hospital - the only tertiary maternity hospital in Rasht, North of Iran
Subjects: Seventy-eight patients consisting of 26 PH cases and 52 subjects of control group were studied.
Main outcome measure(s): Risk factors of PH
Results: The incidence rate of PH was 0.05%. The most common indication for PH was placenta previa (12/26, 46.2%). Cesarean delivery was significantly higher in case group (N = 22, 84.6%) than in control group (N = 30, 57.7%) (P = 0.022). Delivery method for 9 (75%) cases with placenta previa was cesarean section. Mean age (P = 0.003), gravidity (P = 0.001), parity (P = 0.0001), and number of previous cesarean deliveries (P = 0.0001) were significantly higher in case group. In logistic regression analysis, only number of previous cesarean section significantly increased the incidence of PH (OR: 5.408, 95% CI: 1.989 to 14.702). Transfusion was significantly higher in case group (P = 0.001). One woman with hysterectomy (3.8%) was admitted to the intensive care unit. Mortality was occurred in one (3.8%) patient in PH group.
Conclusion: Placenta previa is the major indication for PH and should be considered by delivery assistants and clinicians. In cases with history of previous cesarean section, the risk of PH should be considered. Policy makers should attempt to design effective programs for reducing cesarean section rates.

KEYWORDS: Postpartum hysterectomy, Placenta previa, Delayed postpartum hemorrhage, Cesarean section

INTRODUCTION

Postpartum hysterectomy (PH) refers to all hysterectomies performed subsequent to vaginal or Cesarean section deliveries up to six weeks after delivery[1]. In most of the patients, PH is a lifesaving operation when there is obstetric hemorrhage[2]. Most emergency PH are carried out following delivery to stop the early postpartum hemorrhage occurring within 24 hours after delivery[3]. The most common cause of early postpartum hemorrhage is uncontrollable atonic uterine bleeding, other causes including lower segment uterine bleeding that are caused by uterine incision or abnormal implantation of the placenta (placenta previa), or abnormal placental adhesion (accreta, increta, percreta), ruptured uterine vessels, and uterine rupture. Placenta previa (often in repeated cesareans) and atonic uterine is the most common indications of hysterectomy during delivery or after that[1-3]. Other common indication of PH is delayed postpartum hemorrhages which occur 24 hours after delivery up to 12 weeks after[4]. Delayed postpartum hemorrhages are often due to abnormal involution of the uterus after delivery[5]. Elective hysterectomies’ indications during childbirth include large or symptomatic myomas, severe hyperplasia, or carcinoma in situ of the cervix[1]. Postpartum hysterectomy occurs more frequently in women with high parity, uterine rupture, history of multiple cesearan sections, abnormal placental implantation, infection after delivery, and delayed postpartum

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hemorrhage. With regard to PH indications, not applying hysterectomy can lead to increase maternal morbidity and mortality rates. On the other hand, PH can increase mother’s morbidity (transfusion, fever, and urinary system damage) and mortalities. Various studies throughout the world reported different PH incidence rate between 0.02% and 2.3% of all deliveries. It is believed, with increasing of cesarean sections rate in recent years and its relationship to abnormal placental implantation, the incidence of peripartum hysterectomy and PH would be increased. In the two previous studies carried out in Iran, incidence rates of PH were reported 0.05% and 0.14%. But both of the previous studies had cross-sectional manner and the hysterectomy and healthy groups were not compared. Knowing the incidence rate, indications, complications, and risk factors of PH can be helpful to design programs for reducing this problem an its complications. Unfortunately, there is no sufficient information about PH in Iran. This study aimed to determine the incidence of PH, and its indications, complications, and risk factors in Al-Zahra maternity hospital, Rasht, Iran.

**SUBJECTS AND METHODS**

**Setting and study design**

After getting ethical approval from ethic committee of Guilan University of Medical Sciences a retrospective case control study was conducted on all deliveries performed between March 2002 and February 2013 at Al-Zahra maternity hospital. This hospital is the only tertiary maternity hospital in Rasht, North of Iran.

In this study, the cases were all women who underwent PH at Al-Zahra maternity hospital subsequent to vaginal or Cesarean section deliveries up to six weeks after delivery. For each case, two control subjects were included. Control subjects were women who underwent delivery at Al-Zahra maternity hospital. Selection of control group was done using patients’ document number. When we find a woman with PH, her document number was recorded and two nearest document numbers before and after that belonged to women underwent delivery were included as control subjects. By this selection method, we matched cases and controls by year and month of delivery.

**Data collection**

We used the data recorded in patients’ document. Data including women age, gravidity, parity, gestational age, previous cesarean section, delivery method, PH complications including transfusion, fever, infection, mortality, admission to the intensive care unit (ICU) of cases and controls were collected. Also, PH indications in case group were recorded.

**Statistical analysis**

Data were analyzed using SPSS version 21 software (SPSS, SPSS Inc., Chicago, IL, USA). The incidence rate of PH was calculated. Independent t test was performed to compare means between the two groups after checking normality using Kolmogorov–Smirnov test. To investigate the effect of studied variables on incidence of PH, we used logistic regression. Frequencies of PH indications, complications, and type of delivery between the two groups were compared using Fisher exact test. A p value less than 0.05 was considered statistically significant.

**RESULTS**

Over an eleven-year-period, 49,731 deliveries were performed in Al-Zahra Hospital out of which 19,184 cases (38.6%) were vaginal deliveries and 30,547 cases (61.4%) underwent cesarean section. All hysterectomies performed during our study period were 2079 (4.16%), out of which 26 hysterectomies were within six weeks after delivery. Accordingly, 78 patients consisting of 26 PH cases and 52 subjects as control group were studied. Incidence rate of PH during the eleven-year-period in Al-Zahra hospital was 0.05% or 0.5 per 1000 delivery. Of the 26 cases, four cases (15.4%) had vaginal delivery and 22 cases (84.6%) had cesarean section. The incidence rate of PH in women who underwent cesarean section (0.07%) was significantly higher than women who underwent vaginal deliveries (0.02%) (P = 0.006). The most common indication for PH was placenta previa which was indication for 12 patients (46.2%). Among patients with placenta previa, abnormal adhesion of placenta was seen in six (23.1%) cases. Other indications were, delayed postpartum hemorrhage in seven patients (26.9%), uterine rupture in three patients (11.5%), uterine atony in three patients (11.5%), and retroperitoneal hemorrhage due to arterial aneurysm of the left renal artery in one patient (3.8%). In control group, none of the aforementioned indications happened.

Frequency of cesarean section in case group (84.6%) was significantly higher than control group (57.7%) (P = 0.022) in recent birth. Delivery method for nine cases (75%) with placenta previa was cesarean section. The mean age in case group was significantly higher than the control group (P = 0.003). Mean of gravidity (P = 0.001), parity (P = 0.0001), number of previous cesarean section (P = 0.0001), and history of previous cesarean section (P = 0.001) were significantly higher in cases group than the control group. However, mean gestational age difference between the two groups was not statistically significant (P = 0.133) (Table 1).

In logistic regression analysis, variables which had significant effect in univariate analysis were included. Only previous cesarean section significantly
increased the risk of incidence of PH (P = 0.0001). The risk increased as the number of previous cesarean section increased - with each increase in the number of previous cesarean section, odds of the PH incidence would be increased approximately five times (OR = 5.408, 95% CI: 1.989-14.702). The effect of other studied variables on increasing or decreasing of the risk of PH was not significant (Table 2).

In case group, 22 women (84.6%) and in control group, two women (4.1%) required transfusion and this difference between the two groups was statistically significant (P = 0.0001). Both patients who required transfusion in the control group experienced severe anemia related to Beta minor thalassemia. One woman in PH group (3.8%) and none of the women in control group were admitted to the ICU, but this difference was not significant (P = 0.333). Mortality was occurred in one (3.8%) in PH group due to retroperitoneal bleeding caused by a ruptured aneurysm of the left renal artery. Other complications of hysterectomy were not observed.

DISCUSSION

Based on our findings, the incidence rate of PH in Rasht, Iran during the 11 years from March 2002 to February 2013 was 0.05% or 0.5 per 1000 delivery. The incidence rate of PH in cesarean delivery (0.07%) was significantly higher than vaginal deliveries (0.02%). In consistent with our finding, In Bodelon et al [4] study in Washington State the incidence rate of PH within 30 days after delivery was about 0.05%. But in a study by Sparic et al [13] in Belgrade, PH incidence rate within six weeks after delivery was 0.2%.

Most of previous studies reported emergency hysterectomy within 24 hours postpartum. Previous studies in Iran reported peripartum hysterectomy incidence. Yazdani et al [11] conducted a descriptive study on deliveries performed from 2002 to 2011 in Iran. They reported incidence rate of emergency peripartum hysterectomy as 0.05%, the incidence rate in cesarean section delivery was 0.07% and in vaginal delivery was 0.02%. But in a cross-sectional study by Gurtani et al [12] which was conducted in Isfahan, Iran between 2004 and 2009, the incidence rate of emergency peripartum hysterectomy was reported as 0.14%. Other studies from different part of the world reported various PH incidences rate. Tadesse et al [14] reported incidence rate of peripartum hysterectomy within 72 h after delivery as 0.02%. Other studies indicated incidence rate of peripartum hysterectomy between 0.02% and 0.41%[9, 15-21].

Based on our study findings, the most common indication for PH was placenta previa (46.2%). Other indications were delayed postpartum hemorrhage (26.9%), uterine rupture (11.5%), uterine atony (11.5%), and retroperitoneal hemorrhage due to arterial aneurysm of the left renal artery (3.8%).

Placenta previa, abruptio placenta, retained placenta (including placenta accreta, percreta and increta) significantly increase the incidence of PH. Delayed postpartum hemorrhage is mostly due to the abnormal involution of the uterus[9]. Bodelon et al [4] in a study reported that the factors associated with postpartum hemorrhage were significantly associated with the incidence of postpartum hysterectomy. In Ossola et al [22] study, Bodelon et al [4] study, Indulekha et al [16] study, and Chen et al [18] study, placenta previa was the main indication for PH. In Soheila et al [23] indications for PH were placenta accreta (48.5%), percreta (24.2%),

<table>
<thead>
<tr>
<th>Variables</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.040</td>
<td>0.936 – 1.155</td>
</tr>
<tr>
<td>Gravidity</td>
<td>1.231</td>
<td>0.460 – 3.290</td>
</tr>
<tr>
<td>Parity</td>
<td>0.599</td>
<td>0.163 – 2.204</td>
</tr>
<tr>
<td>Number of previous cesarean section</td>
<td>5.408</td>
<td>1.989 – 14.702</td>
</tr>
<tr>
<td>Delivery methods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaginal</td>
<td>1.195</td>
<td>0.223 – 6.412</td>
</tr>
<tr>
<td>Cesarean</td>
<td>22 (84.6)</td>
<td>30 (57.7)</td>
</tr>
</tbody>
</table>

*p-value*
increta (12.1%), and uterine atony (9.1%). But in Yazdani et al. study, the most common indications of hysterectomy were uterine atony (36.4%), and abnormal uterine adherence (27.3%). In Gurtani et al. study, the main cause of hysterectomy was placenta accreta (68.3%). In Bai et al. study most common indication for peripartum hysterectomy was uterine atony (41.58%), followed by placenta previa accreta (23.76%), placenta accreta (16.83%), and placenta previa (11.88%). Besides, in Tadsse et al. study, abnormal placenta 79%, uterine atony 16%, and trauma urethra 5% identified as indications of hysterectomy. According to Roethlisberger et al. study, abnormal placental adhesion and uterine atony were the major indications for PH. In Nisar et al. and Omole et al. studies, uterine rupture was the main indication of emergency postpartum hysterectomy. In both of these studies, parity in subjects was higher than in our cases. Also in Omole et al. study, the age of women was higher than that of our cases. Higher age and parity are risk factors for uterine rupture.

In our study, the PH group (84.6%) and control group (4.1%) patients required transfusion. In the hysterectomy group, hospitalization in ICU and death occurred in 3.8% of patients due to retroperitoneal bleeding caused by ruptured aneurysm of the left renal artery. In consistent with our study, blood transfusion was observed as the most common complication in previous studies. The main complication of PH is transfusion. In Soheila et al. study, the major reported complication was transfusion (97%). Bladder rupture (12.1%), and hospitalization in ICU (6.1%) were the other complications. In Yazdani et al. study, transfusion was administrated for all patients and 84.6% of patients were hospitalized in ICU, 38.9% experienced fever, 15.2% experienced ureteral injury, and rate of deaths were 13.6%. In Gurtani et al. study, death was reported in 17.1% of cases. Nisar et al. found that all the women in need of transfusion, and maternal death was reported in four cases (19%).

In our study, previous cesarean section significantly increased the risk of PH and other variables had no effect on the risk of PH. History of previous cesarean section is related to incidence abnormal placental implantation including placenta previa, and placenta accreta. History of previous cesarean section and repeat cesarean deliveries are the risk factors for PH. It is evident that uterine scarring in cesarean section increases the risk of peripartum hysterectomy, even in the absence of placenta previa and with increased the number of previous cesarean section the risk of PH would be increased. In our study, rate of cesarean section was higher than most of other region which previous studies performed there. Cesarean sections rate in Iran and in Guilan where this study was conducted was reported about 73%.[28] According to Owolabi et al. study, risk factors for hysterectomy were repetitive cesarean and the first time cesarean, age, parity, and multi parity. In Omoke et al. study, women in 31 - 40 years age group, and who were in parity more than five, were at risk for PH. In Nisar et al. study, high parity, previous cesarean section was reported as risk factors for emergency peripartum hysterectomy.

Case control manner of our study is one of strength of our study. All previous studies carried out in Iran were cross-sectional study. Also in this study, we included all hysterectomy performed subsequent to vaginal or cesarean deliveries up to six weeks after delivery. Most of the previous studies only included emergency peripartum hysterectomy.

In this study, we had to use and relay on data recorded in patients’ document that should be considered as a limitation of our study.

CONCLUSION
This study revealed that placenta previa and delayed postpartum hemorrhage can led to PH and should be considered by delivery attendants and clinicians. History of previous cesarean section can increase the risk of PH. Cesarean section is a known risk factor for PH. Policy makers should attempt to design effective programs to reduce the rate of cesarean section.

ACKNOWLEDGMENT
This article was extracted from the MD thesis submitted to the Guilan University of Medical Sciences in Iran. Thanks to the Vice Chancellor of Research of Guilan University of Medical Sciences for supporting this project.

Financial disclosure: The authors declare that this study has received no financial support.

REFERENCES


Case Report

Bilateral Rudimentary Bifid Inferior Turbinate: Report of Two Cases

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Kuwait Medical Journal 2016; 48 (3): 237 - 240

ABSTRACT

Anatomic variations of the inferior turbinate are not seen very often. Bilateral rudimentary bifid inferior turbinate variation was identified in paranasal sinus computed tomography of our two patients with complaints of nasal obstruction. Few variations related to the inferior turbinate are encountered in the literature, but this variation has not been reported to date. We present here, two cases with bilateral rudimentary bifid inferior turbinate.

KEY WORDS: nasal obstruction, nasal turbinate, paranasal sinus, rhinoscopy, septoplasty

INTRODUCTION

Wide use of endoscopic sinus surgery and computed tomography led to the identification of various variations of the nasal turbinates. Most common ones are pneumatization of the middle turbinate (concha bullosa), and paradoxical middle turbinate[1,2]. Less common variations are ranked as accessory middle turbinate, secondary middle turbinate, pneumatized upper and lower turbinates[1,2].

Anatomic variations of the lower turbinates are less common than variations of the middle turbinate. Reported variations about the inferior turbinate include pneumatization, agenesis, hypogenesis and bifidity. Bifid inferior turbinate is an extremely rare encountered variation defined as double inferior turbinates arising from a single root and identified by Aksungur et al for the first time[3]. Bilateral rudimentary bifid inferior turbinate (BRBIT) has not been reported so far in the literature. This report presents two cases of BRBIT in patients complaining of nasal obstruction.

CASE REPORT

Case 1
A 40-year-old male patient was admitted to our clinic with complaints of nasal obstruction. Anterior rhinoscopy examination revealed a nasal septal deviation towards the left side. With endoscopic nasal examination bilateral inferior turbinates were assessed as hypertrophic and there were no polypoid tissues, and secretion. On the paranasal sinus CT, septum was deviated to the left, left inferior turbinate mostly the bony section was hypertrophic, and right inferior turbinate with both bone and soft tissues was detected as hypertrophic compensatory to septum deviation. A rudimentary structure covered with a thin mucosa extending inferiorly and medially was also detected at the lateral nasal wall section, from where both inferior nasal turbinates originated. This structure is thought to remain rudimentary while the development of a secondary inferior turbinate and evaluated as rudimentary bifid inferior turbinate (Fig 1). Absence of uncinate process is often observed with bifid inferior turbinate and therefore, uncinate processes were re-evaluated and patient’s bilateral uncinates were determined as regular and in place (Fig 2). The patient underwent septoplasty. No interference with turbinates was considered. There wasn’t any problem postoperatively. After six months of operation, it was decided to make re-evaluation of the turbinates with control tomography.

Case 2
An 18-year-old female patient presented to our clinic with complaints of nasal obstruction for about three years. With diagnostic nasal endoscopic examination, we observed that nasal septum was

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deviated to the right, mucous membranes were regular, and no secretion in the nasal passage. Right inferior turbinate was hypertrophic. Septum was deviated to the right and right inferior turbinate was found to be hypertrophic on the paranasal sinus CT. Rudimentary structures originated from lateral bony wall were detected extending inferiorly and medially in the right side from the lateral wall and inferiorly in the left side at the beginning of the inferior turbinate (Fig 3). When we looked at the patient’s paranasal sinus CT, the right uncinate process was pneumatized and the left uncinate process was regular (Fig 4). Patient underwent septoplasty and we didn’t apply any surgery to the turbinates. There wasn’t any problem postoperatively.

**DISCUSSION**

Nasal turbinates, are the anatomical structures that are composed of bone and overlying soft tissue and originated from the lateral nasal wall of the nasal cavity. Unlike the other turbinates, embryological development of the inferior turbinate is derived from a structure called maxillo-turbinal and it is a separate bone formation\(^2\). On the other hand, middle superior
Fig 3: Bilateral rudimentary bifid inferior turbinate

Fig 4: Right pneumatized bilateral uncinate process
turbinates and the uncinate process originated from ethmoturbinal structure and are part of the ethmoid bone\(^4\). The groove between the turbinals causes the formation of the recesses and the sinuses. To date, several variations have been described about nasal turbinates. Among these, paradoxical middle turbinate and the middle turbinate pneumatization are of the most common variations\(^1\). Accessory middle turbinate, secondary middle turbinate, pneumatized superior and inferior turbinates are less frequent variations\(^2\). Middle meatus is the critical region at endoscopic sinus surgery and therefore, mostly middle turbinate\(^{3,5}\) have been investigated in various studies. Both in terms of the development and clinically, the inferior turbinate differs from other turbinates. The anatomic variations of the inferior turbinate were reported as pneumatization, agenesis, hypogenesis and bifidity\(^{3,5}\). Bifid inferior turbinate is a variation, which is characterized with both inferior turbinates originated from a single root. In the literature, first of all bifid inferior turbinate was defined by Aksungur et al in 1999\(^3\). From the first identification so far in the literature, a total of six cases of bifid inferior turbinate have been encountered\(^{3,5-9}\). Uncinate process is not often seen in cases of bifid inferior turbinate\(^8\). In the literature, there is only one case published as a real bifid inferior turbinate and existing uncinate process\(^8\). However, when we examined CT scans of this case, the patient had only one inferior turbinate, due to a defect in the middle of the turbinate, it had inferior and superior parts and it was not considered a bifid inferior turbinate. Therefore, bifid inferior turbinate variation is thought to be due medial and inferior rotation of uncinate process\(^8\). Lee et al. reported that the use of accessory inferior turbinate is a more accurate term instead of bifid inferior turbinate\(^8\).

In our cases, apart from normally developing inferior turbinate, a protrusion directed inferiorly and partially medially was observed at inferior turbinates after exiting bilaterally from the lateral nasal wall. This rudimentary structure was covered with a thin mucosa and both uncinate processes regularly existed. It is thought that it would be a true bifid inferior turbinate, if it continued to develop. However, it could not develop and remained rudimentary. It was considered to be appropriate to define this structure as a rudimentary bifid inferior turbinate, which is not reported in the literature.

