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Low Carbohydrate Ketogenic Diet Enhances Cardiac Tolerance to Global Ischaemia

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The cardio-protective effects of a low carbohydrate ketogenic diet following global ischaemic injury as compared to rats fed a normal and high carbohydrate diet for a period of 19 weeks, were investigated. The reperfusion recovery of coronary flow was highly significant in the low carbohydrate ketogenic diet group. Although the initial reperfusion recovery of the pressure developed in the left ventricle, P_{max} was similar in all groups, after 15 minutes, the momentum for faster recovery was maintained in the low carbohydrate ketogenic diet group. Ultrastructural observations of the cardiac muscles have shown that there was a decrease in the number of mitochondria in rats fed a high carbohydrate diet and an increase in the number of mitochondria in those fed a low carbohydrate ketogenic diet as compared to the normal diet group. This study demonstrates that a low carbohydrate ketogenic diet is cardio-protective functionally.

Introduction: Ischaemia and reperfusion lead to cell death. These pathways are regulated and hence are subjected to therapeutic intervention. Previously, we have shown that a low carbohydrate ketogenic diet (LCKD) reduces the risk factors for heart disease in obese patients. This study is aimed at understanding the cardio-protective effects of LCKD following global ischaemic injury in rats.

Materials and Methods: Rats weighing 190-250 g were divided into normal diet (ND), LCKD and high carbohydrate diet (HCD) groups consisting of six animals in each group. Specific diets were given to each group for a period of 19 weeks. Changes in body weight, ultrastructure of the cardiac muscles and the cardio-protective effects of the LCKD group as compared to the ND and HCD groups were investigated in rats following global ischaemic injury.

Results: Electron microscopic studies have shown that there was a decrease in the number of mitochondria in rats fed a high carbohydrate diet and an increase in the number of mitochondria in those fed a low carbohydrate ketogenic diet as compared to the normal diet group. Rats on LCKD had a remarkable tolerance to ischaemia and a faster recovery of cardiac function following reperfusion. The initial reperfusion recovery of the pressure developed in the left ventricle, P_{max} was similar in all groups. However, after 15 minutes, the momentum for faster recovery was significantly maintained in the LCKD group ($P < 0.05$). The reperfusion recovery of coronary flow was highly significant ($P < 0.05$) in the LCKD regime. The increase in left ventricle end diastolic pressure, coronary vascular resistance and the changes in body weight were not significant between the experimental groups.

Discussion and Conclusion: This is a unique study showing ultrastructural variation in cardiac muscle in relation to cardio-protective function in rats fed a low carbohydrate ketogenic diet. This study suggests that the LCKD is cardio-protective functionally. The underlying mechanism of the cardio-protective effect of an LCKD needs to be elucidated.

Discrepancy in Antimicrobial Susceptibility Test Results Obtained for Oral Streptococci with the Etest and Agar Dilution

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A total of 270 viridans group streptococci (VS) isolated from healthy children, identified to the species level, were tested for their susceptibilities to penicillin, imipenem, erythromycin, and vancomycin. A total of 270 isolates and 1,080 organism-antibiotic combinations were evaluated. The overall susceptibility rates of all isolates obtained by the Etest (ET) versus agar dilution (AD) were 60.4% versus 61.8% for penicillin, 63.8% versus 63.9% for erythromycin, 90.6% versus 96% for vancomycin, and 99.1% versus 96.0% for imipenem, respectively. Major discrepancies occurred in the testing of the susceptibility of *Streptococcus mutans* to vancomycin, with 59.5% (ET) versus 100% (AD), followed by *S. salivarius*, with 84.1% versus 100%; *S. oralis*, with 82.1% versus 96.4%; and *S. mitis*, with 90% versus 100%, respectively. There were also differences in the rates of susceptibility of *S. mutans*, 66.5% (ET) versus 85.1% (AD), and *S. intermedius*, 82.9% versus 72.1%, respectively, to penicillin. General agreement between the results of ET and AD was obtained for 973 organism-antibiotic combinations out of 1,080 antibiotic combinations, i.e., 90.1%. Very major errors were found for 6.8% of isolates, and major errors were found for 3.2% of isolates; the minor errors were negligible. Agreement between the results of the two methods was 98.7% for penicillin, 94.6% for vancomycin, 96.9% for imipenem, and 99.9% for erythromycin. The highest rate of very major errors was for vancomycin, at 5.4%. The ET appears to be as efficient as AD for susceptibility testing of VS, except for vancomycin, where very major errors in the results were relatively high.

