

Letter to the Editor

Pathology in the New Century

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Dear Sir

The 20th century was the century of advancements and inventions. Advances in computer technology and communication have put information at our fingertips. Like a hurricane, computers and the Internet have seeped into every nook and corner of medicine. Their role in laboratory medicine has been especially drastic, ranging from web-based record and electronic report dispatching systems to handling and manipulating microscopic electronic images for pathology reports, personal collection, research purpose and publications, and even for teaching and educational purposes. These inventions have revolutionized the way we think, the way we work, and the way we interact. Technological advancement has necessitated updating the knowledge and skills of professionals engaged in the service industry. Pathology and Pathologists form the bedrock of modern medicine and play a very important role in the overall management of a patient. This includes intervention to obtain a sample, proper processing of this sample, reading of the result, writing a meaningful report, communicating to the patient and treating physician, treatment and monitoring response to treatment. To this, one can add public and physician awareness by organizing courses, declaring data on diseases and participating in surveillance programs.

Pathologists in the new millennium will have a very important role to play in achieving a most important aspect that needs our attention: the proper training of future pathologists, guidelines for the maintenance and assessment of professional performance, and commitment to a life long learning process such as continuous professional development. These are the basic ingredients for making a competent pathologist. We have to provide an environment to achieve these targets by organizing courses, conferences, clinicopathologic meetings and telepathology sessions.

Advances in Molecular Biology are blurring the separation between Histopathology, Hematology, Microbiology and Clinical Pathology. The advent of nucleic acid based diagnostic methods such as polymerase chain reaction (PCR) are increasingly being utilized for the detection of microorganisms such as hepatitis B and C virus, mycobacterium tuberculosis, Chlamydia trachomatis etc^[1]. The source of an outbreak can be traced by DNA typing of microorganism.

Recombinant DNA technology is being utilized for genetic diagnosis. For example, chorionic villous biopsy can be used to prenatally diagnose disorders like b-thalassemia, cystic fibrosis or Duchenne muscular dystrophy. Along with immunohistochemistry, gene rearrangement studies are being utilized to study clonality in lymphoproliferative disorders^[2]. Molecular technology can examine the HLA alleles at a much higher resolution than serologic techniques. Use of this technology has surely opened several new avenues for the practicing pathologists. Interphase cytogenetic techniques which analyze chromosomes in non-dividing cells such as Fluorescent in situ hybridization (FISH) are proving to be highly successful techniques for diagnosing congenital abnormalities and evaluation of neoplastic diseases etc^[3]. There is an ever-growing list of chromosome specific DNA probes. The filter hybridization techniques are suited for the analysis of generic alteration such as gene amplifications, deletions and point mutations^[4]. In situ hybridization techniques are being used to localize oncogenic expression such as WTI in Wilm's tumor. All this technology needs investment in hardware and manpower training.

Information strategy for modern pathology services will have a major role in deriving a change with new inventions of the eye-popping technology and digital wonders for pathology like digital filmless cameras, image database, web servers and

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even more. Digital imaging and technology is no longer a fiction story for pathologists. Internet based telepathology consultations and screening of "Digital slides", from in between hospitals and between different continents of the world is now possible. The microscope images of histopathology and hematology can now be saved through simple digital cameras and sent or received via Email and Internet for further opinions, consultations, discussions, teaching and even for patient education. The Royal College of Pathologists in the UK has published a report on a core training program in pathology information^[5]. It says the current knowledge among pathologists may be sufficient to practice diagnostic pathology but may be insufficient to direct information technology. All pathologists should have knowledge of basic modular hardware architecture of personal computers. In addition, histopathologists should know digital still and video image generation, as well as storage and transmission. Microbiologists should know remote order entry methods, automated laboratory order entry, computer alerting of significant findings, and epidemiology and surveillance. Chemical pathologists should know automated laboratory order entry, minimal requesting, use of computer interface, alerting of abnormal results, data extraction etc. Hematologists should know computer interfaces, computerized alerting of abnormal results, data extraction and access to evidence based or validated information.

Pathologists in the new millennium are not going to sit in a corner of a pathology laboratory isolated from the rest of the community looking down the microscope onto a piece of tissue on a slide. He/she is going to be a dynamic individual, interacting with the community, physicians, epidemiologists etc. As a chemical pathologist, he/she is going to run lipid, diabetic and endocrine clinics. As a hematologist along with treating and

diagnosing thalassemia, he/she will work on gene therapy and bone marrow transplantation. As a microbiologist, he/she may be found working on mutations in microorganism responsible for treatment resistant and as histopathologist, along with various interventions, he/she may be working on genetic alteration in malignant tumors and metastasis.

It is in the interest of pathologists to adopt change, as rapidly as possible, otherwise pathology will be rapidly taken over by other specialties and will risk losing its identity. Many medical schools are switching problem based learning, further threatening the role of the pathologists in the field of medical education. It is up to us to evolve strategies for scholarly activities to maintain our unique position as pathologists rather than submerging in the sea of clinicians and basic scientists.

REFERENCES

1. Tariq M, Shapper M, Shahid S et al. Detection of mycobacterium tuberculosis in paraffin embedded intestinal tissue specimen by polymerase chain reaction: Characterization of IS 6110 element negative strains. *J Pak Med Assoc* 1998; 48:174-178.
2. Samina N, Irshad NS, Shahid P et al. Heterogeneity in EBV genome isolated from patient with peripheral T-cell Non-Hodgkin's lymphoma predominately by TCR gene rearrangement, Karachi. 6th Asia Pacific Congress and 23rd PAPA Annual Conference, November 25-28, 1999.
3. Lee W, Han K, Harris CP et al. Use of FISH to detect chromosomal translocations and deletions. Analysis of chromosome rearrangements in synovial sarcoma cells from paraffin embedded specimens. *Am J Pathol* 1993; 143:15-19.
4. Sreekantaiah C, Ladanyi M, Rodriguez E et al. Chromosomal aberrations in soft tissue tumours. Relevance to diagnosis, classification and molecular mechanisms. *Am J Pathol* 1994; 144:1121-1134.
5. Jonathan K. Core training programme in pathology informatics. The bulletin of the Royal College of Pathologists issue 108, September, 1999.