**CONCLUSION**

Anatomic variations of the inferior turbinate are rarely encountered. Bifid inferior turbinate is seen extremely rare in the literature. Rudimentary bifid inferior turbinate wasn’t described previously in the literature. Bilateral rudimentary bifid inferior turbinate is described in this presentation. In cases admitted with nasal and paranasal complaints and surgical intervention planned, it should be assessed whether there are anatomic variations also at inferior turbinates with endoscopic and paranasal CT evaluation.

**REFERENCES**

Case Report

Hemophagocytic Lymphohistiocytosis in A Newborn Infant Presenting with Nonimmune Hydrops Fetalis: A Case Report

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ABSTRACT

Nonimmune hydrops fetalis is a condition that may result as a cause of many underlying conditions and in around 15% of cases no cause could be identified. Hemophagocytic lymphohistiocytosis had been identified as a rare cause of nonimmune hydrops fetalis in the newborn period in few cases around the world. Here, we reported one case of nonimmune hydrops fetalis born for Saudi parents associated with Hemophagocytic lymphohistiocytosis presented at birth and was born at 32 weeks of gestation. Diagnosis was confirmed by bone marrow aspiration. She was treated with chemotherapy but did not respond to therapy and died. We suggest that Hemophagocytic lymphohistiocytosis should be seriously considered as a cause of nonimmune hydrops fetalis, if the later condition is associated with unexplained cytopenias, high ferritin level, and splenomegaly.

KEY WORDS: cytopenias, hemophagocytic lymphohistiocytosis, high ferritin, nonimmune hydrops fetalis

INTRODUCTION

Hemophagocytic Lymphohistiocytosis (HLH), also known as hemophagocytic syndrome, is a rare hematologic disorder which affects the immune system characterized by abnormal proliferation of macrophages in various tissues and organs causing multi organ failure and often results in death[1]. HLH encompasses several entities, including a primary form that may be familial HLH, with an estimated incidence of one in 50,000 births[2], and a secondary form associated with infections, malignancies, and rheumatologic disorders[3].

Hydrops fetalis is a condition with many underlying causes. Despite advances in ante-natal and post-mortem diagnostic techniques, the cause remains unknown in up to 15% of cases[4].

Hemophagocytic lymphohistiocytosis had been reported as one of the rare causes of non immune hydrops fetalis in few case reports[5-10]. To our knowledge, this is the first reported case in Saudi Arabia.

CASE REPORT

A newborn girl was admitted to our Neonatal Intensive Care Unit (NICU) as a case of non-immune hydrops fetalis which was diagnosed by ante-natal ultrasound. She was delivered by emergency cesarean section at 32 weeks of gestation for a healthy 25 years old, booked Saudi primigravida due to fetal distress. Apgar score was 2, 5, and 7 at 1, 5, and 10 minutes respectively, with birth weight of 2.8 kg. Delivery was attended by three senior neonatologists who conducted full resuscitation for this hydropic baby. Pleural effusion was drained through bilateral thoracentesis, while normal saline boluses were infused via an emergency umbilical venous catheter (UVC). She needed high frequency oscillatory ventilation (HFOV). She developed pneumothorax which was drained via
Generalized improvement was also noted. Atrial septal defect (VSD) was diagnosed for which she was referred to a cardiologist. She was treated empirically with Dexamethasone and intravenous immunoglobulin and showed adequate improvement. Intravenous immunoglobulin and dexamethasone also failed to improve the condition. She was empirically covered with broad spectrum antibiotics after obtaining blood culture. Hemoglobin level remained below 90 g/l and platelets count never exceeds 30 × 10^9/l.

Other investigations for the etiology of hydrops fetalis such as TORCH screen, Parvovirus antibodies, Hepatitis markers, and HIV antibodies all came to be negative. Pediatrics hematology/oncology service was involved in the investigation and management of this case. Serum Ferritin level was 1926.00 μg/L then increased to 6844.00 μg/L two weeks later. Peripheral blood film demonstrated leuko-erythroblastic blood picture. Neutrophilia with left shift and some toxic changes were evident. RBC morphology reveals some degree of anisopoikilocytosis and polychromasia. Severe thrombocytopenia was confirmed. B and T lymphocytes subsets were low. Bone marrow aspiration was done and revealed hypercellular particles with hypercellular trails that show adequate megakaryocytes with occasional coarse basophil granulations. Erythropoiesis looks essentially normoblastic and shows progressive maturation sequences. Granulopoiesis looks adequate and reveals slight left shift. M: E ratio 3.9:1. Blasts account for 3% of all nucleated cells. Macrophages were prominent with obvious hemophagocytosis involving mostly erythroid cells and platelets. Some hemophagocytic cells were in clusters and some in single form all over the marrow aspirate smears (Fig. 1, 2). Iron stain: Stainable iron stores. Iron was markedly increased with adequate erythron iron and no ring sideroblasts. With these findings, it was concluded that this hypercellular bone marrow aspirate showed adequate lineage hematopoietic elements with prominent phagocytic activity. These findings were compatible with the diagnoses of hemophagocytic Lymphohistiocytosis (HLH).

Henceforth, she was started on triple drug regimen Cyclosporin, IV Immunoglobulin and Dexamethasone and showed progressive but transient response. Baby’s general condition progressively deteriorated despite full and aggressive management until she had fulminant gram negative septicemia which eventually led to her death at the age of 44 days.

**DISCUSSION**

We described a newborn baby who presented to us as a case of non-immune hydrops fetalis and was treated accordingly. This is the first time in our practice to see unusual course for such neonates as she persistently had bicytopenia despite our aggressive management. Her pleural effusion and pneumothorax eventually resolved within four days. Echocardiogram was done as part of evaluation for hydrops fetalis and showed partial atrio-ventricular septal defect, large atrial septal defect (ASD) secundum, small muscular ventricular septal defect (VSD), and large patent ductus arteriosus (PDA). She also developed severe suprasystemic persistent pulmonary hypertension (PPHN). The impression of our cardiologist is that these findings cannot explain the etiology of hydrops fetalis for this baby. Renal ultrasound was normal. Generalized edema resolved gradually with the use of diuretics and fluid management. Physical examination revealed Splenomegaly which was persistent throughout her hospital course.

Initial CBC showed WBC count of 35.65 × 10^9/l, Hemoglobin was 124 g/l, and low platelet count of 19 ×10^9/l. Subsequent CBC results showed persistent anemia with marked thrombocytopenia for which multiple transfusions of platelets and packed red cells were given, but failed to show acceptable improvement. Intravenous immunoglobulin and dexamethasone also failed to improve the condition. She was empirically covered with broad spectrum antibiotics after obtaining blood culture. Hemoglobin level remained below 90 g/l and platelets count never exceeds 30 × 10^9/l.

![Fig. 1: Bone marrow slide showing single hemophagocytic histiocyte containing depriv in its cytoplasm.](image1)

![Fig. 2: Bone marrow slide showing many hemophagocytic histiocytes in clusters containing cellular depriv in their cytoplasm.](image2)
intervention, although there was great improvement in pleural effusion and ascites as well as generalized edema. The presence of persistent bicytopenia raised our suspicion of dealing with a rare cause of hydrops fetalis that could be related to a disease affecting cell proliferation. After seeing the results of bone marrow aspiration we searched the literature to find if there is association between hydrops fetalis and hemophagocytic Lymphohistiocytosis and we found few reported cases. 

According to HLH-2004 protocol for diagnostic guidelines, diagnosis of HLH can be established after fulfillment of either one or two of the following criteria: A molecular diagnosis consistent with HLH, and/or Fulfillment of five out of eight of the following diagnostic criteria (Fever, Splenomegaly, Cytopenias affecting ≥ 2 of 3 lineages in the peripheral blood Hypertriglyceridemia and/or hypofibrinogenemia, Hemophagocytosis in bone marrow or spleen or lymph nodes, Low or absent NK-cell activity, High ferritin, High CD 25 (soluble IL-2 receptor]).

Our patient fulfilled the criteria for the diagnosis of HLH as she presented with cytopenias, splenomegaly, low B and T lymphocyte subsets, high ferritin level, and hemophagocytosis in bone marrow.

Around 10% of cases with HLH present within the first month of life, often after a symptom-free period. However, presentation in the first day of life seems to be rare. Natural killer cell activity, T-lymphocyte mitogen response, antibody-dependent cellular cytotoxicity, and interleukin-1 and interferon production are all diminished. The lymphoproliferative disorder of HLH can be divided into two categories: primary (familial) hemophagocytic lymphohistiocytosis (FHL) with an incidence of 1:50,000 births and equal gender distribution, and secondary HLH which may affect any age and may resolve spontaneously. FHL is seen primarily in children and is fatal if untreated, with most cases diagnosed before two years of age, and the disease may present in the newborn period. HLH may be due to an immunoregulatory defect that predisposes to an uncontrolled production of activated histiocytes in response to a stimulus such as a viral infection. The aim of current treatment protocols is to achieve remission with immune-chemotherapy, followed by a cure with bone marrow transplantation.

CONCLUSION

We conclude from this case that hemophagocytic lymphohistiocytosis (HLH) should be considered as a possible cause of nonimmune hydrops fetalis in hydropic newborns presenting with persistent unexplained bicytopenia, splenomegaly, and high serum ferritin especially when no metabolic or infectious cause is found. Diagnosis of HLH purely by clinical presentation in newborn period is difficult. Establishment of the diagnosis by appropriate investigation tools such as bone marrow aspiration is mandatory for parent’s counseling and initiation of therapy.

REFERENCES

Case Report

A Pediatric Case of Acute Pancreatitis as Initial Manifestation of Primary Hyperparathyroidism

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Kuwait Medical Journal 2016; 48 (3): 245 - 248

ABSTRACT

The etiology of primary hyperparathyroidism usually involves a single parathyroid adenoma or, less frequently, multiple parathyroid adenomas associated with genetic syndromes. A 14-year-old female patient diagnosed with acute pancreatitis after presenting with vomiting, abdominal pain and waist pain was evaluated. Her physical examination resulted in no relevant findings other than abdominal tenderness. Laboratory investigations yielded the following: calcium: 12.3 mg/dL, phosphate: 2.8 mg/dL, ALP: 368 U/L, PTH: 852 pg/mL, amylase: 1,508 U/L, ALT: 18 U/L, BUN: 30 mg/dL, creatinine: 0.8 mg/dL. Further investigations demonstrated the following: serum 25-OH-D: 5.3 ng/dL, urinary calcium/creatinine ratio: 1.21. Neck ultrasonography was consisted with parathyroid adenoma, sized 2x1 cm, at the posterior side of the thyroid parenchyma of the right thyroid lobe. Scintigraphic examination was reported as the nodular appearance being consistent with parathyroid tissue. Surgical removal was performed on the nodular structure of parathyroid tissue origin. The result of the pathologic investigation of the excised parathyroid nodule was consistent with parathyroid adenoma. An adolescent patient with primary hyperparathyroidism associated with isolated parathyroid adenoma is being presented herein since this is a rare condition in childhood.

KEY WORDS: primary hyperparathyroidism, acute pancreatitis, child

INTRODUCTION

Primary hyperparathyroidism (PHPT) is a rare condition in children and adolescents[1]. It is often reported in the literature as small patient series or reports of single cases[2-13]. Complications including symptomatic hypercalcaemia or renal calculi, abdominal pain, increased bone brittleness are more frequent in children with primary hyperparathyroidism compared to adults[1]. Few patients are identified during investigations for hypercalcaemia. The aetiology of primary hyperparathyroidism in childhood usually involves a single parathyroid adenoma. However, though less frequently, multiple parathyroid adenomas associated with genetic syndromes (parathyroid hyperplasia) may also be observed. Patients with parathyroid hyperplasia should be investigated for familial multiple endocrine neoplasia (MEN)[14]. Familial hypocalciuric hypercalcaemia (FHH) should also be considered in the differential diagnosis of patients with clinical manifestations of primary hyperparathyroidism[15]. An adolescent patient with primary hyperparathyroidism associated with isolated parathyroid adenoma who presented with acute pancreatitis is being presented herein.

CASE REPORT

A 14-year-old female patient, was referred to our hospital by the healthcare centre. She presented with vomiting, abdominal pain, and was diagnosed with acute pancreatitis. She had dyspeptic complaints for about 2 - 3 years, but the vomiting and waist pain which started two days back made her seek medical attention. Her history included no relevant conditions except for appendectomy which she underwent at the age of 12. When familial history was questioned, there were no...
family members with similar clinical manifestations or history of renal calculi. At the time she presented to the hospital, she was conscious, cooperative and stable, with a temperature of 36.7 °C, heart rate: 102/min, blood pressure: 90/60 mmHg. Auxological findings were as follows: body weight: 48.0 kg (-1.00 SDS), height: 153.2 cm (-1.36 SDS), body mass index: 20.5 (-0.12 SDS). Her physical examination resulted in no relevant findings other than abdominal tenderness. Laboratory investigations yielded the following: calcium: 12.3 mg/dL (normal range 8.5 – 10.8 mg/dL), phosphate: 2.8 mg/dL (normal range 2.6 – 4.5 mg/dL), ALP: 368 U/L (normal range 82 – 564 U/L), PTH: 852 pg/mL (normal range 20 – 74 pg/mL), amylase: 1,508 U/L (normal range 20 – 564 U/L), AST: 44 U/L, ALT: 18 U/L, BUN: 30 mg/dL, creatinine: 0.8 mg/dL, haemoglobin: 14.9 g/dL, platelets: 544,000 /mm³, WBC: 12,450 /mm³. The patient was admitted for inpatient care for acute pancreatitis secondary to hypercalcaemia. Intravenous hydration, diuretic and antibiotic treatment was started. Laboratory findings as monitored during the clinical course of the patient are summarized in Table 1. Diagnosed as primary hyperparathyroidism based on the available findings, the patient’s further investigations demonstrated the following: serum 25-OH vitamin D: 5.3 ng/dL (normal range 20 – 80 ng/dL), urinary calcium/creatinine ratio: 1.21 (normal ratio < 0.2). Neck ultrasonography was consistent with parathyroid adenoma, sized 2 x 1 cm, at the posterior outside the thyroid parenchyma at the inferior section of the right lobe. Scintigraphic examination of the parathyroid gland was reported as the nodular appearance being consistent with parathyroid tissue (Fig 1). Lumbar L1-L4 vertebral bone mineral density was measured as 0.849 g/cm² (Z-score: -0.70) with “Dual-energy X-ray absorptiometry”. Direct bone X-ray images did not demonstrate PHPT-associated bone lesions. Nephrolithiasis or nephrocalcinosis was not noted with the ultrasonographic examination of the urinary system. Other relevant laboratory investigations are shown in Table 2. Pituitary MRI showed a normal gland. MR cholangiopancreatography demonstrated no nodular structure in the pancreas. She was started on a maintenance dose of 1,000 units/day of cholecalciferol. Surgical removal was performed on the nodular structure of parathyroid tissue origin.

Table 1: Patient’s laboratory data

<table>
<thead>
<tr>
<th>Variables</th>
<th>Normal Ranges</th>
<th>Time before presentation</th>
<th>At presentation</th>
<th>Pre-operatively</th>
<th>Post-operatively</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>4 years</td>
<td>3 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium (mg/dL)</td>
<td>8.5 - 10.8</td>
<td>9.9</td>
<td>12.0</td>
<td>12.3</td>
<td>11.9</td>
</tr>
<tr>
<td>Phosphate (mg/dL)</td>
<td>2.6 - 4.5</td>
<td></td>
<td></td>
<td>2.8</td>
<td>1.9</td>
</tr>
<tr>
<td>Magnesium (mg/dL)</td>
<td>1.7 - 2.7</td>
<td></td>
<td></td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>ALP (U/L)</td>
<td>82 - 564</td>
<td></td>
<td>368</td>
<td>424</td>
<td>661</td>
</tr>
<tr>
<td>PTH (pg/mL)</td>
<td>20 - 74</td>
<td></td>
<td>852</td>
<td></td>
<td>661</td>
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<tr>
<td>25 OH Vit D (ng/mL)</td>
<td>20 - 80</td>
<td></td>
<td></td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td>Amylase (U/L)</td>
<td>28 - 100</td>
<td></td>
<td>1508</td>
<td></td>
<td>397</td>
</tr>
<tr>
<td>Lipase (U/L)</td>
<td>7 - 60</td>
<td></td>
<td>112</td>
<td></td>
<td>226</td>
</tr>
</tbody>
</table>

Fig 1: The anterior views of parathyroid scintigraphy with 99mTc-sestamibi show a solitary adenoma located at the lower right lobe of the thyroid gland.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Normal range</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastrin (pg/mL)</td>
<td>13 - 115</td>
<td>&lt;10</td>
</tr>
<tr>
<td>Glucose (mg/dL)</td>
<td>75 - 115</td>
<td>103</td>
</tr>
<tr>
<td>Insulin (uIU/mL)</td>
<td>2.6 - 24.9</td>
<td>13.3</td>
</tr>
<tr>
<td>Calcitonin (pg/mL)</td>
<td>&lt;11.5</td>
<td>&lt;2.0</td>
</tr>
<tr>
<td>Free T4 (ng/dL)</td>
<td>0.93 - 1.71</td>
<td>1.42</td>
</tr>
<tr>
<td>TSH (mIU/L)</td>
<td>0.5 - 5.5</td>
<td>1.10</td>
</tr>
<tr>
<td>Prolactin (ng/mL)</td>
<td>3.4 - 24.1</td>
<td>10.8</td>
</tr>
</tbody>
</table>

Table 2: Results of laboratory tests for syndromes associated with primary hyperparathyroidism
Intravenous calcium gluconate was given for postsurgical hypocalcaemic symptoms after which treatment with oral elemental calcium at 2 g/day and calcitriol at 0.5 mcg/day was started. With stable serum calcium levels, the patient was discharged on day 8 post-surgery. The result of the pathologic investigation of the excised parathyroid nodule was reported as consistent with parathyroid adenoma.

**DISCUSSION**

Primary hyperparathyroidism in children is rare with an estimated incidence of 2 - 5 in 100,000. Among adults, PHPT is more common in women however, the incidence in the paediatric age group shows no gender difference. PHPT is commonly associated with parathyroid adenoma in children and adolescents[1].

Genetic syndromes including familial isolated hyperparathyroidism, hyperparathyroidism-jaw tumour syndrome, MEN-1, MEN-2a, familial hypocalciuric hypercalcaemia can cause PHPT in children in up to 5 - 15% of cases [1]. Multiple endocrine neoplasia syndrome type 1 is the most common hereditary cause of PHPT. It is observed in more than 90% of the patients with primary hyperparathyroidism and the typical age for the onset of PHPT signs is between 20 and 25 years[14]. Apart from primary hyperparathyroidism, 60 - 70% of patients with MEN-1 present with pancreas islet cell tumors and 15 - 42% with pituitary tumors. Primary hyperparathyroidism is relatively less common in patients with MEN-2a, occurring in 20-30% of the patients. In addition to PHPT, medullary thyroid cancer and phaeochromocytoma are observed in multiple endocrine neoplasia type 2a. Primary hyperparathyroidism hardly occurs in MEN-2b[14]. Laboratory and imaging analyses of our patient demonstrated no additional findings which could be associated with the MENs. Familial hypocalciuric hypercalcaemia is another genetic syndrome that may be associated with PHPT. Patients with familial hypocalciuric hypercalcaemia are usually asymptomatic. Hypercalcaemia and hypophosphataemia levels are similar in patients with mild PHPT, whereas PTH levels are measured as normal or slightly elevated. Unusually elevated PTH levels in the presence of hypercalcaemia indicate a threshold value for PTH secretion that is higher than the normal in the parathyroid gland. Unlike patients with primary hyperparathyroidism, patients with FHH have elevated serum magnesium levels. The key to this clinical presentation is the very low calcium elimination despite the presence of hypercalcaemia: fractioned calcium elimination is usually below 1%. Another genetic syndrome which may be linked with PHPT is hyperparathyroidism-jaw tumor syndrome. This rare condition caused by HRPT2 gene mutation has an autosomal-dominant inheritance. Beside the parathyroid adenoma, it is characterized by fibrosseous lesions of maxillary and mandibular involvement[14]. Periodical assessments for PHPT-associated syndromes were scheduled for our patient.

Patients with primary hyperparathyroidism are known to be asymptomatic or to manifest very few signs at the time of diagnosis. However, bone abnormalities (decreased bone mineral density, fractures, osteitis fibrosa cystic) are observed in 75% and nephrocalcinosis and renal calculi disorder in 45% of these patients[1]. About 17% of the patients present with abdominal pain and/or vomiting[1]. The cause of abdominal pain may be stomach hyperacidity or constipation. The patients may seek medical attention for acute pancreatitis due to the end-organ effect of primary hyperparathyroidism-associated hypercalcaemia. Acute pancreatitis has been reported to be present in 9% (7/82) in children and adolescents with primary hyperparathyroidism[5,7,11]. Polyuria, cognitive or psychiatric disorders may also be seen. Our patient was diagnosed following acute pancreatitis which developed after obscure complaints persisting for about two years.