Butyrylcholinesterase Activity and Lymphocyte Subpopulations in Peripheral Blood of Kuwaiti Women Experiencing Recurrent Spontaneous Abortion

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This study has evaluated the hypothesis that activity of the detoxifying enzyme butyrylcholinesterase (BuChE) correlates with levels of serum anti-cardiolipin antibodies (ACA) and T lymphocytes in peripheral blood of women experiencing recurrent spontaneous abortion (RSA). Peripheral venous blood from 16 non-pregnant, RSA-afflicted women and 8 healthy non-pregnant women was analyzed for frequency of T lymphocyte subpopulations by two-color flow cytometry and for serum BuChE using butyrylthiocholine iodide/spectrophotometry. RSA-afflicted women with high serum ACA, but not those with normal ACA levels, exhibited significantly increased percentages of CD4+CD25+ cells ($p < 0.01$) and CD4+HLA-DR+ cells ($p < 0.05$) relative to healthy women. CD4+CD25+(high) cells were significantly lower ($p < 0.05$), while CD4+CD25+(low) cells were significantly higher ($p < 0.01$), in women with elevated ACA compared to healthy women and to RSA women with normal ACA. Relative to healthy, non-pregnant subjects, serum BuChE activity in RSA patients was elevated, both for those with normal ACA ($p < 0.001$) and elevated ACA levels ($p < 0.01$). Among healthy controls, a significant positive correlation was observed between frequency of CD3+NK cells and BuChE activity ($p < 0.01$), but not for RSA-afflicted subjects. A positive correlation between BuChE activity and frequency of CD4+CD25+ cells, as well as CD4+CD25+(high) cells, was observed in the RSA-afflicted subject group with elevated ACA ($p < 0.05$), which may be related to induction of BuChE by toxic metabolites resulting from pathogenic T cell activity. It is concluded that, among RSA patients, high serum ACA correlates with elevated levels of activated T cells and reduced CD4+CD25+(high)/CD4+CD25+(low) cells in comparison to healthy women or those afflicted with RSA but with normal ACA. BuChE activity is observed to be elevated in RSA patients irrespective of serum ACA status.

Factors Associated with Quality of Life of Outpatients with Breast Cancer and Gynecologic Cancers and Their Family Caregivers: A Controlled Study

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ABSTRACT

Background: Quality of life (QOL) issues are of interest in cancer because effective methods of treatment and detection have led to an increase in the number of long-term survivors. The objectives of the study were: to assess the subjective QOL of stable Sudanese women cancer outpatients and their family caregivers, using the WHO 26-item QOL Instrument; compare with matched general population groups, as well as diabetic and psychiatric patient groups; examine patient-caregiver concordance in ratings; and assess the variables associated with their QOL, with a view to identifying factors that can enhance quality of care.

Methods: Responses of oncology outpatients with breast cancer (117), cervical cancer (46) and ovarian cancer (18) (aged 44.6, SD 11.5) were compared with those of their family caregivers and matched general population groups. Data were analyzed by univariate and multivariate statistics.

Results: The cancer groups had similar QOL domain scores, which were significantly lower than those of their caregivers, but higher than the control group as well as those of psychiatric and diabetic patients studied previously. Patients who were married, with higher education, better employment, and with longer duration of illness had higher QOL. Patients on radiotherapy and their caregivers had higher QOL scores. Correlations between patient's ratings and caregiver impression of patient's QOL were high. Caregiver impression was a significant predictor of patient's and caregiver's QOL. Other predictors for the patient were: currently feeling sick and duration of illness; for the caregiver: feeling sick, relationship to patient, and age.