A single surgical intervention is the definitive treatment method for many children with primary hyperparathyroidism. However, multiple surgeries may be required in patients with MEN-1. 99mTc-Sestamibi scanning and/or neck ultrasonography is performed pre-operatively to identify parathyroid adenoma. Around 60 - 80% of parathyroid adenomas are identified with Sestamibi scanning. “Single-photon emission” computed tomography (3-d), another diagnostic method, may be useful particularly in the diagnosis of small parathyroid adenomas or adenomas of ectopic involvement. Many healthcare centres confirm successful parathyroidectomy by measuring intraoperative PTH levels to proceed with minimal invasive parathyroid surgery. Possible postoperative complications have been reported as acute hypercalcaemia (49%), hungry bone syndrome (49%), surgical failure (12%), persistent hypercalcaemia (4%), and persistent hypocalcaemia (2%)[1]. In our patient, acute hypercalcaemia observed on postoperative day 1 was treated with parenteral calcium. In patients with significant hyperparathyroidism, presence of hypocalcaemia persists for more than four days postoperatively is defined as hungry bone syndrome. Advanced age, low 25 (OH)D, low 1 – 25 (OH)D, presence of preoperative PHPT-associated bone lesions, the volume and mass of the surgically resected parathyroid tissue are reported risk factors for occurrence of hungry bone syndrome[17]. Our patient had no PHPT-associated bone lesions and was treated with oral cholecalciferol at an empirical dose.
for low 25(OH)D levels measured pre-operatively. Oral calcium replacement and calcitriol treatment was initiated after acute hypocalcaemia which developed following surgery and hungry bone syndrome was not observed for the patient.

CONCLUSION
This adolescent patient with primary hyperparathyroidism associated with isolated parathyroid adenoma is being presented herein since this is a rare condition in childhood. A small number of cases with primary hyperparathyroidism may present with acute pancreatitis. The investigations to find etiology of hyperparathyroidism should include studies for genetic syndromes which were associated with primary hyperparathyroidism.

REFERENCES
Case Report

Epistaxis: Bizarre Manifestation of Renal Cell Carcinoma with Vena Cava Thrombosis and Metastasis to Pancreas

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Kuwait Medical Journal 2016; 48 (3): 249 - 252

ABSTRACT

Renal cell carcinoma has an unpredictable clinical course, with metastatic potential that is variable over time and in location. The most frequent metastatic sites are lung, regional lymph nodes, bone, and liver. Clinical manifestations of renal cell carcinoma may be bizarre. It should be kept in mind that sometimes presentation may be due to the manifestations of the occult metastases. We present a very rare case of renal cell carcinoma metastasis to nasal cavity with concomitant pancreas metastasis and extension into the vena cava.

KEY WORDS: nasal cavity, neoplasm metastasis, renal cell carcinoma

INTRODUCTION

Renal cell carcinoma (RCC), particularly clear cell carcinoma, has an unpredictable clinical course, with metastatic potential that is variable over time and in location. RCC represents about 3% of all adult malignancies. The most frequent metastatic sites are lung (76%), regional lymph nodes (66%), bone (42%), and liver (41%), and it is the third most common infracavicular neoplasm to metastasize to head and neck\(^1\). The occurrence of RCC metastasis to the head and neck region is extremely rare. Six percent of atypical locations are ENT and the three most frequent sites are the thyroid, sinus and parotid gland\(^2\). Some authors have reported metastasis of RCC to the parotid glands, nose and paranasal sinus, tongue, larynx, thyroid and palatine tonsil\(^3\). Sometimes presentation may be due to the occult metastases manifesting with nasal symptoms which lead to the diagnosis of primary tumor.

Here we describe, a patient with epistaxis diagnosed to bleed from a nasal polyp and turned out to be a left renal cell carcinoma with vena cava thrombosis and pancreatic metastasis.

CASE REPORT

A 60-year-old male presented with epistaxis to the ENT outpatient clinic. He was diagnosed to have a nasal polyp and offered surgery. He had mild hypertension with no previous urologic complaints and no hematuria, however his preoperative evaluation revealed an incidental left renal mass on ultrasonography. Further evaluation with CT of abdomen disclosed a huge left renal mass with a thrombus extending into vena cava with no other visceral involvement (Fig 1). Chest X-ray and bone scan were negative for metastatic work-up. Left radical nephrectomy with extraction of vena cava thrombus was recommended. A solid mass of 3 cm at the tail of pancreas was discovered intraoperatively during dissection of the upper pole of the kidney. Distal partial pancreatectomy was carried out as well as left radical nephrectomy with a 5 cm subhepatic thrombus extraction from vena cava inferior. During convalescence, a delayed fluid collection at the operation site developed and was drained percutaneously. Pathologic examination of kidney revealed renal cell carcinoma (clear cell) with similar pathology in the resected pancreatic gland.

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Final diagnosis was clear cell RCC of left kidney with vena cava thrombosis and pancreatic metastasis. Thereafter, the patient underwent an uncomplicated nasal polyp resection and surprisingly pathology disclosed a clear cell RCC metastasis (Fig 3). Following a month of recovery period, interferon-alpha was initiated prior to administration of multitargeted tyrosine-kinase inhibition therapy due to social security politics. He received sunitinib 50 mg PO four weeks followed by two week rests (schedule 4/2) and is on follow up for two years without sign of recurrence.

DISCUSSION

Renal cell carcinoma is characterized by varied and sometimes obscure manifestations, which include unusual metastatic sites and paraneoplastic and vascular syndromes. Recognition of unusual manifestations of RCC is important because these syndromes may lead to the diagnosis.

Nasal malignant tumors are usually primary and account for 0.3% of all neoplasms and 3% of all head and neck neoplasms\(^4\). Occasionally, metastatic sinonasal tumors from infraclavicular sites, mainly the kidneys and to a lesser degree, the lungs and breast may manifest with nasal symptoms\(^5\). A hundred and five cases of maxillary metastases and 21 cases of ethmoid metastases from RCC have been reported in 2003 and new cases have been described since then\(^6\).
RCC is a slowly growing tumor and unless a considerable size is reached clinical manifestations do not occur. Consequently, many small and asymptomatic RCCs are incidentally detected on ultrasound examination performed for other causes. Thirty percent of patients present with a distant metastasis and only 10% exhibit the classical presentation of the tumor with flank pain, palpable mass and gross hematuria\(^7\). Distant metastases of RCC characteristically occur in the lungs, brain, liver, adrenal glands and bones\(^1\). Supravacular metastases usually occur in the thyroid gland, brain and very rarely the nose and paranasal sinuses.

Two potential routes have been proposed for the hematogenous spread of RCC to the sinonasal region: a) the route that follows the inferior vena cava, lungs, heart and the maxillary artery, in which case concurrent lung or brain metastasis may be present, and b) the route through the communication of the aivalcular vertebral venous plexus and the intracranial venous plexus; in such case the sinonasal region may be the only site of metastasis\(^8\).

Sinonasal metastases presenting with epistaxis are rare in clinical practice. Systematic evaluation for primary tumor investigation for these metastatic deposits should include kidney (50%), lungs, breast, gastrointestinal tract, urogenital ridge and thyroid gland\(^9\). RCC metastases to the nasal cavity and paranasal sinuses should be included in the differential diagnosis of nasal bleeding lesions. Biopsy and resection of such lesions may result in profuse bleeding and, therefore, preoperative embolization is recommended. RCC sinonasal metastasis signifies advanced disease with compromised survival. The frequency of nasal metastases in patients with metastatic RCC is about 1%, occurring predominantly in patients with clear cell RCC. Nasal metastases are associated with poor prognosis as estimated by the MSKCC risk classification, with attendant implications for selection of targeted therapy, and are usually associated with multi-organ dissemination including concurrent lung and bone involvement\(^10\). First-line treatment for ENT lesions is surgical, due to low radiosensitivity, with radiation therapy as a possible second line\(^2\). Metastatic RCC is resistant to radiotherapy and chemotherapy although a variable response has been reported\(^7\). According to the ‘The National Comprehensive Cancer Network’ practice guidelines for kidney cancer, patients with a resectable primary tumor and a single metastasis or post-nephrectomy patients who develop a metachronous metastasis may benefit from nephrectomy and metastasectomy respectively\(^11\). If the primary tumor is potentially resectable but multiple metastases coexist, cytoreductive nephrectomy and systemic therapy is likely to be of benefit.

Various articles describe sole metastases of RCC to nasal cavity and paranasal sinuses even decades after the removal of the primary tumor\(^1,3,5,6,9,10\). Though this case we describe is similar with literature as the presentation of epistaxis due to an unusual metastasis of RCC, it is distinctive with concomitant vena cava thrombus and pancreatic metastasis. In accordance with previous reports, he did not have symptoms or signs of a renal mass, which was diagnosed, as usual, incidentally on preoperative ultrasound exam for his hypertension. Yet, the pancreatic metastasis could only be discovered during surgical intervention. It should be kept in mind that epistaxis may be the consequence of a metastatic lesion to the sinonasal region and preoperative evaluation is crucial for proper diagnosis. Although it is unusual for RCC to metastasize to the head and neck region it is prudent to incorporate evaluation of kidneys within the work-up for the primary of such lesions.

Surgery stands the main therapeutic approach in dealing with renal cell carcinoma patient. Attempts for identification and excision of each and every solitary metastasis should be carried out. With the introduction of tyrosine-kinase inhibition therapy better management outcomes can be expected as in this unusual case.

**CONCLUSION**

Clinical manifestations of renal cell carcinoma may be bizarre. It should be kept in mind that sometimes presentation may be due to the manifestations of the occult metastases. Radical surgery in conjunction with removal of metastatic lesions still remains the basis for successful management of renal cell carcinoma.

**REFERENCES**

Case Report

Cellulitis and Sepsis Caused by Group A Streptococcus in Saudi Neonate: Case Report

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Kuwait Medical Journal 2016; 48 (3): 253 - 254

ABSTRACT

We report a 40 day-old infant with late onset group A cellulitis and sepsis presented with fever and neck swelling with redness and tenderness. He was seriously affected and ventilated. Group A streptococcus (GAS) was isolated from blood within 24 hours. He was dramatically improved with proper antibiotics and discharged home in good condition. Mother was healthy. We believe that the source of GAS was one of his brothers with tonsillitis, but no evaluation was done to confirm it.

KEY WORDS: cellulitis, group a streptococcus, neonatal

INTRODUCTION

A Streptococcal sepsis caused by group A Streptococcus is one of the major causes of neonatal infections[1]. It can lead to serious Cellulitis and sepsis. The objective of reporting this case is to be aware of this infection and the need for immediate implementation of an aggressive treatment.

CASE REPORT

A 40-day-old male infant was admitted to our neonatal intensive care unit (NICU) with one day history of fever (38.6 °C axillary) associated with lethargy and poor feeding after being completely healthy. Followed next day by rapidly progressive submandibular swelling with redness (Fig 1).

He was a product of 36-week pregnancy for 32 years old gravida 4 para 3, healthy, Un-booked Saudi lady with un-eventful pregnancy and normal antenatal ultrasound. No history of prolonged rupture of membrane (PROM), delivered by normal spontaneous vaginal delivery with birth weight of 2.3 kg and normal Apgar scores. He was kept at NICU for 10 days after birth for borderline prematurity and discharged in normal condition after receiving routine vaccination. He was breastfed and mother was healthy. One of his brothers had tonsillitis five days prior to admission.

Examination revealed sick-looking infant with mottled skin and diffused neck swelling with redness, warm to touch with some tenderness, and no fluctuation. The infant was sick to the extent that he required mechanical ventilation. Full septic screen was done including cerebrospinal fluid culture and was started on vancomycin, cefotaxime, and clindamycin pending cultures results. C-reactive protein was very high (123 mg/L). CBC showed WBC count of 10 × 10⁹ with 72% polymorphs. CSF result was normal as well as urine culture. Blood culture showed growth of group A Streptococcus (GAS) within 24 hours of admission. GAS was sensitive to clindamycin, Penicillin G, Ampicillin, and Cephradine. The infant was shifted to Penicillin G. He showed good response to treatment and was extubated within six days, and was eventually discharged home in good condition.

DISCUSSION

Before the introduction of antibiotics, group A streptococcal sepsis (GAS) was one of the major causes of neonatal infections, the incidence of which reduced after antibiotic era[1]. Group B streptococci and Escherichia coli have replaced GAS as the major causes of neonatal sepsis since the establishment of antimicrobial therapy[2]. The mortality rate of invasive
GAS disease in neonates remains high despite decline in its incidence\(^3\). Most of the reported cases of invasive GAS in neonates were of early onset (<5 days) rather than late onset (>5 days)\(^4\).

The case we presented in this report was of late onset neonatal cellulitis and sepsis caused by GAS, and we suspect that GAS was most likely acquired from the child’s 5-year-old brother who was suffering tonsillitis around the period of sickness of this child. Unfortunately, we did not investigate the brother to confirm the source of GAS in our patient. To the best of our knowledge, this is the first case of GAS causing neonatal cellulitis reported in Saudi Arabia. In fact, it is considered as a rare presentation worldwide, with mothers as the usual source of infection\(^5\).

**CONCLUSION**

The presence of neonatal cellulitis should be taken seriously and dealt with as serious invasive disease of neonates that can be often associated with sepsis. Full septic workup and immediate use of intravenous broad-spectrum antibiotics must be performed for all neonates with similar presentation of our case. Group A streptococcus should be considered as one of the organisms that can cause serious invasive neonatal cellulitis and sepsis since there are reported cases in the literature. Mothers should be carefully evaluated looking for the source of GAS. Other members of the family and close contacts of neonates with GAS should also be carefully evaluated by conducting proper inquiries and performing proper investigations for suspected cases.

**REFERENCES**

ABSTRACT

Hydatid disease is a parasitic infection by a tapeworm of the genus Echinococcus. The kidneys’ involvement is less than 2% of all human hydatidosis. Morbidity is usually secondary. The diagnosis is established based on the clinical and radiological findings and was confirmed by open surgery and histopathology.

KEYWORDS: echinococcal cyst, kidney, parasitic infection

INTRODUCTION

Hydatid cyst is a parasitic infection caused by the larvae of Echinococcus tapeworms. The kidneys’ involvement is very rare (less than 2% of all human hydatidosis\(^1\)). Morbidity is usually secondary to free rupture of the echinococcal cyst (with or without anaphylaxis), infection of the cyst, or dysfunction of affected organs\(^2\). It is endemic to many sheep- and cattle-raising regions of the world, including the Middle East, Mediterranean, Africa, South America\(^3\).

Primary cyst location in the kidney is less than 2% of all cases, it may localize anywhere in the body but commonly they are found in the liver and lungs\(^4\). Herein, we report a case of isolated renal involvement with a giant hydatid cyst.

CASE REPORT

A 31-year-old unmarried Asian male, non smoker, with no previously significant medical and/or surgical history presented with recurrent low grade fever, vomiting and left hypochondrial pain since two weeks.

Clinical examination revealed temperature was 38 °C and palpable firm left hypochondrial mass four fingers below costal margin. Serum creatinine was high 129 umol/L, leucocytosis 13 x 10^9/L, Hb: 16.3 mg/dl and normal liver function tests. Urine examination revealed abundant RBCs, stool analysis revealed Ascaris parasites, negative mono-spot and coomb’s test and Chest X-ray did not reveal any abnormality.

Ultrasonography revealed about 10 x 15 cm cystic mass lesion at left postero-inferior renal wall suggestive of hydaid cyst of kidney. Patient initially managed conservatively till renal function returned normal then underwent abdomino-pelvic CT with IV contrast which revealed 10.3 x 16 x 7 cm cystic mass at the left postero-inferior renal wall causing antero-medial displacement of left kidney. It shows internal floating membrane (water lily sign) associated with relative decrease attenuation of adjacent renal parenchyma with peri-renal and pericystic fat stranding and fluid collection extending to left iliac fossa and normal other abdominal structures.

Indirect heam-agglutination test was 1: 32 (non significant). Patient was treated by albendazole tablet 400 mg twice daily, two weeks later cystoscopy and left retrograde pyelography showed abnormal appearance of the left renal collecting system, with marked infundibular splaying due to the large left-lower-pole mass, but without any direct communication, then left flank incision and extra peritoneal total cystectomy and peri-cystectomy performed with smooth post-operative course. The patient also was continued on three cycles of medical treatment with albendazole (3 weeks for each cycle with two weeks interval).

DISCUSSION

The echinococcosis infection can involve any organ. The liver is the most common organ involved (63%),
followed by the lungs (25%), muscles (5%), bones (3%), kidneys (2%), brain (1%), and spleen (1%)\(^5\).

The diagnosis established by ultrasonography and computed tomography (Fig 1). The immunological tests for detection of anti-echinococcal antibodies can be undertaken to support the diagnosis. In doubtful cases, particular technique called ELISA (Enzyme Linked Immuno Sorbent Assay) has a high specificity and accuracy\(^6\). In our case, the diagnosis was confirmed with microscopic examination, which revealed the cyst wall consisted of an outer pericyst, middle laminated membrane, and an inner germinal layer with presence of multiple scolices and hooklets along this laminated thin membrane (Fig 2). Histologic features of the renal parenchyma were normal. No internal projections or solid structures were identified.

The open surgical approach is applied for giant cysts and consists of: neutralization of the parasite, evacuation of cystic components, treatment of the pericystic cavity and management of communications with urinary tract, if present\(^7,8\). In our case, the extra peritoneal approach was preferred in order to avoid intra peritoneal dissemination. The abdomen was protected with gauze packs around the cyst to reduce the peritoneal contamination risk. Once aspirated, the cavity is sterilized with antiscocoidal agents (hypertonic solutions 20%) and the cyst is unroofed and drained (Fig 3). There are more aggressive operations such as partial or simple nephrectomy and total pericystectomy that often cause immunologic reactions, infection of renal parenchyma and postoperative leakage\(^9\), but in our case we could do a successful nephron sparing surgery.

Medical therapy with mebendazole or albendazole is used as prophylaxis and postoperatively to prevent recurrences. Preoperative medical therapy should be initiated at least 4-10 days before the operative procedure and continued for at least a month or preferably several months postoperatively\(^10\).

Our patient was monitored with a CBC count, renal function tests, ultrasonography for abdomen and pelvis monthly for the first three months and then every six months for three years without any evidence of recurrence.

CONCLUSION

A giant and isolated renal hydatid renal cyst can be safely and effectively managed surgically with a nephron-sparing technique, and characteristic
imaging findings with a history of living in an endemic region are strongly suggestive of the diagnosis.

REFERENCES

Case Report

Coupled Plasma Filtration Adsorption (CPFA) in Thyroid Storm

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Nephrology Unit, Department of Internal Medicine, Universiti Kebangsaan Malaysia Medical Centre, Malaysia

Kuwait Medical Journal 2016; 48 (3): 258 - 261

ABSTRACT

Thyrotoxic crisis can occasionally be refractory to standard therapy. Extracorporeal measures such as plasmapheresis are sometimes needed to remove the excess circulating thyroid hormones. Coupled plasma filtration adsorption (CPFA) is an extracorporeal blood purification therapy which uses a resin that non specifically adsorbs inflammatory mediators, cytokines and some proteins. Herein, we describe a case report of 45 year old man with Graves’ disease who presented with thyroid storm and pulmonary oedema. Despite standard therapy, he remained in thyroid storm and therefore, CPFA was performed. Twenty four hours after CPFA, partial clinical improvement in the thyroid status was observed. This resulted in significant clinical improvement in terms of the heart rate and ability to taper and eventually wean off inotropic support.

KEY WORDS: hyperthyroidism, plasmapheresis; plasma exchange, thyrotoxic crisis

INTRODUCTION

Thyrotoxic crisis (thyroid storm) is a life threatening condition that occurs in patients with newly diagnosed or inadequately treated hyperthyroidism[1]. It is usually triggered by sepsis, surgery or physical stress but can also occur with the use of radioiodine therapy in an unprepared hyperthyroid patient. Common clinical manifestations include fever, tachycardia, atrial fibrillation or circulatory collapse with hypotension, gastrointestinal and neurological manifestations[2]. Standard therapy in the acute phase is based on thiamazoles, Lugol’s iodine, corticosteroids and non selective beta-blockers. Mortality is high in thyroid storm and is predominantly due to cardiac failure and circulatory collapse[2]. In refractory cases that do not respond to standard therapy, extracorporeal measures such as plasmapheresis can be used to remove the excess circulating thyroid hormones[3].