Conclusion: Cancer patients in stable condition and with psychosocial support can hope to enjoy good QOL with treatment. The findings constitute an evidence base for the country's cancer care program, to boost national health education about prognosis in cancer. Families living with women cancer patients are vulnerable and need support if the patient is recently diagnosed, less educated, single, not formally employed; and the caregiver is female, parent, younger, less educated, unemployed and feels sick. Clinicians need to invest in the education and support of family caregivers. The patient-caregiver dyad should be regarded as a unit for treatment in cancer care.

Beneficial Effects of Ketogenic Diet in Obese Diabetic Subjects

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Objective: Obesity is closely linked to the incidence of type II diabetes. It is found that effective management of body weight and changes to nutritional habits especially with regard to the carbohydrate content and glycemic index of the diet have beneficial effects in obese subjects with glucose intolerance. Previously we have shown that ketogenic diet is quite effective in reducing body weight. Furthermore, it favorably alters the cardiac risk factors even in hyperlipidemic obese subjects. In this study the effect of ketogenic diet in obese subjects with high blood glucose level is compared to those with normal blood glucose level for a period of 56 weeks.

Materials and Methods: A total of 64 healthy obese subjects with body mass index (BMI) greater than 30, having high blood glucose level and those subjects with normal blood glucose level were selected in this study. The body weight, body mass index, blood glucose level, total cholesterol, LDL-cholesterol, HDL-cholesterol, triglycerides, urea and creatinine were determined before and at 8, 16, 24, 48, and 56 weeks after the administration of the ketogenic diet.

Results: The body weight, body mass index, the level of blood glucose, total cholesterol, LDL-cholesterol, triglycerides, and urea showed a significant decrease from week 1 to week 56 ($P < 0.0001$), whereas the level of HDL-cholesterol increased significantly ($P < 0.0001$). Interestingly these changes were more significant in subjects with high blood glucose level as compared to those with normal blood glucose level. The changes in the level of creatinine were not statistically significant.

Conclusion: This study shows the beneficial effects of ketogenic diet in obese diabetic subjects following its long-term administration. Furthermore, it demonstrates that in addition to its therapeutic value, low carbohydrate diet is safe to use for a longer period of time in obese diabetic subjects.

Increasing Severity of Haematuria with Successive Pregnancies in a Woman with Renal Angiomyolipoma

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Objective: To report a case of a 31-year-old woman with renal angiomyolipoma (RAML) who presented with progressive massive haematuria with successive pregnancies.

Clinical Presentation: A 28-year-old woman presented with mild haematuria in the third trimester of her second pregnancy. This was due to bleeding from a left RAML. Patient became pregnant for a third time. The RAML increased in size and patient bled more during the third trimester. After delivery she refused partial nephrectomy or renal embolisation. In the third trimester of the fourth pregnancy, she presented with massive haematuria, shock, severe anaemia (haemoglobin of 6gm/l) and required a total of 26 units of blood transfusion during a 4-week period. She required emergency Caesarian section at 36 weeks and simple nephrectomy 3 months postpartum.

Conclusion: The risk of profuse haemorrhage from RAML may increase with successive pregnancies in women with RAML. This anomaly should be treated in between pregnancies by either angioembolisation or resectional surgery.