Thyroid hormones are bound to plasma proteins, so haemodialysis is ineffective. There are several case reports of plasmapheresis being used for thyroid storm successfully, as it removes protein-bound substances including thyroid hormones[4].

CASE REPORT

A 45-year-old man presented in April 2011 with a one week history of palpitations, shortness of breath, bilateral leg swelling and watery diarrhoea. On physical examination, he was febrile at 38 °C, BP of 116/64 mm Hg, pulse rate of 130 - 140 beats/minute irregularly irregular with a raised JVP, bibasal crepitations and bilateral pitting oedema. He had no thyroid eye signs, proximal myopathy or brisk reflexes. However, he had a diffuse goitre with vascular bruit. Blood investigations demonstrated a haemoglobin of 12.3 g/dL (14.0 - 17.0), white cell count 7.7 x 10⁹/L (4.0 - 10.0), neutrophils 4.6 x 10⁹/L (2.5 - 7.5) and platelet...
count of 153 x 10⁹/L (150 – 400). Serum electrolytes were as follows: sodium 137 mmol/L (135 - 150), potassium 3.6 mmol/L (3.5 - 5.0), urea 5.6 mmol/L (2.4 - 6.4), creatinine 75 µmol/L (62 - 106) and albumin 31 g/L (35 - 50). Serum thyroid stimulating hormone [TSH] was <0.01 uIU/ml (0.32 - 5.0) and free T4 was 77 pmol (9.1 - 23.8). A chest X ray revealed cardiomegaly with pulmonary congestion and ECG confirmed atrial fibrillation. Blood cultures were negative.

He was diagnosed with Graves’ disease in 2003 and investigations revealed anti thyroglobulin >3000 IU/ml (0 - 40), anti-thyroid peroxidase 127 IU/ml (0 - 35), positive anti TSH receptor antibodies, TSH <0.01 uIU/ml (0.32 - 5.0) and free T4 15.78 pmol (9.1 - 23.8). He was treated with carbimazole 15 mg once daily and planned for radioactive iodine but defaulted further follow up until the present admission. His other past medical history are:- aspirin induced gastric ulcer, hypertension and a cerebrovascular accident (infarct).

On the same day of his admission, he developed persistent hypoglycaemia (1.9 mmol/L) and hypotension requiring inotropic support with dopamine. Serum insulin levels and C peptide were normal. He received furosemide, hydrocortisone, digixon and broad spectrum antibiotics. He was also treated with Lugol’s iodine 10 drops three times a day and carbimazole 15 mg three times a day. Despite dopamine, he remained hypotensive requiring three inotropic agents. An echocardiogram demonstrated an ejection fraction of 60% with a dilated anterior mitral valve prolapse.

He subsequently developed severe ischaemic hepatitis and carbimazole had to be stopped. Alanine aminotransferase rose to 1654 IU/L, hepatitis serology and autoantibody screen and liver ultrasound scan were all normal excluding other causes of hepatitis. On day 3, he remained in thyroid storm, therefore CPFA was performed for six hours. Serial serum TSH, free T4 and free T3 are shown on Table 1. Twenty four hours after CPFA, we noted a clinical improvement in terms of heart rate and the ability to taper and eventually wean off inotropic support. Three days after CPFA, his liver function improved and the patient was restarted on carbimazole 20 mg once daily. Prior to his discharge, the TSH was < 0.01 uIU/ml (0.32 - 5.0) and free T4 was 10.12 pmol (9.1 - 23.8). In view of atrial fibrillation, he was anticoagulated with warfarin. His discharge was delayed as he acquired a healthcare associated pneumonia.

### Table 1. Serial thyroid hormone levels during the course of admission

<table>
<thead>
<tr>
<th>Thyroid hormone</th>
<th>At admission</th>
<th>Pre CPFA</th>
<th>Post CPFA (15 minutes after)</th>
<th>24 hours later</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSH (uIU/ml)</td>
<td>&lt;0.01</td>
<td>0.11</td>
<td>0.01</td>
<td>0.012</td>
</tr>
<tr>
<td>Free T3 (pmol)</td>
<td>2.58 - 5.44</td>
<td>11.06</td>
<td>8.75</td>
<td></td>
</tr>
<tr>
<td>Free T4 (pmol)</td>
<td>9.1 - 23.8</td>
<td>77</td>
<td>54.76</td>
<td>44.72</td>
</tr>
</tbody>
</table>

CPFA: Coupled Plasma Filtration Adsorption; TSH: Thyroid Stimulating Hormone

**Coupled plasma filtration adsorption (CPFA)**

CPFA is an extracorporeal blood purification therapy whereby separated plasma is circulated through a sorbent cartridge and the blood is then returned to the extracorporeal circuit as shown on Fig 1. The sorbent resin non-specifically adsorbs inflammatory mediators, cytokines and some proteins. CPFA was performed using the HF440 device (Inomed, Geneva, Switzerland) with a blood flow rate of 180 mls/minute and plasma flow rate of 30 - 40 mls/min, heparin free. CPFA duration is until all the resin is adsorbed on the sorbent and usually lasts.

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**Fig 1:** Coupled plasma filtration adsorption attached as a separate file
between 6 - 8 hours. We did not replace the sorbent after it was fully adsorbed. As no anticoagulant was used, flushing using 100 mls normal saline was done at 30 minute intervals. Vascular access was obtained via a femoral dual lumen 12F vascular catheter (Medcomp, Harleysville, USA) under ultrasound guidance using Seldinger technique. Written consent for the vascular catheter and CPFA was obtained.

DISCUSSION

Thyroid storm carries a significant morbidity and mortality and the diagnosis of thyroid storm is based on the criteria by Burch et al[1]. The management of thyroid storm should firstly focus on improving the deteriorated circulation, alongside measures taken to reduce thyroid hormone synthesis, thyroid hormone release (iodine) and inhibition of the peripheral effects of excess thyroid hormone (propylthiouracil, propanolol and corticosteroids)[7]. The definitive treatment for hyperthyroidism includes anti thyroid drugs, thyroidectomy or radioactive iodine. In cases of refractory thyroid storm or contraindication to thiamozoles, therapeutic plasmapheresis has been used with clear benefit especially in Graves’ disease[8-9]. Plasmapheresis results in the removal of thyroid hormones, auto-antibodies and catecholamines. The catecholamines released by the sympathetic system and the cytokines mediate the inflammation and storm. As thyroid hormones have a high affinity to serum proteins, plasmapheresis leads to a decline in thyroid hormones and antibodies[10]. However, this decline is transient and the thyroid hormone levels rebound with patients needing two to three plasma exchanges. Plasmapheresis carries a risk of complications, from mild nausea and vomiting to hypotension, transfusion reactions and the risk of blood borne infections[11].

CPFA has been shown to adsorb inflammatory mediators, cytokines and some proteins and therefore, we considered it as an option for our thyroid storm patient. CPFA allows regeneration of plasma, hence avoiding the complications of plasma volume replacement fluids which may occur in plasma exchange. Plasma exchange is also limited by the risk of exposure to blood products and cost of large volumes of recombinant human albumin required. As blood cells do not come into direct contact with the adsorber, there are no problems with platelet aggregation and thrombocytopenia with CPFA.

Kukoho et al[12] demonstrated that plasmapheresis results in clinical improvement (especially cardiovascular stability) as early as a few hours after the first session. We have previously demonstrated that CPFA offers early haemodynamic stability in sepsis by non selective adsorption of inflammatory mediators[13]. Similarly, we have shown some haemodynamic improvement using CPFA in thyroid storm as evidenced by our patient with a reduction in inotropic requirements. We noticed by using CPFA combined with conventional treatment, symptoms of thyroid crisis were resolved almost completely within 48 hours. This was mainly by the removal of cytokines and catecholamines that mediate the storm. Secondly, there was some reduction in the thyroid hormones levels after CPFA. However, the reduction of thyroid hormones by CPFA was minimal and in keeping with other studies whereby even with plasmapheresis there was minimal reduction in serum thyroid hormone concentration[12,14].

We hypothesize due to the longer duration and adsorber in CPFA, there was some removal of thyroid hormones in addition to the catecholamines, resulting in the clinical improvement of the patient (reduction of heart rate and inotrope dosage), which enabled bridging while waiting for the thiamazole to exert its effects. Monitoring thyroid hormones is interesting, but clinical improvements are often dissociated from the hormonal levels and must be judged on the patients’ clinical condition[15].

CPFA was tolerated well and appeared safe with no treatment related adverse events. The main drawback was the cost of new sorbents. Due to the prohibitive costs of CPFA disposables, we could only afford to provide a single cycle of CPFA.

CONCLUSION

CPFA may have a role in the treatment of refractory thyroid storm. In addition to removing some of the circulating free T4, CPFA also adsorbs inflammatory mediators and cytokines that are released during a thyroid storm. We suggest CPFA to be considered in severe and life threatening thyroid storm that doesn’t respond to medical therapy. We also recommend a few cycles of CPFA to be performed until clinical improvement is noted.

ACKNOWLEDGMENT

We would like to thank Emeritus Prof NCT Kong and Prof Nor Azmi Kamaruddin for their guidance and the Dean of Faculty of Medicine, Universiti Kebangsaan Malaysia for allowing us to publish this data.

Disclosures: Nil

REFERENCES


Serotype Distribution and Penicillin-Non-Susceptibility of Streptococcus Pneumoniae Causing Invasive Diseases in Kuwait: A 10-Year Study of Impact of Pneumococcal Conjugate Vaccines

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Expert Rev Vaccines 2016; 24:1-9

Objectives: The impact of PCV7 and PCV13 on pneumococcal infections in Kuwait is not known. Therefore we evaluated the impact on pneumococcal serotype distribution and penicillin-non-susceptibility in invasive infections in Kuwait.

Methods: Children < 2 y were given PCV7 from Aug 2006 to Jul 2010 (period I), and PCV13 from Aug 2010 to Jul 2013 (period II) with a pre-vaccination period from Aug 2003 to Jul 2006. Serotype and penicillin-non-susceptibility of blood and cerebrospinal fluid isolates from all ages were determined.

Results: In <2 y old children, even with a small number of infections, a drop in PCV7 serotypes was evident after vaccination. For all age groups combined, in the pre-vaccination period, PCV7, PCV13, non-PCV7 serotypes and penicillin-non-susceptibility constituted 53.2%, 72.6%, 19.4% and 6.5% of the isolates respectively. PCV7, PCV13 non-PCV7 serotypes and penicillin-non-susceptibility changed to 32.7%, 28.2% and 7.3% (period I) and 6.6%, 22.2% and 8.9% (period II).

Conclusions: Vaccines reduced invasive infections due to PCV7 serotypes.

Comparison of Peritonitis Rates and Patient Survival in Automated and Continuous Ambulatory Peritoneal Dialysis: A 10-Year Single Center Experience

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Ren Fail 2016; 19:1-6

Peritonitis is a common complication in patients undergoing continuous ambulatory peritoneal dialysis (CAPD) and automated peritoneal dialysis (APD). In this retrospective study, peritonitis rates and patient survival of 180 patients on CAPD and 128 patients on APD were compared in the period from January 2005 to December 2014 at Al-Nafisi Center in Kuwait. All patients had prophylactic topical mupirocin at catheter exit site. Patients on CAPD had twin bag system with Y transfer set. The peritonitis rates were 1 in 29 months in CAPD and 1 in 38 months in APD (p < 0.05). Percentage of peritonitis free patients over 10-year period in CAPD and APD were 49 and 60%, respectively (p < 0.05). Time to develop peritonitis was 10.25 ± 3.1 months in CAPD compared to 16.1 ± 4 months in APD (p < 0.001). Relapse and recurrence rates were similar in both groups. Median patient survival in CAPD and APD groups with peritonitis was 13.1 ± 1 and 14 ± 1.4 months respectively (p = 0.3) whereas in peritonitis free patients it was 15 ± 1.4 months in CAPD and 23 ± 3.1 months in APD (p = 0.025). APD had lower incidence rate of peritonitis than CAPD. Patient survival was better in APD than CAPD in peritonitis free patients but was similar in patients who had peritonitis.
Low Serum Vitamin-D Status is Associated with High Prevalence and Early Onset of Type-1 Diabetes Mellitus in Kuwaiti Children

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Background: Type 1 diabetes mellitus (T1DM) is highly prevalent in Kuwait with incidence of around 40.1/100,000 individuals. Evidence indicate that vitamin D plays an important role in modulating the immune system and could thus impact the onset and high prevalence of T1DM. We report serum vitamin D levels in Kuwaiti children with T1DM and non-diabetic controls to explore its relationship with prevalence and onset of the disease.

Methods: This study included 216 Kuwaiti Arab children with T1DM. The diagnosis of T1DM was based on the ISPAD criteria. The control subjects (204 Kuwaitis) were age and gender matched, healthy, non-diabetic, and had no close relative with T1DM. Vitamin D levels were determined in serum using an enzyme immunoassay (EIA) method.

Results: The age of onset of T1DM was <4y in 20 % of the T1DM cases, between 4 and 6y in 28 % cases and >6y in 52 % patients. In T1DM patient group, 84 % subjects were found to be deficient in serum vitamin D level compared to 77 % of the controls (p = 0.046). Collectively, the deficient and insufficient vitamin D status was detected in 99 % of the T1DM patients compared to 92 % of the controls (p = 0.027). The mean serum vitamin D levels were found to be significantly different in early onset cases (age <4y) compared to the late onset sub-group (p = 0.001). A significant correlation was found between some elements of socioeconomic status, SES (i.e. parent’s profession and family’s income) and lower vitamin D levels in Kuwaiti T1DM children. There was no significant difference between mean serum vitamin D levels during winter and summer months in the T1DM patients.

Conclusions: The proportion of cases with a deficient vitamin D status was significantly high in Kuwaiti T1DM children compared to the controls. The serum vitamin D levels were found to be significantly different in early onset and late onset T1DM patients. Therefore, serum vitamin D status can be considered an important contributor in high prevalence of T1DM in Kuwaiti children.

Referral Pattern of Children with Short Stature to a Pediatric Endocrine Clinic in Kuwait

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Background: The aim of the study was to describe the referral pattern, baseline characteristics, and etiological profile of children referred with short stature in Kuwait.

Methods: This is a cross-sectional retrospective review of children referred to the Endocrine Clinic with short stature. Short stature was defined as height or length below the 3rd centile or <-2 standard deviation score (SDS).
Results: A total of 221 children were referred with no gender difference (p=0.346). Almost one fifth of these children had normal stature. Median (interquartile) age was 7.7 (4.7, 10.3) years and mean height SDS was -2.67 (0.68). The most common diagnoses were normal variants of growth, growth hormone deficiency (GHD).

Conclusions: Our study highlights the need to improve the referral process in order to avoid unnecessary investigations and alleviate parental anxiety. There is no gender bias in short stature referrals in Kuwait. There is a need of further investigation of short stature in the region.

Phyllodes Tumors of the Breast: Analysis of 35 Cases from a Single Institution

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Background: Phyllodes tumors are rare fibroepithelial breast tumors with diverse biological behavior. Our study aim is to review the clinico-pathological features, prognostic factors and treatment outcome for patients presenting with phyllodes tumors of the breast to the Kuwait Cancer Control Center (KCCC).

Patients and Methods: We retrospectively reviewed the clinical and pathological data of 35 women of histologically proved phyllodes tumors of the breast retrieved between January 1994 and December 2012. Results: The median age was 40 years (21-63 years). The median pathological tumor size was 6.8 cm (3-25 cm). Histologically, one patient (3%) presented with benign, 13 (37%) with borderline and 21 (60%) with malignant phyllodes. Twenty-eight patients (80%) were premenopausal. Twenty (57%) were ultimately treated with mastectomy (3 borderline, and 17 malignant) and 15 (43%) with conservative surgery (1 benign, 10 borderline and 4 malignant). Axillary staging was carried out in 9 patients (1 borderline and 8 malignant), none of them had nodal metastasis. Four patients with malignant phyllodes received postoperative radiotherapy. After a median follow-up period of 52 months (range 5-211 months), 5 developed local recurrence (1 benign, 2 borderline and 2 malignant). One patient with malignant phyllodes developed distant lung metastasis. The overall 5-year relapse free survival (RFS) was 74% (68% for borderline and 84% for malignant phyllodes). According to the treatment modality, the 5-year RFS was 69% for conservative surgery compared to 87% for mastectomy. It was 100% for irradiated patients versus 71% for non irradiated patients.

Conclusion: Phyllodes tumors are rare tumors that occur in relatively young women, when compared with the classical adenocarcinoma of the breast. They have a tendency to reach large sizes with absence of nodal metastasis. Although surgery is the mainstay of management, postoperative radiotherapy also appears to decrease the local recurrence rates in certain presentations.
Forthcoming Conferences and Meetings

Compiled and edited by Babichan K Chandy

Kuwait Medical Journal 2016; 48 (3) : 265 - 276

19th Liver Imaging workshop
Sep 1 - 2, 2016
Malta / St. Julian’s
Contact: Central European Society of Gastrointestinal & Abdominal Radiology office
Phone: 011-43-1-535-8927
Fax: 011-43-1-535-8927 Ext. 15
Email: office@esgar.org

35th Annual European Bone & Joint Infection Society meeting
Sep 1 - 3, 2016
United Kingdom / Oxford
Contact: Hartley Taylor Medical Communications
Phone: 011-44-15-6562-1967
Email: office@hartleytaylor.co.uk

Advanced Cardiac MR Imaging
Sep 1 - 3, 2016
Croatia / Zagreb
Contact: Ms. Elena Skocek, Coordinator of Educational Activities & Congress Management, European Society For Magnetic Resonance In Medicine & Biology
Phone: 011-43-1-535-1306
Fax: 011-43-1-535-7041
Email: eskocek@esmrmb.org

Hot topic conference: Life course influences & mechanisms: Obesity, Physical Activity & Cancer
Sep 1 - 2, 2016
United Kingdom / London
Contact: World Obesity Federation
Email: hottopics@worldobesity.org

Central Nervous System MRI II
Sep 2 - 6, 2016
United Kingdom / Sheffield
Contact: Walter Rijsselaere, Erasmus MRI Course
Email: walter.rijsselaere@uzbrussel.be

16th European congress of Neurosurgery
Sep 4 - 8, 2016
Greece / Athens
Contact: Amy Pinchbeck Smith, European Association of Neurosurgical Societies
Email: amy.pinchbecksmith@eans.org

2016 Status quo of Brain Infections
Sep 4 - 7, 2016
Turkey / Izmir
Contact: Thomas Greif, Education Manager, European Society of Clinical Microbiology & Infectious Diseases
Phone: 011-41-61-508-0153
Fax: 011-41-61-508-0151
Email: info@escmid.org

6th International course in Nutritional Epidemiology
Sep 5 - 16, 2016
United Kingdom / London
Contact: Centre For Continuing Professional Development, Imperial College London
Phone: 011-44-20-7594-6881; Fax: 011-44-20-7594-6883
Email: cpd@imperial.ac.uk

46th Annual European Society for Dermatological Research (ESDR) meeting
Sep 6 - 10, 2016
Germany / Munich
Contact: ESDR
Phone: 011-41-22-321-4890
Email: office@esdr.org

5th International symposium on Hepatitis Care in substance users
Sep 7 - 9, 2016
Norway / Oslo
Contact: Conference Secretariat, ASHM Conference & events division
Phone: 011-61-2-8204-0779; Fax: 011-61-2-8204-0779
Email: info@inhsu2016.com

16th Euretina congress
Sep 8 - 11, 2016
Denmark / Copenhagen
Contact: Euretina
Phone: 011-353-1-210-0092; Fax: 011-353-1-209-1112
Email: euretina@euretina.org
2016 European Society of **Gynaecological Oncology** (ESGO) state of the art gynecological oncology conference
Sep 8 - 10, 2016
**Turkey** / Antalya
Contact: Lucie Lamlova, Esgo
Email: lucie.lamlova@esgomail.org

2nd World congress on controversies in **Breast Cancer**
Sep 8 - 11, 2016
**Spain** / Barcelona
Contact: Ilana Rabinoff-Sofer, Congressmed
Phone: 011-972-73-706-6954
Email: cobrca@congressmed.com

1st Asia Pacific **Diabetes, Hypertension, Metabolic Syndrome & Pregnancy** Symposium: maternal medicine meets fetal medicine
Sep 8 - 10, 2016
**Sri Lanka** / Colombo
Contact: ComtecMed, ComtedMed
Email: dipap-saidip@comtecmed.com

Galen advanced course on **Paediatric imaging**
Sep 8 - 9, 2016
**France** / Paris
Contact: European School of Radiology
Phone: 011-43-1-533-4064
Fax: 011-43-1-533-4064 Ext. 447

13th **Diabetic Foot** Study Group (DFSG) meeting
Sep 9 - 11, 2016
**Germany** / Stuttgart
Contact: Dfsf Meeting Secretariat, Cap Partner
Phone: 011-45-7020-0305
Email: dfsf@dfsfg.org

5th International congress on **Lipid Metabolism & Atherosclerosis**
Sep 9 - 10, 2016
**South Korea** / Seoul
Contact: Jung Mi OH, Team Leader, HENS MICE Solution
Phone: 011-82-2-2616-0927; Fax: 011-82-2-704-0928
Email: jmoh@hensmice.com

**Parkinson's Disease**: beyond tremor
Sep 9, 2016
**United States** / New York
Contact: Maria Mercado, Registrar, New York University School of Medicine
Phone: 212-263-5295; Fax: 212-263-5293
Email: maria.mercado@nyumc.org

Intensive care **Clinical Microbiology & Infectious Disease** course
Sep 10 - 11, 2016
**India** / New Delhi
Contact: Dr Yash Javeri, Course director, Indian Society of Critical Care Medicine Delhi NCR
Phone: 011-91-981-871-6943
Email: isccmdelhichapter@gmail.com

12th European congress on **Epileptology**
Sep 11 - 15, 2016
**Czech Republic** / Prague
Contact: Congress Secretariat
Phone: 011-353-1-205-6720

18th International workshop on co-morbidities and adverse **Drug Reactions in HIV**
Sep 12 - 13, 2016
**United States** / New York
Contact: Organizing Secretariat, International Medical Press
Phone: 011-44-20-7398-0700
Fax: 011-44-20-7398-0701
Email: comorbidities@nucleuscentral.com

23rd European Association for **Cranio Maxillofacial Surgery** congress
Sep 13 - 16, 2016
**United Kingdom** / London
Contact: Yoav Shlezinger, Kenes Group
Phone: 011-41-22-906-9178
Fax: 011-41-22-732-2607
Email: eacmfs2016@kenes.com

21st International congress on **Palliative Care**
Sep 13 - 16, 2016
**Canada** / Quebec / Montreal
Contact: Congress Secretariat, O'Donoughue & Associates event management
Phone: 450-292-3456 ext. 227; Fax: 450-292-3453
Email: secretariat@pal2014.com

13th European Society of **Contact Dermatitis** congress
Sep 14 - 17, 2016
**United Kingdom** / Manchester
Contact: Conference & Event Services, British Association of Dermatologists
Phone: 011-44-20-7391-6343; Fax: 011-44-20-7388-0487
Email: conference@bad.org.uk

19th Annual European Society for **Clinical Virology** meeting
Sep 14 - 17, 2016
**Portugal** / Lisbon
Contact: Dr. Svein Arne Nordbo, University Hospital of Trondheim
Phone: 011-47-72-573-310
Email: svein.a.nordbo@ntnu.no
43rd Annual European Society for **Artificial Organs** (ESAO) Congress  
Sep 14 - 17, 2016  
*Poland / Warsaw*  
Contact: Anita Aichinger, Center for Biomedical Technology Danube University-Krems, Esao Office  
Phone: 011-43-2732-893-2633  
Fax: 011-43-2732-893-4600  
Email: anita.aichinger@donau-uni.ac.at

Proteomics in **Cell Biology & Disease** Mechanisms  
Sep 14 - 17, 2016  
*Germany / Heidelberg*  
Contact: Course and Conference Office, European Molecular Biology Laboratory, EMBL Heidelberg  
Phone: 011-49-622-1387-8797  
Email: events@embl.de

2016 Mucosal **Vaccines, Adjuvants & Delivery**  
Sep 14 - 16, 2016  
*Switzerland / Lausanne*  
Contact: Caroline Sumner, Meetings Management  
Phone: 011-44-14-8342-7770Fax: 011-44-14-8342-8516  
Email: csumner@meetingsmgmt.u-net.com

**2016 Hypertension**  
Sep 15 - 16, 2016  
*Thailand / Phuket*  
Contact: Dr Charles, IM Clinic  
Email: info@nbscience.com

**Targeted treatments for Paediatric Cancers**  
Sep 15, 2016  
*United Kingdom / London*  
Contact: Education and Conference Centre, The Royal Marsden NHS Foundation Trust  
Phone: 011-44-20-7808-2921  
Fax: 011-44-20-7808-2334  
Email: conferencecentre@rmh.nhs.uk

**2016 International Society of Gynecological Endoscopy** / Indonesian Gynecological Endoscopy Society Asian Conference  
Sep 15 - 17, 2016  
*Indonesia / Bali*  
Contact: Traveland Convex Indonesia  
Phone: 011-62-22-426-4028; Fax: 011-62-22-426-4029  
Email: mice@travelandconvex.com

**30th International union against Sexually Transmitted Infections-Europe conference**  
Sep 15 - 17, 2016  
*Hungary / Budapest*  
Contact: Zsombor Papp, General Manager, Convention Budapest Ltd.  
Phone: 011-36-1-299-0184; Fax: 011-36-1-299-0187  
Email: zspapp@convention.hu

17th International conference on **Systems Biology**  
Sep 16 - 20, 2016  
*Spain / Barcelona*  
Contact: Alejandro Hernandez, Kenes Group  
Phone: 011-34-91-361-2600  
Email: mediatks@kenes.com

**4th Aesthetic and Anti-Aging Medicine** World congress  
Sep 16 - 17, 2016  
*Russia / Moscow*  
Contact: Euromedicom  
Phone: 011-33-1-5683-7800  
Fax: 011-33-1-5683-7805

9th Annual perspectives in **Rheumatic Diseases** conference  
Sep 16 - 17, 2016  
*United States / Nevada / Las Vegas*  
Contact: Global Academy for Medical Education  
Fax: 866-401-8609  
Email: n.rillo@globalacademycme.com

**19th International congress for Tropical Medicine & Malaria**  
Sep 18 - 22, 2016  
*Australia / Brisbane*  
Contact: Arinex Pty Ltd  
Phone: 011-61-2-9265-0700  
Fax: 011-61-2-9267-5443  
Email: tropicalmedicine2016@arinex.com.au

**Advanced ECG Interpretation Boot Camp in Budapest,**  
*Hungary*  
Sep 19 - 22, 2016  
Contact: Jerry W. Jones, Md Facep Faaem, Ceo And Principal Instructor, Medicus Of Houston  
Phone: 713-931-5423; Fax: 888-308-7807  
Email: jwjmd@medicusofhouston.com

2016 International Society for Diseases of the **Esophagus** World Congress  
Sep 19 - 21, 2016  
*Singapore / Singapore*  
Contact: Congress Secretariat, International Conference Services, Ltd.  
Phone: 604-681-2153; Fax: 604-681-1049  
Email: isde2016@icsevents.com

**17th International Pediatric Nephrology** Association Congress  
Sep 20 - 24, 2016  
*Brazil / Iguacu*  
Contact: Europa Organisation  
Phone: 011-33-5-607-0809; Fax: 011-33-5-607-0810  
Email: ipna-registration@europa-organisation.com
4th World Parkinson Congress  
Sep 20 - 23, 2016  
United States / Oregon / Portland  
Contact: World Parkinson Coalition  
Phone: 800-457-6676  
Email: info@worldpdcongress.org

Cytoreductive Surgery for Ovarian Cancer & Peritoneal Surface Malignancies  
Sep 21 - 22, 2016  
United Kingdom / Newcastle  
Contact: Lorraine Waugh, Newcastle Surgical Training Centre  
Phone: 011-44-19-1223-1264  
Fax: 011-44-19-1223-7248  
Email: lorraine.waugh@nuth.nhs.uk

Minimally invasive Spine Surgery & Complex procedures workshop  
Sep 21 - 22nd, 2016  
Indonesia / Surabaya  
Contact: North American Spine Society  
Phone: 866-960-6277 or 630-230-3600  
Email: registration@spine.org

6th International conference on Clinical Neonatology  
Sep 22 - 24, 2016  
Italy / Torino  
Contact: Organizing Secretariat, MCA Scientific Events  
Phone: 011-39-2-3493-4404  
Email: massaro@mcascientificevents.eu

2016 Canadian Fertility & Andrology Society (CFAS) Annual Meeting  
Sep 22- 24, 2016  
Canada / Ontario / Toronto  
Contact: Cfas National Office  
Phone: 514-524-9009  
Fax: 514-524-2163  
Email: info@cfas.ca

6th International Conference on Clinical Neonatology  
Sep 22- 24, 2016  
Italy / Torino  
Contact: Organizing Secretariat, MCA Scientific Events  
Phone: 011-39-2-3493-4404  
Email: massaro@mcascientificevents.eu

13th International Cartilage Repair Society (ICRS) World Congress  
Sep 24 - 27, 2016  
Italy / Naples  
Contact: Icrs  
Phone: 011-41-44-503-7370  
Fax: 011-41-44-503-7372  
Email: office@cartilage.org

22nd Biennial Meeting of the International Society for Eye Research (ISER)  
Sep 25 - 29, 2016  
Japan / Tokyo  
Contact: Meeting Secretariat, ISER  
Phone: 011-49-3024-6030  
Email: iser2016@kit-group.org

Infectious Diseases in pregnant women, fetuses and newborns  
Sep 25 - 29, 2016  
Italy / Bertinoro  
Contact: Thomas Greif, Education Manager, European Society of Clinical Microbiology & Infectious Diseases  
Phone: 011-41-61-508-0153; Fax: 011-41-61-508-0151  
Email: info@escmid.org

Radiology in Portugal  
Sep 25 - Oct 1, 2016  
Portugal / Porto  
Contact: Radiology Conference Team, Radiology International Inc.  
Phone: 860-225-1700  
Email: info@radiologyintl.com

26th World congress on Ultrasound in Obstetrics & Gynecology  
Sep 25 - 28, 2016  
Italy / Rome  
Contact: Congress Secretariat, International Society of Ultrasound in Obstetrics & Gynecology  
Phone: 011-44-20-7471-9955; Fax: 011-44-20-7471-9959  
Email: congress@isuog.org

18th Asia Pacific League of Associations for Rheumatology Congress  
Sep 26 - 29, 2016  
China / Shanghai  
Contact: Suzanne Khoo, Kenes MP Asia  
Phone: 011-65-6-292-0723  
Email: skhoo@kenes.com

16th World Congress on Pain  
Sep 26 - Oct 1, 2016  
Japan / Yokohama  
Contact: Congress Secretariat, MCI Tokyo  
Phone: 011-81-3-3508-9031; Fax: 011-81-3-3508-2017  
Email: iasp2016@mci-group.com

Body Diffusion-Weighted MRI: From theory to practice  
Sep 26 - 28, 2016  
Austria / Vienna  
Contact: Ms. Elena Skocek, Coordinator of Educational Activities & Congress Management, European Society For Magnetic Resonance In Medicine & Biology  
Phone: 011-43-1-535-1306; Fax: 011-43-1-535-7041  
Email: eskoczek@esmrmb.org
Musculoskeletal MRI (Comprehensive Course)
Sep 26 - 30, 2016
Greece / Heraklion
Contact: Mika Travel, Secretariat
Phone: 011-30-28-1022-3356
Email: congress@mikatravel.eu

11th Annual European Society of Coloproctology (ESCP) meeting
Sep 28 - 30, 2016
Turkey / Istanbul
Contact: Escp Secretariat, Integrity International Events Ltd.
Phone: 011-44-13-1624-6040; Fax: 011-44-13-1624-6045

15th World Congress on Menopause: Heart Health Matters
Sep 28 - Oct 1, 2016
Czech Republic / Prague
Contact: Ms Lee Tomkins, Executive Director, International Menopause Society
Phone: 011-44-120-971-1054
Fax: 011-44-120-961-0530
Email: leetomkinsims@btinternet.com

10th Australasian Viral Hepatitis Conference
Sep 29 - Oct 1, 2016
Australia / Gold Coast
Contact: Conference Secretariat, Ashm Conference And Events Division
Phone: 011-61-2-8204-0070
Fax: 011-61-2-9212-4670
Email: conference.mailbox@ashm.org.au

15th International Workshop on Multiple Endocrine Neoplasia & Other Rare Endocrine Tumors
Sep 29 - Oct 1, 2016
Netherlands / Utrecht
Contact: Congress by Design
Phone: 011-31-8-8089-8101
Email: worldmen2016@congressbydesign.com

8th International Conference on Clinical Gastroenterology & Hepatology
Sep 29 - Oct 1, 2016
Canada / Ontario / Toronto
Contact: Sandra J, Omics Grp
Phone: 650-268-9744
Email: clinicalgastroenterology@insightconferences.com

30th European Association for Cardio-Thoracic Surgery (EACTS) Annual Meeting
Oct 1 - 5, 2016
Spain / Barcelona
Contact: Eacts House
Phone: 011-44-17-5383-2166
Fax: 011-44-17-5362-0407

16th International Nutrition & Diagnostics conference
Oct 3 - 6, 2016
Czech Republic / Prague
Contact: Citlalli Garnica Ortiz, RADANAL Ltd.
Phone: 011-420-469-779-899
Fax: 011-420-467-027-020
Email: info@incdc.cz

National Head & Neck Fellows cadaveric course
Oct 3 - 4, 2016
United Kingdom / Newcastle upon Tyne
Contact: Lorraine Waugh, Newcastle Surgical Training Centre
Phone: 011-44-19-1223-1264; Fax: 011-44-19-1223-7248
Email: lorraine.waugh@nuth.nhs.uk

5th World Congress of Pediatric Gastroenterology, Hepatology & Nutrition
Oct 5 - 8, 2016
Canada / Quebec / Montreal
Contact: Meeting Organiser, CG & I
Phone: 514-846-9191; Fax: 514-846-9393

Colonoscopy & Endoscopy course
Oct 5 - 7, 2016
United Kingdom / Newcastle Upon Tyne
Contact: Lorraine Waugh, Newcastle Surgical Training Centre
Phone: 011-44-19-1223-1264
Fax: 011-44-19-1223-7248
Email: lorraine.waugh@nuth.nhs.uk

3rd World congress on Hepatitis & Liver Diseases
Oct 10 - 12, 2016
United Arab Emirates / Dubai
Contact: Joseph Raven, Mr, Omics International
Email: hepatitis@omicsgroup.com

29th International course on Therapeutic Endoscopy
Oct 12 - 14, 2016
Canada /Ontario / Toronto
Contact: Therapeutic Endoscopy Group, St. Michael’s Hospital
Phone: 416-864-5329; Fax: 416-864-5803
Email: therendo@interlog.com

9th Asia Pacific Heart Rhythm Society Scientific Session (APHRS 2016)
South Korea / Seoul
Contact: APHRS 2016 Secretariat
Email: aphrs2016@intercom.co.kr

2016 International Conference on Autoimmunity
United Kingdom / Manchester
Contact: Christi Brown, Program Coordinater, OMICS International
Phone: 800-216-6499; Fax: 650-618-1417
Email: autoimmunity@conferenceseries.com
8th International Society of Vascular Behavioural & Cognitive Disorders International Meeting:
VASCOG 2016
Netherlands / Amsterdam
Contact: VasCog 2016
Phone: 011-31-20-444-0816;
Email: info@vascog2016.nl

Deep Brain Stimulation for Movement Disorders
Oct 13 - 14, 2016
Germany / Wurzburg
Contact: International Secretariat, International Parkinson & Movement Disorder Society
Phone: 414-276-2145; Fax: 414-276-3349
Email: info@movementdisorders.org

Myoclonus & other jerky movements
Oct 13 - 14, 2016
Netherlands / Groningen
Contact: International Secretariat, International Parkinson & Movement Disorder Society
Phone: 414-276-2145; Fax: 414-276-3349
Email: info@movementdisorders.org

2016 Acute Cardiovascular Care
Oct 15 - 17, 2016
Portugal / Lisbon
Contact: Acute Cardiovascular Care Association
Phone: 011-33-4-9294-7600; Fax: 011-33-4-9294-7601
Email: info@movementdisorders.org

13th Global Summit on Cancer Therapy
Oct 17 - 19, 2016
United Arab Emirates / Dubai
Contact: Celina Crystal, OMICS International
Phone: 011-650-268-9744; Fax: 011-650-618-1414
Email: middleeastoncologists@conferenceseries.com

18th International Psycho Oncology Society Congress
Oct 17 – 21, 2016
Ireland / Dublin
Contact: Valerie Abbott, Conference Secretariat
Phone: 011-353-1-648-6278
Email: Iposdublin2016@abbey.ie

48th Congress of the International Society of Paediatric Oncology
Oct 19 - 22, 2016
Ireland / Dublin
Contact: Secretariat, Kenes International
Phone: 011-41-22-906-9178
Email: siop@kenes.com

3rd Congress on controversies in thrombosis & hemostasis / 8th Russian conference on clinical hemostasiology & hemorheology
Oct 20 - 22, 2016
Russia / Moscow
Contact: Secretariat, Secretariat, CongressMed
Phone: 011-41-22-339-9985
Email: cith@congressmed.com

4th World Congress on Controversies, Debates & Consensus in Bone, Muscle & Joint Diseases
Oct 20 - 22, 2016
Spain / Barcelona
Contact: Secretariat, CongressMed
Phone: 011-41-22-339-9985
Email: bmjd@congressmed.com

6th Clinical Microbiology Conference
Oct 20 – 22, 2016P
Italy / Rome
Contact: Stephen Bruce, Mr., Omics International
Phone: 650-268-9744
Email: clinicalmicrobiology@conferenceseries.net

Cadaveric Laparoscopic Surgery workshop in Gynecological Oncology
Oct 20 – 21, 2016
United Kingdom / Newcastle Upon Tyne
Contact: Mr Ali Kucukmetin, Newcastle Surgical Training Centre
Email: ali.metin@ghnt.nhs.uk

3rd World Congress of Cutaneous Lymphomas
Oct 26 - 28, 2016
United States / New York
Contact: Columbia CME, Columbia University College of Physicians & Surgeons
Phone: 212-305-3334
Email: cme@columbia.edu

International Current Concepts for the SI Joint in Spine Conditions & Surgical Techniques
Oct 30, 2016
Singapore / Singapore
Contact: North American Spine Society
Phone: 866-960-6277 or 630-230-3600
Email: registration@spine.org

Supervisor skills workshop for clinical radiology
Nov 2, 2016
United Kingdom / Newcastle Upon Tyne
Contact: Professional Learning And Development Office, Royal College Of Radiologists
Phone: 01144-20-7406-5942
Email: conf@rcr.ac.uk
2016 American College of Phlebology (ACP) Annual Congress
Nov 3 - 4, 2016
United Arab Emirates / Abu Dhabi
Contact: Mci Middle East, Conference Secretariat, Mci Middle East
Phone: 011-971-4-311-6300
Fax: 011-971-4-311-6300
Email: ascpme@mci-group.com

3rd Annual Stem Cell Congress
Nov 3 - 4, 2016
United Kingdom / London
Contact: Guillaume Alonso, Marketing Executive, Oxford Global
Phone: 011-44-18-6524-8455
Email: g.alonso@oxfordglobal.co.uk

Autistic Spectrum Disorders Update Course
Nov 3, 2016
United Kingdom / London
Contact: Emma Jacobson, Royal College of Psychiatrists
Phone: 011-44-20-3701-2524
Fax: 011-44-20-3701-2761
Email: emma.jacobson@rcpsych.ac.uk

15th International Kidney Cancer Symposium
Nov 4-5, 2016
United States / Florida / Miami
Contact: Kidney Cancer Association
Email: outreachregistration@niu.edu

2nd PCR-CIT China Chengdu Valves
Nov 4 - 6, 2016
China / Chengdu Cardiology
Contact: Pcr-Cit China Chengdu Valves Organizing Committee
Fax: 011-86-28-8542-3276
Email: yuanningxu@pcrccv.com

6th Asia-Pacific Osteoporosis Iof Regional Meeting
Nov 4 - 6, 2016
Singapore / Singapore
Contact: Lee See Ting, Meeting Secretariat, International Osteoporosis Foundation
Phone: 011-41-22-994-0100; Fax: 011-41-22-994-0101
Email: singapore2016@iofbonehaealth.org

7th International Hip Arthroscopy Meeting
Nov 4 - 5, 2016
Germany / Munich Orthopedics
Contact: Stefanie Matt, Project Manager Conventions, Intercongress Freiburg
Phone: 011-49-761-696-99243
Fax: 011-49-761-696-9911
Email: stefanie.matt@intercongress.de