Different Responses to Angiotensin-(1-7) in Young, Aged and Diabetic Rabbit Corpus Cavernosum

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We evaluated the ability of angiotensin-(1-7) [Ang-(1-7)] to produce relaxation of the corpus cavernosum of New Zealand White rabbits. The reactivity of corpus cavernosal strips isolated from young rabbits (8-10 months old) was assessed in organ-bath chambers. Cumulative concentration response curves for Ang-(1-7), angiotensin II (Ang II), carbachol and sodium nitroprusside (SNP) were established. Ang-(1-7) ($10(-12)$ to $10(-5)$ M) produced a concentration-dependent relaxation of the corpus cavernosal strips with a $pD(2)$ value of 9.8 ± 0.3 . Ang-(1-7)-induced maximal relaxant response was reduced by $48 \pm 2\%$, $57 \pm 3\%$ and $76 \pm 2\%$ in the presence of A-779 ($10(-6)$ M), a selective Ang-(1-7) receptor (AT(1-7)) antagonist, nitro-L-arginine methyl ester (L-NAME) ($10(-4)$ M),

an inhibitor of nitric oxide (NO) synthase, or iberiotoxin (5×10^{-8} M), an inhibitor of calcium-activated potassium (BK) channels, respectively. In contrast, Ang II-induced contraction was increased in the presence of A-779. Carbachol-, SNP- and Ang-(1-7)-induced relaxations were significantly reduced whereas Ang-II induced contraction was significantly increased in the cavernosum strips from older (18-24 months old) and diabetic rabbits compared to the young. Pre-incubation of the cavernosum strips obtained from young, older or diabetic rabbits with Ang-(1-7) resulted in a significant attenuation of Ang II-induced contraction. In conclusion, these results demonstrate that Ang-(1-7) can produce nitric oxide-dependent relaxation of the corpus cavernosum through activation of AT(1-7) and BK channels. Older and diabetic animals showed impaired Ang-(1-7)-mediated relaxation suggesting that aging and diabetes related erectile dysfunction (ED) may be partly due to decreased Ang-(1-7)-mediated relaxation of the corpus cavernosum. Acute pre-incubation with Ang-(1-7) was effective in attenuating Ang II-induced contraction of rabbit corpus cavernosum suggesting that the possible role of Ang-(1-7) in treatment of ED should be investigated.

Relationship of Depression, Disability, and Family Caregiver Attitudes to the Quality of Life of Kuwaiti Persons with Multiple Sclerosis: A Controlled Study

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Background: Assessment of subjective quality of life (QOL) of persons with multiple sclerosis (MS) could facilitate the detection of psychosocial aspects of disease that may otherwise go unrecognized. The objectives of the study were to (i) compare the QOL ratings of relapsing remitting (RRMS) and progressive (PMS) types of MS with those of a general population group and the impression of their family caregivers; and (ii) assess the association of demographic, clinical, treatment, depression, and caregiver variables with patients' QOL.

Methods: Consecutive clinic attendees at the national neurology hospital were assessed with the 26-item WHOQOL Instrument, Beck's Depression Inventory and Expanded Disability Scale. Caregivers rated their impression of patients' QOL and attitudes to patients' illness.

Results: The 170 patients (60 m, 109 f) consisted of 145 (85.3%) with RRMS and 25 with PMS, aged 32.4 (SD 8.8), age at onset 27.1 (7.7), EDSS score 2.9 (1.8), and 76% were employed. The patients were predominantly dissatisfied with their life circumstances. The RRMS group had higher QOL domain scores ($P < 0.001$), and lower depression ($P > 0.05$) and disability ($P < 0.0001$) scores than the PMS group. Patients had significantly lower QOL scores than the control group ($P < 0.001$). Caregiver impression was significantly correlated with patients' ratings. Depression was the commonest significant covariate of QOL domains. When we controlled for depression and disability scores, differences between the two MS groups became significant for only one (out of 6) QOL domains. Patients who were younger, better educated, employed, felt less sick and with lesser side effects, had higher QOL. The predictors of patients' overall QOL were disability score, caregiver impression of patients' QOL, and caregiver fear of having MS.

Conclusion: Our data indicate that MS patients in stable condition and with social support can hope to have better QOL, if clinicians pay attention to depression, disability, the impact of side effects of treatment and family caregiver anxieties about the illness. The findings call for a regular program of psychosocial intervention in the clinical setting, to address these issues and provide caregiver education and supports, in order to enhance the quality of care.