Modern Management of Fibroids
Nov 4, 2016
United Kingdom / London
Contact: Linda Almici, Royal College of Obstetricians & Gynaecologists
Phone: 011-44-20-7772-6437
Email: lalmici@rcog.org.uk

Neuro/ENT In Hong Kong
Nov 4 - 6, 2016
China / Hong Kong
Contact: International Institute for Continuing Medical Education
Phone: 205-467-0290
Email: iicmemail@gmail.com

2016 International meeting on Emerging Diseases & Surveillance
Nov 4 - 7, 2016
Austria / Vienna
Contact: International Society for Infectious Diseases
Phone: 617-277-0551
Fax: 617-278-9113
Email: info@isid.org

7th International Hip Arthroscopy Meeting
Nov 4 - 5, 2016
Germany / Munich
Contact: Stefanie Matt, Project Manager Conventions, Intercongress Freiburg
Phone: 011-49-761-696-99243
Fax: 011-49-761-696-9911
Email: stefanie.matt@intercongress.de

Neuro/ENT in Hong Kong
Nov 4 - 6, 2016
China / Hong Kong
Contact: International Institute for Continuing Medical Education
Phone: 205-467-0290
Email: IICMEmail@gmail.com

3rd Singapore Advanced Rhinoplasty Fresh Frozen Cadaveric Dissection course
Nov 6 - 9, 2016
Singapore / Singapore
Contact: Secretariat, Course Secretariat, Khoo Teck Puat Hospital
Email: SingaporeENTcourses@barakpco.com

Operative Skills in Urology: Modules 3 & 4
Nov 7 - 8, 2016
United Kingdom / London
Contact: Education, Royal College of Surgeons Of England
Phone: 011-44-20-7869-6300
Email: education@rcseng.ac.u
Combined Courses: Introduction to Abdominal/Primary Care & Ob/Gyn Ultrasound Education
Nov 7 - 12, 2016
United States / Florida / St. Pete Beach
Contact: Gulfcoast Ultrasound Institute
Phone: 800-619-1900 Or 727-363-4500
Fax: 727-363-0811

50th Annual congress of Turkish Ophthalmology society
Nov 9 - 13, 2016
Turkey / Antalya
Contact: Ms. Nagihan Tunali, Project Coordinator, Global Turizm Organizasyon Inc.
Phone: 011-90-21-2282-9232
Email: todnet@globalturizm.com.tr

3rd Breast Cancer in young women conference
Nov 10 - 12, 2016
Switzerland / Lugano
Contact: European School of Oncology
Email: eso@eso.net

2016 American College of Allergy, Asthma & Immunology (ACAAI) Annual Scientific Meeting
Nov 10 - 14, 2016
United States / California / San Francisco
Contact: Acaai, Acaai
Phone: 847-427-1200
Email: meeting@acaaai.org

2016 Annual Scientific Update in Urogynecology
Nov 10 - 11, 2016
United Kingdom / London
Contact: Karen Collings, Royal College Of Obstetricians & Gynaecologists
Phone: 011-44-20-7772-6312
Email: kcollings@rcog.org.uk

24th World Congress on Controversies in Obstetrics, Gynecology & Infertility
Nov 10 - 13, 2016
Netherlands / Amsterdam
Contact: Ilana Rabinoff-Sofer, Congressmed
Phone: +41-22-339-9985
Email: cogi@congressmed.com

2nd Annual Genome Editing Congress
Nov 10 - 11, 2016
United Kingdom / London
Contact: Oxford Global
Phone: 011-44-18-6524-8455
Fax: 011-44-18-6525-0985
Email: info@oxfordglobal.co.uk

2016 Advanced Medicine congress
Nov 11 - 12, 2016
United Arab Emirates / Abu Dhabi
Contact: Darren Eletr, Marketing Communications Coordinator, Imperial College London Diabetes Centre
Phone: 011-971-3-746-4848
Email: cme@icldc.ae

12th Hanover Arthroscopy & Arthroplasty course
Nov 11 - 12, 2016
Germany / Hanover
Contact: Congress Office, Intercongress GmbH
Phone: 011-49-611-977-160
Email: info.wiesbaden@intercongress.de

21st Congress of the Asian Pacific Society of Respirology
Nov 12 - 15, 2016
Thailand / Bangkok
Contact: Warapa Saipow, Kenes Asia (Thailand) Co., Ltd.
Phone: 011-66-2748-7881
Email: wsaipow@kenes.com

3rd Singapore Facial Fracture & Soft Tissue Reconstruction - Fresh frozen cadaveric dissection course
Nov 13 - 16, 2016
Singapore / Singapore
Contact: Secretariat, Course Secretariat, Khoo Teck Puat Hospital
Email: SingaporeENTcourses@barakpco.com

Nov 14 - 18, 2016
Australia / Adelaide
Contact: Conference Secretariat, Australasian Sexual Health Alliance
Phone: 011-61-2-8204-0770; Fax: 011-61-2-8204-0779
Email: shconference@ashm.org.au

Definitive Surgical trauma skills
Nov 14 - 15, 2016
United Kingdom / London
Contact: Education, Royal College of Surgeons of England
Phone: 011-44-20-7869-6300
Email: education@rcseng.ac.uk

New methods of Diagnosis, Treatment & Prevention of Atherosclerosis
Nov 14, 2016
Cyprus / Coral Bay
Contact: Dr Charles Williams, Nbscience Limited
Phone: 011-38-63-277-6465
Email: uk@nbscience.com
10th Bit World congress of Regenerative Medicine & Stem Cells  
Nov 16 - 19, 2016  
China / Nanjing  
Contact: Mr. David Zhang, david@bitcongress.com, BIT Congress, Inc.  
Email: david@bitcongress.com

3rd Congress on Paediatric Palliative Care: A global gathering  
Nov 16 - 19, 2016  
Italy / Rome  
Contact: Congress Secretariat, Fondazione Maruzza  
Phone: 011-39-6-329-0609  
Fax: 011-39-6-3629-2743  
Email: icppc@maruzza.org

10th International congress on early onset Scoliosis  
Nov 17 - 18, 2016  
Netherlands / Utrecht  
Contact: Growing Spine Foundation  
Phone: 414-276-6445; Fax: 414-276-3349  
Email: info@growingspine.org

10th International congress on Peritoneal Surface Malignancies  
Nov 17 - 19, 2016  
District of Columbia / Washington  
Contact: Medstar Health Georgetown University  
Phone: 855-546-0672 Or 202-877-8220  
Email: whcme@gmail.com

13th Global summit on Cancer Therapy  
Nov 17 - 19, 2016  
United Arab Emirates / Dubai  
Contact: Celina Crystal, OMICS International  
Phone: 800-216-6499  
Fax: 650-618-1414  
Email: cancermiddleeast@conferenceseries.net

2016 International Society of Geriatric Oncology (SIOG) Annual conference  
Nov 17 - 19, 2016  
Italy / Milan  
Contact: SIOG Head Office  
Phone: 011-41-22-552-3305; Fax: 011-41-22-552-3306  
Email: info@sioig.org

Advanced skills in Coloproctology  
Nov 22, 2016  
United Kingdom / London  
Contact: Education, Royal College of Surgeons of England  
Phone: 011-44-20-7869-6300  
Email: education@rcseng.ac.uk

Operative Skills In Neurosurgery  
Nov 23 - 25, 2016  
United Kingdom / London  
Contact: Education, Royal College of Surgeons of England  
Phone: 011-44-20-7869-6300  
Email: education@rcseng.ac.uk

Advances in Transfusion Medicine  
Nov 24 - 25, 2016  
United Kingdom / London  
Contact: Royal College of Pathologists  
Phone: 011-44-20-7451-6700  
Email: info@rcpath.org

Intermediate skills in Laparoscopic surgery  
Nov 24 - 25, 2016  
United Kingdom / London  
Contact: Education, Royal College of Surgeons of England  
Phone: 011-44-20-7869-6300  
Email: education@rcseng.ac.uk

Nutrition in Liver Disease  
Nov 25 - 26, 2016  
Slovenia / Ljubljana  
Contact: European Association for the Study of the Liver  
Phone: 011-41-22-807-0360  
Fax: 011-41-22-328-0724  
Email: easlooffice@easlooffice.eu

Diagnostic & Operative Hysteroscopy  
Nov 29 - Dec 1, 2016  
United Kingdom / London  
Contact: Linda Almici, Royal College of Obstetricians & Gynaecologists  
Phone: 011-44-20-7772-6437  
Email: lalmici@rcog.org.uk

2016 World Congress on Clinical Trials in Diabetes  
Nov 30 - Dec 1, 2017  
Germany / Berlin  
Contact: Ilana Berkowitz, Project Manager, Bioevents  
Phone: 011-44-20-3051-4032  
Fax: 011-44-20-3051-4032  
Email: wc1d@bioevents.net

22nd World congress of Social Psychiatry  
Nov 30 - Dec 4, 2016  
India / New Delhi  
Contact: Prof R.K.Chadda, Professor, Psychiatry, AIIMS, New Delhi and Org. Chairperson, Indian Association of Social Psychiatry (IASP)  
Phone: 011-91-172-266-5253  
Email: secretariat@wasp2016.com
14th Annual world congress on Insulin Resistance, Diabetes & Cardiovascular disease
Dec 1 - 3, 2016
United States / California / Los Angeles
Contact: Kaley Diep, Executive Assistant, Metabolic Endocrine Education Foundation (MEEF)
Phone: 818-342-1889
Fax: 818-342-1538
Email: admin@wcir.org

2nd International Congress on Neuro-Immunology & Therapeutics
Dec 1 - 3, 2016
Georgia / Atlanta
Contact: Jennifer Jones, Omics International
Phone: 888-843-8169
Fax: 650-618-1417
Email: neuroimmunology@conferenceseries.net

Emergency Skills in Oral & Maxillofacial Surgery
Dec 1 - 3, 2016
United Kingdom / London
Contact: Education, Royal College of Surgeons of England
Phone: 011-44-20-7869-6300
Email: education@rcseng.ac.uk

19th International Union against Sexually Transmitted Infections Asia-Pacific Conference
Dec 1 - 3, 2016
Japan / Okayama
Contact: Administrative Secretariat, Med-Gakkai
Email: 19iusti@med-gakkai.org

2016 Vitiligo International Symposium
Dec 2 - 3, 2016
Italy / Rome
Contact: Organizing Secretariat, Quality Congress
Phone: 011-39-6-6651-4670
Email: info@vis2016.org

9th World Congress on Prevention of Diabetes & Its complications (WCPD9)
Dec 2-4, 2016
Georgia / Atlanta
Contact: Wcpd9
Fax: 011-20-2-2671-8421
Email: info@wcpd9.com

12th Annual Liver Transplantation Symposium
Dec 3, 2016
United States / Pennsylvania / Hershey
Contact: Department of Continuing Education, Pennsylvania State University
Phone: 717-531-6483
Fax: 717-531-5604
Email: continuinged@hmc.psu.edu

17th International Association for the Study of Lung Cancer (IASLC) World Conference on Lung Cancer
Dec 4 - 7, 2016
Austria / Vienna
Contact: Pia Hirsch, Iaslc
Email: pia.hirsch@iaslc.org

One day essentials | Ophthalmology
Dec 5, 2016
United Kingdom / London
Contact: Conferences, Royal College of General Practitioners
Phone: 011-44-20-3188-7658
Email: rcgpconferences@rcgp.org.uk

2016 Emirates Society of Emergency Medicine Scientific Conference
Dec 7 - 10, 2016
United Arab Emirates / Dubai
Contact: Kris Olarte, Mci Middle East
Phone: 011-971-4-311-6300; Fax: 011-971-4-311-6301
Email: esem@mci-group.com

16th International forum on Mood & Anxiety Disorders
Dec 8-10, 2016
Italy / Rome
Contact: Publi Creations
Phone: 011-377-9797-3555; Fax: 011-377-9797-3550
Email: ifmad@publicreations.com

2016 International Psychogeriatric Association (IPA) Asian Regional Meeting
Dec 9 - 11, 2016
Taiwan / Taipei
Contact: IPA
Phone: 414-918-9889
Email: info@ipa-online.org

Musculoskeletal Ultrasound
Dec 9 - 11, 2016
Belgium / Brussels
Contact: Medipoint
Phone: 011-32-5140-7674

Paediatric Inflammatory Bowel disease study day
Dec 9, 2016
United Kingdom / London
Contact: Academy for Paediatric Gastroenterology
Phone: 011-44-77-8591-4542
Email: query@a-p-g.co.uk

Update on IV Fluids
Dec 11-14, 2016
Italy / Rome
Contact: Marie-Rose Andre, Secretary, Erasme Hospital Intensive Care Department
Phone: 011-32-2-555-3380
Fax: 011-32-2-555-4555
Email: secrjv@ulb.ac.be
2016 Current Concepts in **Joint Replacement** Winter meeting  
Dec 14 - 17, 2016  
*United States / Florida / Orlando*  
Contact: Current Concepts Institute  
Phone: 216-295-1900  
Fax: 216-295-9955  
Email: info@ccjr.com

5th Emirates international **Urological** conference  
Dec 15-17, 2016  
*United Arab Emirates / Dubai*  
Contact: Shilpa Alakkal, Meeting Minds Experts  
Phone: 011-971-4-427-0492  
Email: urology@meetingmindsdubai.com

6th International **Oncoplastic Breast Surgery** symposium  
Dec 16 - 18, 2016  
*Thailand / Bangkok*  
Contact: Secretariat Office, Thaland Section of The International College of Surgeons  
Phone: 011-66-81-701-8345  
Fax: 011-66-2-950-7423  
Email: iopbs.congress@gmail.com

2017 Asia **PCR** Singapore Live  
Jan 19 - 21, 2017  
*Singapore / Singapore*  
Contact: Europa Organisation  
Phone: 011-33-5-3445-2645  
Email: europa@europa-organisation.com

**Autism, ADHD & developmental disabilities** through the lifespan Hawaiian cruise  
Jan 21 - 28, 2017  
*United States / Hawaii / Honolulu*  
Contact: Continuing Education, Continuing Education, Inc  
Phone: 800-422-0711  
Email: registrar@continuingeducation.net

Arrhythmias & the Heart: A **Cardiovascular** update  
Jan 23 - 27, 2017  
*United States / Hawaii / Big Island*  
Contact: Charlene Tri, Mayo Clinic  
Phone: 800-283-6296  
Email: ctr@mayo.edu

Basic techniques in **Arthroscopic Surgery**  
Jan 24 - 25, 2017  
*United Kingdom / London*  
Contact: Education, Royal College of Surgeons of England  
Phone: 011-44-20-7869-6300  
Email: education@rcseng.ac.uk

Intermediate Skills in **Laparoscopic Surgery**  
Jan 24 - 25, 2017  
*United Kingdom / London*  
Contact: Education, Royal College of Surgeons Of England  
Phone: 011-44-20-7869-6300  
Email: education@rcseng.ac.uk

24th International Symposium on **Pancreatic & Biliary Endoscopy**  
Jan 26 - 29, 2017  
*United States / California / Los Angeles*  
Contact: Office of CME, Cedars Sinai Medical Center  
Phone: 310-423-5548  
Email: cme@cshs.org

Basic Techniques in **Arthroscopic Surgery**  
Jan 24 - 25, 2017  
*United Kingdom / London*  
Contact: Education, Royal College of Surgeons of England  
Phone: 011-44-20-7869-6300  
Email: education@rcseng.ac.uk

Intermediate Skills in **Laparoscopic Surgery**  
Jan 26 - 29, 2017  
*United States / California / Los Angeles*  
Contact: Office of CME, Cedars Sinai Medical Center  
Phone: 310-423-5548  
Email: cme@cshs.org
Advanced Arthroscopic Knee
Jan 26 - 27, 2017
United Kingdom / London
Contact: Education, Royal College of Surgeons of England
Phone: 011-44-20-7869-6300
Email: education@rcseng.ac.uk

Operative Skills in Neonatal & Paediatric Surgery
Feb 1-2, 2017
United Kingdom / London
Contact: Education, Royal College of Surgeons of England
Phone: 011-44-20-7869-6300
Email: education@rcseng.ac.uk

3rd Seminar on Tendon Transfers of the Upper Limb
Feb 2 - 4, 2017
Greece / Thessaloniki
Contact: Premium Congress & Social Events Solutions
Phone: 011-30-23-1021-9407
Email: premium.conf@gmail.com

Renal Pathology for the Nephrologist
Feb 2 - 3, 2017
United Kingdom / London
Contact: Miss Anjli Jagpal, Course Organiser, Imperial College London
Email: a.jagpal@imperial.ac.uk

Head and Neck MRI
Feb 6 - 10, 2017
Austria / Vienna
Contact: Walter Rijsselaere, Erasmus Mri Course
Email: walter.rijsselaere@uzbrussel.be

Quantitative MRI in White Matter disorders
Feb 7 - 10, 2017
Canada / British Columbia / Vancouver
Contact: International Society for Magnetic Resonance in Medicine
Email: info@ismrm.org

2017 Paris International Shoulder Course
Feb 9 - 11, 2017
France / Paris
Contact: Eventime Group
Phone: 011-33-4-9194-5472; Fax: 011-33-4-9158-5494
Email: contact@paris-shoulder-course.com

3rd Asia - Australia congress on controversies in Ophthalmology
Feb 9 - 12, 2017
South Korea / Seoul
Contact: Natalie Ross, Comtecmed
Phone: 011-972-3-566-6166
Email: cophyaa@comtecmed.com

7th Emirates Diabetes & Endocrine congress
Feb 16 - 18, 2017
United Arab Emirates / Dubai
Contact: Kris Olarte, Mci Middle East
Phone: 011-971-4-311-6300; Fax: 011-971-4-311-6301
Email: edec@mci-group.com

1st International Conference on Zika Virus
Feb 22 - 25, 2017
United States / District of Columbia / Washington
Contact: Conference, Secretariat, Target Conferences
Phone: 972-3-517-5150
Email: zika@target-conferences.com

31st International Papillomavirus Conference
Feb 28 - Mar 4, 2017
South Africa / Cape Town
Contact: Hpv 2017 Secretariat, Kenes International
Phone: 011-41-22-906-9160
Email: hpv2017@kenes.com

20th International Society of Dermatopathology (ISDP) Joint Meeting
Mar 1 - 2, 2017
United States / Florida / Lake Buena Vista
Contact: Diana Baughman, Manager, Isdp
Phone: 650-726-5481; Fax: 650-726-5481
Email: intsocdp@sbcglobal.net

Care of the Critically Ill Surgical Patient
Mar 2 - 3, 2017
United Kingdom / London
Contact: Education, Royal College of Surgeons Of England
Phone: 011-44-20-7869-6300
Email: education@rcseng.ac.uk

Practical Ophthalmology for the Non-Ophthalmologist
Mar 4, 2017
Canada / British Columbia / Vancouver
Contact: Continuing Professional Development, University Of British Columbia
Phone: 604-875-5101; Fax: 604-875-5078
Email: cpd.info@ubc.ca

12th Congress of Asia & Oceania Thyroid Association
Mar 16 - 19, 2017
South Korea / Busan
Contact: Lucy Choi, Secretariat, Mci Korea
Phone: 011-82-708-766-9568; Fax: 011-82-2-576-9945
Email: office@aota2017.com

2017 International congress on clinical trials in Oncology & Hemato-Oncology
Mar 16 - 17, 2017
United Kingdom / London
Contact: Debi Bert, Assistant Project Manager, Bio Events
Email: info@bioevents.net
WHO-Facts Sheet

1. Lead Poisoning and Health
2. Blood Safety and Availability
3. Preventing Unsafe Abortion
4. Blindness: Vision 2020
5. Hepatitis C
6. Trachoma

Compiled and edited by
Babichan K Chandy

Kuwait Medical Journal 2016; 48 (3) : 277 - 289

1. LEAD POISONING AND HEALTH

Overview

Lead is a naturally occurring toxic metal found in the Earth’s crust. Its widespread use has resulted in extensive environmental contamination, human exposure and significant public health problems in many parts of the world.

Important sources of environmental contamination include mining, smelting, manufacturing and recycling activities, and, in some countries, the continued use of leaded paint, leaded gasoline, and leaded aviation fuel. More than three quarters of global lead consumption is for the manufacture of lead-acid batteries for motor vehicles. Lead is, however, also used in many other products, for example pigments, paints, solder, stained glass, crystal vessels, ammunition, ceramic glazes, jewellery, toys and in some cosmetics and traditional medicines. Drinking water delivered through lead pipes or pipes joined with lead solder may contain lead. Much of the lead in global commerce is now obtained from recycling.

Young children are particularly vulnerable to the toxic effects of lead and can suffer profound and permanent adverse health effects, particularly affecting the development of the brain and nervous system. Lead also causes long-term harm in adults, including increased risk of high blood pressure and kidney damage. Exposure of pregnant women to high levels of lead can cause miscarriage, stillbirth, premature birth and low birth weight, as well as minor malformations.

KEY FACTS

- Lead is a cumulative toxicant that affects multiple body systems and is particularly harmful to young children.
- Lead exposure is estimated to account for 674,000 deaths per year with the highest burden in low- and middle-income countries.
- Lead exposure is estimated to account for 9.8% of the global burden of idiopathic intellectual disability, 4% of the global burden of ischaemic heart disease, and 5% of the global burden of stroke.
- Lead in the body is distributed to the brain, liver, kidney and bones. It is stored in the teeth and bones, where it accumulates over time. Human exposure is usually assessed through the measurement of lead in blood.
- There is no known level of lead exposure that is considered safe.
- Lead poisoning is entirely preventable.

Sources and routes of exposure

People can become exposed to lead through occupational and environmental sources. This mainly results from:

- inhalation of lead particles generated by burning materials containing lead, for example, during smelting, recycling, stripping leaded paint and using leaded gasoline or leaded aviation fuel; and
- ingestion of lead-contaminated dust, water (from leaded pipes), food (from lead-glazed or lead-soldered containers).

Address correspondence to:
Office of the Spokesperson, WHO, Geneva. Tel.: (+41 22) 791 2599; Fax (+41 22) 791 4858; Email: inf@who.int; Web site: http://www.who.int/
The use of some traditional cosmetics and medicines can also result in lead exposure.

Young children are particularly vulnerable because they absorb 4 – 5 times as much ingested lead as adults from a given source. Moreover, children’s innate curiosity and their age-appropriate hand-to-mouth behaviour result in their mouthing and swallowing lead-containing or lead-coated objects, such as contaminated soil or dust and flakes from decaying lead-containing paint. This route of exposure is magnified in children with pica (persistent and compulsive cravings to eat non-food items), who may, for example pick away at, and eat, leaded paint from walls, door frames and furniture. Exposure to lead-contaminated soil and dust resulting from battery recycling and mining has caused mass lead poisoning and multiple deaths in young children in Nigeria, Senegal and other countries.

Once lead enters the body, it is distributed to organs such as the brain, kidneys, liver and bones. The body stores lead in the teeth and bones where it accumulates over time. Lead stored in bone may be remobilized into the blood during pregnancy, thus exposing the fetus. Undernourished children are more susceptible to lead because their bodies absorb more lead if other nutrients, such as calcium, are lacking. Children at highest risk are the very young (including the developing fetus) and the impoverished.

Health effects of lead poisoning on children

Lead has had serious consequences for the health of children. At high levels of exposure, lead attacks the brain and central nervous system to cause coma, convulsions and even death. Children who survive severe lead poisoning may be left with mental retardation and behavioural disorders. At lower levels of exposure that cause no obvious symptoms, and that previously were considered safe, lead is now known to produce a spectrum of injury across multiple body systems. In particular lead affects children’s brain development resulting in reduced intelligence quotient (IQ), behavioural changes such as reduced attention span and increased antisocial behaviour, and reduced educational attainment. Lead exposure also causes anaemia, hypertension, renal impairment, immunotoxicity and toxicity to the reproductive organs. The neurological and behavioural effects of lead are believed to be irreversible.

There is no known safe blood lead concentration. But it is known that, as lead exposure increases, the range and severity of symptoms and effects also increases. Even blood lead concentrations as low as 5 µg/dl, once thought to be a “safe level”, may result in decreased intelligence in children, behavioural difficulties and learning problems.

Encouragingly, the successful phasing out of leaded gasoline in most countries, together with other lead control measures, has resulted in a significant decline in population-level blood lead concentrations.

WHO response

WHO has identified lead as one of ten chemicals of major public health concern, needing action by Member States to protect the health of workers, children and women of reproductive age.

WHO has made available through its website a range of information on lead, including information for policy makers, technical guidance and advocacy materials.

WHO is currently developing guidelines on the prevention and management of lead poisoning, which will provide policy-makers, public health authorities and health professionals with evidence-based guidance on the measures that they can take to protect the health of children and adults from lead exposure.

Since leaded paint is a continuing source of exposure in many countries, WHO has joined with the United Nations Environment Programe to form the Global Alliance to Eliminate Lead Paint. This is a cooperative initiative to focus and catalyse efforts to achieve international goals to prevent children’s exposure to lead from leaded paints and to minimize occupational exposures to such paint. Its broad objective is to promote a phase-out of the manufacture and sale of paints containing lead and eventually eliminate the risks that such paints pose.

The Global Alliance to Eliminate Lead Paint is an important means of contributing to the implementation of paragraph 57 of the Plan of Implementation of the World Summit on Sustainable Development and to resolution II/48 of the Strategic Approach to International Chemicals Management (SAICM), which both concern the phasing of lead paint.

2. Blood Safety and Availability

Overview

Blood transfusion saves lives and improves health, but many patients requiring transfusion do not have timely access to safe blood. Providing safe and adequate blood should be an integral part of every country’s national health care policy and infrastructure.

Key Facts

- Of the 112.5 million blood donations collected globally, approximately half of these are collected in the high-income countries, home to 19% of the world’s population.
• In low-income countries, up to 65% of blood transfusions are given to children under 5 years of age; whereas in high-income countries, the most frequently transfused patient group is over 65 years of age, accounting for up to 76% of all transfusions.
• The blood donation rate in high-income countries is 33.1 donations per 1000 people; 11.7 donations in middle-income countries and 4.6 donations in low-income countries.
• An increase of 10.7 million blood donations from voluntary unpaid donors has been reported from 2008 to 2013. In total, 74 countries collect over 90% of their blood supply from voluntary unpaid blood donors; however, 72 countries collect more than 50% of their blood supply from family/replacement or paid donors.
• Only 43 of 175 reporting countries produce plasma-derived medicinal products (PDMP) through the fractionation of plasma collected in the country, whereas the majority of the other 132 countries import PDMP from abroad.

National blood policy and organization
WHO recommends that all activities related to blood collection, testing, processing, storage and distribution be coordinated at the national level through effective organization and integrated blood supply networks. The national blood system should be governed by national blood policy and legislative framework to promote uniform implementation of standards and consistency in the quality and safety of blood and blood products.

In 2013, 73%, or 122 out of 167 countries, had a national blood policy. Overall, 65%, or 108 out of 167 countries, have specific legislation covering the safety and quality of blood transfusion, including:
• 79% of high-income countries;
• 64% of middle-income countries; and
• 41% of low-income countries.

Blood supply
About 112.5 million blood donations are collected worldwide. More than half of these are collected in high-income countries, home to 19% of the world’s population.

About 13,000 blood centres in 176 countries report collecting a total of 110 million donations. Collections at blood centres vary according to income group. The median annual donations per blood centre is 5400 in the low- and middle-income countries, as compared to 16,000 in the high-income countries.

There is a marked difference in the level of access to blood between low- and high-income countries. The whole blood donation rate is an indicator for the general availability of blood in a country. The median blood donation rate in high-income countries is 33.1 donations per 1000 people. This compares with 11.7 donations per 1000 people in middle-income countries, and 4.6 donations per 1000 people in low-income countries.

Seventy countries report collecting fewer than 10 donations per 1000 people. Of these, 38 countries are in WHO’s African Region, six in the Americas, six in the Eastern Mediterranean, five in Europe, six in South-Eastern Asia and nine in the Western Pacific. All are low- or middle-income countries.

BLOOD DONORS
Age and gender of blood donors
Data about the gender profile of blood donors show that globally 28% of blood donations are given by women, although this ranges widely. In 16 of the 119 reporting countries, less than 10% of donations are given by female donors.

The age profile of blood donors shows that, proportionally, more young people donate blood in low- and middle-income countries than in high-income countries. Demographic information of blood donors is important for formulating and monitoring recruitment strategies.

Types of blood donors
There are three types of blood donors:
• voluntary unpaid
• family/replacement
• paid.

An adequate and reliable supply of safe blood can be assured by a stable base of regular, voluntary, unpaid blood donors. These donors are also the safest group of donors as the prevalence of bloodborne infections is lowest among this group. World Health Assembly resolution WHA63.12 urges all Member States to develop national blood systems based on voluntary unpaid donations and to work towards the goal of self-sufficiency.

Data reported to WHO shows significant increases of voluntary unpaid blood donations in low- and middle-income countries:
• An increase of 10.7 million blood donations from voluntary unpaid donors from 2008 to 2013 has been reported by 159 countries. The highest increase of voluntary unpaid blood donations is in the African (85%) and South-East Asian (74%) Regions. The maximum increase in absolute numbers was reported the South-East Asia region (5.3 million donations), followed by the Western Pacific Region (2.8 million donations).
• Seventy-four countries collect more than 90% of their blood supply from voluntary unpaid blood
donations (39 high-income countries, 26 middle-income countries and nine low-income countries). This includes 62 countries with 100% (or more than 99%) of their blood supply from voluntary unpaid blood donors.

- In 72 countries, more than 50% of the blood supply is still dependent on family/replacement and paid blood donors (11 high-income countries, 45 middle-income countries and 16 low-income countries).
- Twenty-four countries still report collecting paid donations in 2013, around 1,650,000 donations in total.

**Blood screening**

WHO recommends that all blood donations should be screened for infections prior to use. Screening should be mandatory for HIV, hepatitis B, hepatitis C and syphilis. Blood screening should be performed according to the quality system requirements.

- Sixteen countries are not able to screen all donated blood for one or more of the above infections.
- Irregular supply of test kits is one of the most commonly reported barriers to screening.
- 81% blood screening laboratories in high-income countries are monitored through external quality assessment schemes, as compared to 55% in middle-income countries and 34% in low-income countries.
- The prevalence of transfusion-transmissible infections (TTI) in blood donations in high-income countries is considerably lower than in low- and middle-income countries (Table 1).

<table>
<thead>
<tr>
<th>Income Group</th>
<th>HIV</th>
<th>HBV</th>
<th>HCV</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-income countries</td>
<td>0.003% (0.001% – 0.040%)</td>
<td>0.030% (0.008% – 0.180%)</td>
<td>0.020% (0.003% – 0.160%)</td>
</tr>
<tr>
<td>Middle-income countries</td>
<td>0.120% (0.020% – 0.340%)</td>
<td>0.910% (0.280% – 2.460%)</td>
<td>0.320% (0.090% – 0.690%)</td>
</tr>
<tr>
<td>Low-income countries</td>
<td>1.080% (0.560% – 2.690%)</td>
<td>3.700% (3.340% – 8.470%)</td>
<td>1.030% (0.670% – 1.800%)</td>
</tr>
</tbody>
</table>

These differences reflect the variation in prevalence among population who are eligible to donate blood, the type of donors (such as voluntary unpaid blood donors from lower risk populations) and the effectiveness of the system of educating and selecting donors.

**Blood processing**

Blood collected in an anticoagulant can be stored and transfused to a patient in an unmodified state. This is known as ‘whole blood’ transfusion. However, blood can be used more effectively if it is processed into components, such as red cell concentrates, platelet concentrates, plasma and cryoprecipitate. In this way, it can meet the needs of more than one patient.

The capacity to provide patients with the different blood components they require is still limited in low-income countries: 43% of the blood collected in low-income countries is separated into components, 78% in middle-income countries and 96% in high-income countries.

**Supply of plasma-derived medicinal products (PDMP)**

World Health Assembly resolution WHA63.12 urges Member States to establish, implement and support nationally-coordinated, efficiently-managed and sustainable blood and plasma programmes according to the availability of resources, with the aim of achieving self-sufficiency. It is the responsibility of individual governments to ensure sufficient and equitable supply of plasma-derived medicinal products namely immunoglobulins and coagulation factors, which are needed to prevent and treat a variety of serious conditions that occur worldwide.

For forty-three countries (26 high-income, 16 middle-income, one low-income) of the 175 reporting countries reported producing all or part of the PDMP through the fractionation (for example, domestic or/and contract fractionation) of plasma collected in the country.

One hundred and six countries report that all PDMP are imported: 18 countries report that no PDMP were used during the reporting period; eight countries report that plasma collected in the country was sold to the manufacturers of plasma-derived medicinal products and products purchased from PMDP suppliers in the market. Around 14.3 million litres of plasma from 43 reporting countries (22 high-income countries, 12 middle-income countries and one low-income country, covering a population of 2.76 billion) was fractionated for the production of PDMP during the year. This includes around 50% plasma recovered from the whole blood donations.

**Clinical use of blood**

Unnecessary transfusions and unsafe transfusion practices expose patients to the risk of serious adverse transfusion reactions and transfusion-transmissible infections. Unnecessary transfusions also reduce the availability of blood products for patients who are in need.
WHO recommends the development of systems, such as hospitals transfusion committees and haemovigilance, to monitor and improve the safety of transfusion processes. In this regard:

- One hundred and twenty-five countries have national guidelines on the appropriate clinical use of blood.
- Transfusion committees are present in 67% of the hospitals performing transfusions in high-income countries and in 34% of the hospitals in middle- and low-income countries.
- Clinical audits are conducted in 54% of hospitals performing transfusion in high-income countries and in 42% of hospitals in the middle- and low-income countries.
- Systems for reporting adverse transfusion events are present in 92% of hospitals performing transfusion in high-income countries and 40% in middle- and low-income countries.
- 72% of high-income countries have a national haemovigilance system, compared to only 28% of middle- and low-income countries.

**Blood transfusions**

There are great variations between countries in terms of the age distribution of transfused patients. For example, in the high-income countries, the most frequently transfused patient group is over 65 years, which accounts for up to 76% of all transfusions. In the low-income countries, up to 65% of transfusions are for children under the age of 5 years.

In high-income countries, transfusion is most commonly used for supportive care in cardiovascular surgery, transplant surgery, massive trauma, and therapy for solid and haematological malignancies. In low- and middle-income countries it is used more often to manage pregnancy-related complications and severe childhood anaemia.

**WHO response**

The risk of transmission of serious infections, including HIV and hepatitis, through unsafe blood and chronic blood shortages brought global attention to the importance of blood safety and availability. With the goal of ensuring universal access to safe blood and blood products, WHO has been at the forefront to improve blood safety and availability, and recommends the following integrated strategy for blood safety and availability:

- Establishment of a national blood system with well-organized and coordinated blood transfusion services, effective evidence-based and ethical national blood policies, and legislation and regulation, that can provide sufficient and timely supplies of safe blood and blood products to meet the transfusion needs of all patients.
- Collection of blood, plasma and other blood components from low-risk, regular, voluntary unpaid donors through the strengthening of donation systems, and effective donor management, including care and counselling.
- Quality-assured screening of all donated blood for transfusion-transmissible infections (TTIs), including HIV, hepatitis B, hepatitis C and syphilis, confirmatory testing of the results of all donors screen-reactive for infection markers, blood grouping and compatibility testing, and systems for processing blood into blood products (blood components for transfusion and plasma derived-medicinal products), as appropriate, to meet health care needs.
- Rational use of blood and blood products to reduce unnecessary transfusions and minimize the risks associated with transfusion, the use of alternatives to transfusion, where possible, and safe and good clinical transfusion practices, including patient blood management.
- Step-wise implementation of effective quality systems, including quality management, standards, good manufacturing practices, documentation, training of all staff, and quality assessment.
- Through its Blood and Transfusion Safety programme, WHO supports countries in developing national blood systems to ensure timely access to safe and sufficient supplies of blood and blood products and good transfusion practices to meet the patients’ needs. The programme provides policy guidance and technical assistance to countries for ensuring universal access to safe blood and blood products and work towards self-sufficiency in safe blood and blood products based on voluntary unpaid blood donation to achieve universal health coverage.

**Data source:** This fact sheet is based on the data obtained through the WHO Global Database on Blood Safety (GDBS) for the year 2013 which were reported by 156 countries. Overall, responses received from 179 countries cover 98.6% of the world’s population.

### 3. Preventing Unsafe Abortion

**Overview**

Unsafe abortion occurs when a pregnancy is terminated either by persons lacking the necessary skills or in an environment that does not conform to minimal medical standards, or both.
The persons, skills and medical standards considered safe in the provision of induced abortions are different for medical abortion (which is performed with drugs alone), and surgical abortion (which is performed with a manual or electric aspirator). Skills and medical standards required for safe abortion also vary depending upon the duration of the pregnancy.

**KEY FACTS**

- Between 2010 - 2014:
  - On an average, 56 million induced (safe and unsafe) abortions occurred worldwide each year.
  - There were 35 induced abortions per 1000 women aged between 15 - 44 years.
  - 25% of all pregnancies ended in an induced abortion.
  - The rate of abortions was higher in developing regions than in developed regions.
- Around 22 million unsafe abortions are estimated to take place worldwide each year, almost all in developing countries.
- In 2008, there were an estimated 47,000 deaths due to unsafe abortion. Africa is disproportionately affected, with nearly two-thirds of all abortion-related deaths.
- Around five million women are admitted to hospital as a result of unsafe abortion every year in developing countries. While more than three million women who have complications following unsafe abortion do not receive care.
- The annual cost of treating major complications from unsafe abortion is estimated at $680 million.
- When induced abortion is performed by appropriately trained persons using correct techniques it is a safe procedure.
- Almost every abortion death and disability could be prevented through sexuality education, use of effective contraception, provision of safe, legal induced abortion, and timely care for complications.

- Women, including adolescents, with unwanted pregnancies often resort to unsafe abortion when they cannot access safe abortion. Barriers to accessing safe abortion include:
  - restrictive laws;
  - poor availability of services;
  - high cost;
  - stigma;
  - conscientious objection of health-care providers; and
  - unnecessary requirements such as:
    - mandatory waiting periods.
    - mandatory counselling.
  - provision of misleading information
  - third-party authorization
  - medically unnecessary tests.

**Scope of the problem**

Based on estimates for 2008, there are approximately 22 million unsafe abortions annually, resulting in 47,000 deaths, and more than five million complications such as:

- incomplete abortion (failure to remove or expel all of the pregnancy tissue from the uterus)
- haemorrhage (heavy bleeding)
- infection
- uterine perforation (caused when the uterus is pierced by a sharp object)
- damage to the genital tract and internal organs by inserting dangerous objects such as sticks, knitting needles, or broken glass into the vagina or anus.

In developed regions, it is estimated that 30 women die for every 100,000 unsafe abortions. That number rises to 220 deaths per 100,000 unsafe abortions in developing regions and 520 deaths per 100,000 unsafe abortions in sub-Saharan Africa.

Mortality from unsafe abortion disproportionately affects women in Africa. While the continent accounts for 29% of all unsafe abortions, it sees 62% of unsafe abortion-related deaths.

**Who is at risk?**

Any woman with an unwanted pregnancy who cannot access safe abortion is at risk of unsafe abortion. Poor women are more likely to have an unsafe abortion than more affluent women. Deaths and injuries are higher when unsafe abortion is performed later in pregnancy. The rate of unsafe abortions is higher where access to effective contraception and safe abortion is limited or unavailable.

**Complications of unsafe abortion requiring emergency care**

The major life-threatening complications resulting from unsafe abortion are haemorrhage, infection, and injury to the genital tract and internal organs.

**Signs and symptoms**

An accurate initial assessment is essential to ensure appropriate treatment and prompt referral for complications of unsafe abortion. The critical signs and symptoms of complications that require immediate attention include:

- abnormal vaginal bleeding
- abdominal pain
- infection
- shock (collapse of the circulatory system).
Complications of unsafe abortion can be difficult to diagnose. For example, a woman with an extra-uterine or ectopic pregnancy (abnormal development of a fertilized egg outside of the uterus) may have symptoms similar to those of incomplete abortion. It is essential, therefore, for health-care personnel to be prepared to make referrals and arrange transport to a facility where a definitive diagnosis can be made and appropriate care can be delivered quickly.

Treatment and care

- Complications and arising from unsafe abortions and their treatments include:
  - Haemorrhage: timely treatment of heavy blood loss is critical, as delays can be fatal.
  - Infection: treatment with antibiotics along with evacuation of any remaining pregnancy tissue from the uterus as soon as possible.
  - Injury to the genital tract and/or internal organs: if this is suspected, early referral to an appropriate level of health care is essential.

Access to treatment for abortion complications

Health-care providers are obligated to provide life-saving medical care to any woman who suffers abortion-related complications, including treatment of complications from unsafe abortion, regardless of the legal grounds for abortion. However, in some cases, treatment of abortion complications is administered only on the condition that the woman provides information about the person(s) who performed the illegal abortion.

The practice of extracting confessions from women seeking emergency medical care as a result of illegal abortion puts women’s lives at risk. The legal requirement for doctors and other health-care personnel to report cases of women who have undergone abortion, delays care and increases the risks to women’s health and lives. UN human rights standards call on countries to provide immediate and unconditional treatment to anyone seeking emergency medical care.

Prevention and control

Unsafe abortion can be prevented through:

- good sexual education;
- prevention of unintended pregnancy through use of effective contraception, including emergency contraception; and
- provision of safe, legal abortion.

In addition, deaths and disability from unsafe abortion can be reduced through the timely provision of emergency treatment of complications.

Economic impact

In addition to the deaths and disabilities caused by unsafe abortion, there are major social and financial costs to women, families, communities, and health systems. In 2006, it was estimated that $680 million was spent treating serious consequences of unsafe abortion. An additional $370 million would be required to fully meet the unmet need for treatment of complications from unsafe abortion.

WHO response

Evidence-based resources: WHO provides global technical and policy guidance on the use of contraception to prevent unintended pregnancy, safe abortion, and treatment of complications from unsafe abortion. In 2012, WHO published updated technical and policy guidance on safe abortion. WHO recommendations for safe abortion can be found in the following publications:

- Safe abortion: technical and policy guidance for health systems
- Clinical practice handbook for safe abortion
- Safe abortion: technical and policy guidance for health systems (2012)
- Clinical practice handbook for safe abortion (2014)
- Health worker roles in providing safe abortion care and post-abortion contraception (2015).

Technical support to countries

Upon request, WHO provides technical support to countries to adapt sexual and reproductive health policies and programs related to contraception and safe abortion care.

References


4Human Rights Committee; Committee Against Torture; Committee on the Elimination of Discrimination Against Women.
4. BLINDNESS: VISION 2020

Blindness: the global picture

At present, there is an estimated 180 million people worldwide who are visually disabled. Of these, between 40 and 45 million persons are blind and, by definition, cannot walk about unaided. They are usually in need of vocational and/or social support.

The loss of sight causes enormous human suffering for the affected individuals and their families. It also represents a public health, social and economic problem for countries, especially the developing ones, where nine out of 10 of the world’s blind live. In fact, around 60% of them reside in sub-Saharan Africa, China and India.

Approximately 50% of the world’s blind suffer from cataract. The majority of the remaining persons are blind from conditions that include, among others, glaucoma, trachoma, onchocerciasis (also known as river blindness) and different conditions of childhood blindness. Despite a half century of efforts, commencing with organized trachoma control activities, the global burden of blindness is growing largely because of the population growth and ageing.

Approximately 50% of the world’s blind suffer from cataract. The majority of the remaining persons are blind from conditions that include, among others, glaucoma, trachoma, onchocerciasis (also known as river blindness) and different conditions of childhood blindness.

Despite a half century of efforts, commencing with organized trachoma control activities, the global burden of blindness is growing largely because of the population growth and ageing.

If additional resources are not urgently mobilized and efforts are not made to curb this trend, by 2020 the global burden of blindness can double. The developing countries will bear the brunt.

Avoidable Blindness

According to WHO estimates, about 80% of global blindness is avoidable: either it results from the conditions that could have been prevented or controlled if the available knowledge and interventions had been timely applied (e.g., trachoma and river blindness); or it can be successfully treated with the sight restored (e.g., cataract).

Significant progress in the prevention of avoidable blindness has already been made through individual efforts of the international community, including those by the World Health Organization (WHO) and its Member States, other UN agencies, nongovernmental organizations (NGOs) and the private sector.

Given the scope of the problem, the time has come for a major focused and concerted international effort to combat avoidable blindness.

VISION 2020 – the right to sight: A Global Initiative for the Elimination of Avoidable Blindness

In order to make a concerted worldwide effort, WHO and a Task Force of international NGOs have jointly prepared and launched a common agenda for global action: “VISION 2020 -- The Right to Sight”.

VISION 2020 is based on the concept of a broad coalition of all international, nongovernmental and private organizations, which collaborate with WHO in the prevention of blindness and eye care delivery. They share the objective of eliminating avoidable blindness as a public health problem by the year 2020, provided adequate resources are available. These organizations will also jointly work to mitigate the implications of blindness in developmental, social, economic and quality-of-life terms.

The very first step towards VISION 2020 will be a global campaign to raise awareness among peoples and governments about societal implications of blindness, as well as to mobilize a strong, long-term political and professional commitment to eliminate avoidable blindness.
National decision-makers and donor agencies need to be convinced that financial and human resources provided for the elimination of avoidable blindness are a sound, worthwhile investment.

What is new about the Global Initiative?
First, the common objective of eliminating avoidable blindness by 2020 will enable all partners to work in a focused and coordinated manner. The joint advocacy campaign will help raise global awareness about blindness and mobilize additional resources to prevent or treat avoidable blindness.

Second, VISION 2020 will further develop and strengthen the primary health/eye care approach to the problem of avoidable blindness. This will be done on the basis of the invaluable international and national experience already gained through the ongoing national programmes.

Finally, the Initiative will seek broad regional alliances and, eventually, a global partnership for eye health. These partnerships are indispensable to establish worldwide the fundamental human “Right to Sight” and thus save future generations from the tragedy of needless blindness.

Implementation of VISION 2020
VISION 2020 will be implemented through four three subsequent phases of implementation will commence in 2005, 2010 and 2015 respectively. During the ongoing preparatory period, priority is given to the issues of advocacy, regional planning and resource mobilization.

The choice of the countries where VISION 2020 will be implemented is to be regionally prioritized on the basis of the burden of blindness and of available resources.

5. HEPATITIS C
Overview
Hepatitis C virus (HCV) causes both acute and chronic infection. Acute HCV infection is usually asymptomatic, and is only very rarely associated with life-threatening disease. About 15 – 45% of infected persons spontaneously clear the virus within 6 months of infection without any treatment.

The remaining 55 – 85% of persons will develop chronic HCV infection. Of those with chronic HCV infection, the risk of cirrhosis of the liver is between 15 – 30% within 20 years.

KEY FACTS
• Hepatitis C is a liver disease caused by the hepatitis C virus: the virus can cause both acute and chronic hepatitis infection, ranging in severity from a mild illness lasting a few weeks to a serious, lifelong illness.
• The hepatitis C virus is a bloodborne virus and the most common modes of infection are through unsafe injection practices, inadequate sterilization of medical equipment, and the transfusion of unscreened blood and blood products.
• Globally, between 130 – 150 million people globally have chronic hepatitis C infection.
• A significant number of those who are chronically infected will develop liver cirrhosis or liver cancer.
• Approximately 700,000 people die each year from hepatitis C-related liver diseases.
• Antiviral medicines can cure approximately 90% of persons with hepatitis C infection, thereby reducing the risk of death from liver cancer and cirrhosis, but access to diagnosis and treatment is low.
• There is currently no vaccine for hepatitis C; however, research in this area is ongoing.

Geographical distribution
Hepatitis C is found worldwide. The most affected regions are Africa and Central and East Asia. Depending on the country, hepatitis C infection can be concentrated in certain populations (for example, among people who inject drugs) and/or in general populations. There are multiple strains (or genotypes) of the HCV virus and their distribution varies by region.

Transmission
The hepatitis C virus is a bloodborne virus. It is most commonly transmitted through:
• injecting drug use through the sharing of injection equipment;
• the reuse or inadequate sterilization of medical equipment, especially syringes and needles in healthcare settings; and
• the transfusion of unscreened blood and blood products.
HCV can also be transmitted sexually and can be passed from an infected mother to her baby; however these modes of transmission are much less common.

Hepatitis C is not spread through breast milk, food, water or by casual contact such as hugging, kissing and sharing food or drinks with an infected person.

Symptoms
The incubation period for hepatitis C is two weeks to six months. Following initial infection,
approximately 80% of people do not exhibit any symptoms. Those who are acutely symptomatic may exhibit fever, fatigue, decreased appetite, nausea, vomiting, abdominal pain, dark urine, grey-coloured faeces, joint pain and jaundice (yellowing of skin and the whites of the eyes).

**Screening and diagnosis**

Due to the fact that acute HCV infection is usually asymptomatic, few people are diagnosed during the acute phase. In those people who go on to develop chronic HCV infection, the infection is also often undiagnosed because the infection remains asymptomatic until decades after infection when symptoms develop secondary to serious liver damage.

HCV infection is diagnosed in two steps:

- Screening for anti-HCV antibodies with a serological test identifies people who have been infected with the virus.
- If the test is positive for anti-HCV antibodies, a nucleic acid test for HCV ribonucleic acid (RNA) is needed to confirm chronic infection because about 15 – 45% of people infected with HCV spontaneously clear the infection by a strong immune response without the need for treatment. Although no longer infected, they will still test positive for anti-HCV antibodies.

After a person has been diagnosed with chronic hepatitis C infection, they should have an assessment of the degree of liver damage (fibrosis and cirrhosis). This can be done by liver biopsy or through a variety of non-invasive tests.

In addition, these people should have a laboratory test to identify the genotype of the hepatitis C strain. There are six genotypes of the HCV and they respond differently to treatment. Furthermore, it is possible for a person to be infected with more than one genotype. The degree of liver damage and virus genotype are used to guide treatment decisions and management of the disease.

**Getting tested**

Early diagnosis can prevent health problems that may result from infection and prevent transmission of the virus. WHO recommends screening for people who may be at increased risk of infection.

Populations at increased risk of HCV infection include:

- people who inject drugs;
- people who use intranasal drugs;
- recipients of infected blood products or invasive procedures in health-care facilities with inadequate infection control practices;
- children born to mothers infected with HCV;
- people with sexual partners who are HCV-infected;
- people with HIV infection;
- prisoners or previously incarcerated persons; and
- people who have had tattoos or piercings.

**Treatment**

Hepatitis C does not always require treatment as the immune response in some people will clear the infection, and some people with chronic infection do not develop liver damage. When treatment is necessary, the goal of hepatitis C treatment is cure. The cure rate depends on several factors including the strain of the virus and the type of treatment given.

The standard of care for hepatitis C is changing rapidly. Until recently, hepatitis C treatment was based on therapy with interferon and ribavirin, which required weekly injections for 48 weeks, cured approximately half of treated patients, but caused frequent and sometimes life-threatening adverse reactions.

Recently, new antiviral drugs have been developed. These medicines, called direct antiviral agents (DAA) are much more effective, safer and better-tolerated than the older therapies. Therapy with DAAs can cure most persons with HCV infection and treatment is shorter (usually 12 weeks) and safer. Although the production cost of DAAs is low, these medicines remain very expensive in many high- and middle-income countries. Prices have dropped dramatically in some countries (primarily low-income) due to the introduction of generic versions of these medicines.

Much needs to be done to ensure that these advances lead to greater access to treatment globally.

**Prevention**

**Primary prevention:** There is no vaccine for hepatitis C, therefore prevention of HCV infection depends upon reducing the risk of exposure to the virus in health-care settings and in higher risk populations, for example, people who inject drugs, and through sexual contact.

The following list provides a limited example of primary prevention interventions recommended by WHO:

- hand hygiene: including surgical hand preparation, hand washing and use of gloves;
- safe handling and disposal of sharps and waste;
- provision of comprehensive harm-reduction services to people who inject drugs including sterile injecting equipment;
- testing of donated blood for hepatitis B and C (as well as HIV and syphilis);
- training of health personnel; and
- promotion of correct and consistent use of condoms.
Secondary and tertiary prevention: For people infected with the hepatitis C virus, WHO recommends:
• education and counselling on options for care and treatment;
• immunization with the hepatitis A and B vaccines to prevent coinfection from these hepatitis viruses and to protect their liver;
• early and appropriate medical management including antiviral therapy if appropriate; and
• regular monitoring for early diagnosis of chronic liver disease.

Screening, care and treatment of persons with hepatitis C infection
In April 2016, WHO updated its “Guidelines for the screening, care and treatment of persons with chronic hepatitis C”. These guidelines complement existing WHO guidance on the prevention of transmission of bloodborne viruses, including HCV. They are intended for policy-makers, government officials, and others working in low- and middle-income countries who are developing programmes for the screening, care and treatment of people with HCV infection. These guidelines will help expand of treatment services to patients with HCV infection, as they provide key recommendations in these areas and discuss considerations for implementation.

• Guidelines for the screening, care and treatment of persons with chronic hepatitis C

Summary of key recommendations

Recommendations on screening for HCV infection
1. Screening to identify persons with HCV infection
   It is recommended that HCV serology testing be offered to individuals who are part of a population with high HCV prevalence or who have a history of HCV risk exposure/behaviour.
2. When to confirm the diagnosis of chronic HCV infection
   It is suggested that following a positive HCV virus serological test another test (NAT for the detection of HCV RNA) be performed to diagnose chronic infection. NAT for HCV RNA should also be performed to assess whether to start treatment for hepatitis C.

Recommendations on care of people infected with HCV
3. Screening for alcohol use and counselling to reduce moderate and high levels of alcohol intake
   An alcohol intake assessment is recommended for all persons with HCV virus infection followed by the offer of a behavioural alcohol reduction intervention for persons with moderate-to-high alcohol intake.
4. Assessing degree of liver fibrosis and cirrhosis
   In resource-limited settings, the aminotransferase/platelet ratio index (APRI) or FIB4 tests should be used for the assessment of hepatic fibrosis rather than other non-invasive tests that require more resources such as elastography or Fibrotest.

Recommendations on hepatitis C treatment
5. Assessing for HCV treatment
   All adults and children with chronic HCV infection should be assessed for antiviral treatment.
6. Treatment with direct-acting antivirals (DAAs)
   WHO recommends that all patients with hepatitis C be treated with DAA-based regimens, except for a few specific groups of people in whom interferon-based regimens can still be used (as an alternative regimen for patients with genotype 5 or 6 infection and those with genotype 3 HCV infection who also have cirrhosis).
7. Telaprevir and boceprevir should no longer be used
   These two first-generation DAAs, which are administered with pegylated interferon and ribavirin, were recommended in the 2014 guidelines. Evidence now shows that they result in more frequent adverse effects and less frequent cures compared with newer DAA-based regimens. Thus, these 2 medicines are no longer recommended by WHO.
8. WHO recommends preferred and alternative DAA regimens based on genotype and cirrhosis status

WHO response
In May 2016, The World Health Assembly adopted the first “Global Health Sector Strategy on Viral Hepatitis, 2016-2021”. The strategy highlights the critical role of Universal Health Coverage and the targets of the strategy are aligned with those of the Sustainable Development Goals. WHO also organizes World Hepatitis Day on 28 July every year to increase awareness and understanding of viral hepatitis.

References
• Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010
6. TRACHOMA

Overview
Trachoma is the leading infectious cause of blindness worldwide. It is caused by an obligate intracellular bacterium called Chlamydia trachomatis. The infection is transmitted through contact with eye and nose discharge of infected people, particularly young children who harbour the principal reservoir of infection. It is also spread by flies which have been in contact with the eyes and noses of infected people.

KEY FACTS
- Trachoma is a disease of the eye caused by infection with the bacterium Chlamydia trachomatis.
- It is known to be a public health problem in 42 countries, and is responsible for the blindness or visual impairment of about 1.9 million people. Just over 200 million people live in trachoma endemic areas and are at risk of trachoma blindness.
- Blindness from trachoma is irreversible.
- Infection spreads through personal contact (via hands, clothes or bedding) and by flies that have been in contact with discharge from the eyes or nose of an infected person. With repeated episodes of infection over many years, the eyelashes may be drawn in so that they rub on the surface of the eye, with pain and discomfort and permanent damage to the cornea.
- Resolution WHA51.11 adopted by the World Health Assembly in 1998 targets the global elimination of trachoma as a public health problem by 2020.
- The elimination strategy is encapsulated by the acronym “SAFE”: Surgery for advanced disease, Antibiotics to clear C. trachomatis infection, and Facial cleanliness and Environmental improvement to reduce transmission.
- In 2015, more than 185,000 people received surgical treatment for advanced disease, and 56 million people were treated with antibiotics for trachoma.

Clinical characteristics and morbidity
In areas where trachoma is endemic, active (inflammatory) trachoma is common among preschool-aged children, with prevalence rates which can be as high as 60 – 90%. Infection becomes less frequent and shorter in duration with increasing age. Infection is usually acquired when living in close proximity to others with active disease, and the family is the main setting for transmission. An individual’s immune system can clear a single episode of infection, but in endemic communities, re-acquisition of the organism occurs frequently.

After years of repeated infection, the inside of the eyelid can become so severely scarred (trachomatous conjunctival scarring) that it turns inwards and causes the eyelashes to rub against the eyeball (trachomatous trichiasis), resulting in constant pain and light intolerance; this and other alterations of the eye can lead to scarring of the cornea. Left untreated, this condition leads to the formation of irreversible opacities, with resulting visual impairment or blindness. The age at which this occurs depends on several factors including local transmission intensity. In very highly endemic communities, it can occur in childhood, though onset of visual impairment between the ages of 30 and 40 years is more typical.

Visual impairment or blindness results in a worsening of the life experience of affected individuals and their families, who are normally already amongst the poorest of the poor. Women are blinded up to four times as often as men, probably due to their close contact with infected children and the resulting greater frequency of infection episodes.

Environmental risk factors influencing the transmission of the disease include:
- poor hygiene
- crowded households
- water shortage
- inadequate latrines and sanitation facilities.

Distribution
Trachoma is hyperendemic in many of the poorest and most rural areas of 42 countries of Africa, Central and South America, Asia, Australia and the Middle East.

It is responsible for the blindness or visual impairment of about 1.9 million people. It causes about 1.4% of the global total of blind individuals.

Overall, Africa remains the most affected continent, and the one with the most intensive control efforts. In 2015, in the 29 countries of WHO’s Africa Region in which trachoma is known to be a public health problem, nearly 176,000 people with trichiasis were given operations (95% of the global total operated), and more than 54 million people were treated with antibiotics (97% of the global total treated) for trachoma.

As of 1st March 2016, seven countries had reported achieving elimination goals, which signifies a major milestone in the campaign to eliminate trachoma. These countries are: China, Gambia, Ghana, the Islamic Republic of Iran, Morocco, Myanmar and Oman. In November 2012, Oman was acknowledged by WHO to have eliminated trachoma.
Economic impact
The burden of trachoma on affected individuals and communities is enormous. The economic cost in terms of lost productivity from blindness and visual impairment is estimated at between US$ 2.9 billion and US$ 5.3 billion annually, increasing to US $8 billion when trichiasis is included.

Prevention and control
Elimination programmes in endemic countries are being implemented using the WHO-recommended SAFE strategy. This consists of:

- Surgery to treat the blinding stage of the disease (trachomatous trichiasis);
- Antibiotics to clear infection, particularly mass drug administration of the antibiotic azithromycin, which is donated by the manufacturer to elimination programmes, through the International Trachoma Initiative;
- Facial cleanliness; and
- Environmental improvement, particularly improving access to water and sanitation.

Most endemic countries have agreed to accelerate the implementation of this strategy to achieve their respective elimination targets, all by the year 2020.

Data reported to WHO by Member States for 2015 show that more than 185,000 people with trachomatous trichiasis were provided with corrective surgery in that year, and 56 million people in endemic communities were treated with antibiotics to eliminate trachoma.

Elimination efforts need to continue to satisfy the target set by World Health Assembly resolution WHA 51.11, which is elimination of trachoma as a public health problem by 2020. Particularly important will be the full engagement of other sectors involved in water, sanitation and socioeconomic development.

WHO response
WHO adopted the SAFE strategy in 1993. Its mandate is to provide technical leadership and coordination to international efforts aiming to eliminate trachoma as a public health problem.

In 1996, WHO launched the Alliance for the Global Elimination of Trachoma by 2020 (GET2020). GET2020 is a partnership which supports implementation of the SAFE strategy by Member States, and the strengthening of national capacity through epidemiological surveys, monitoring, surveillance, project evaluation, and resource mobilization.

From 2012 to 2015, WHO helped to lead the Global Trachoma Mapping Project, which provided baseline survey data for 1546 suspected endemic districts in 29 countries, facilitating the launch of interventions where they are required. In July 2016, WHO, the International Trachoma Initiative, RTI International, and Sightsavers launched Tropical Data, a WHO-led epidemiological survey support service to assist national neglected tropical disease programmes.

Elimination of trachoma as a public health problem is defined as: (i) a prevalence of trachomatous trichiasis “unknown to the health system” of less than one case per 1000 total population; and (ii) a prevalence of trachomatous inflammation-follicular in children aged between 1 – 9 years of less than 5%, in each formerly endemic district.