## Presidential address: Annual academic sessions 2012

### The past, present and the future of histopathology practice in Sri Lanka

*M J Fernando*

A medical system based essentially on ayurveda has been a part of our history and heritage. As a result of archeological excavations by eminent oriental and western archeologists we have evidence of a highly organized hospital services in this country. In the 5th century, during the Anuradhapura era, the hospitals and medical centers were organized and administered by ayurvedic physicians and surgeons, who used special medical techniques such as herbal medicinal baths to cure different illnesses. The herbal medicines they used have been documented extensively on ola leaves and these are now used as reference material in ayurvedic practice.

The inception of formal western medical teaching in Sri Lanka was 140 years ago, in the British colonial times when the governor, Sir Hercules Robinson formally declared open the Colombo Medical School in June 1870 and Dr. James Loos became its first principal. Dr. James Loos recognized the importance of pathology in the practice of medicine, especially in the diagnosis of diseases. He introduced the subject of pathology to the medical school curriculum and taught the subject himself.

The other pioneer who was responsible for the teaching of pathology at that time in the Colombo medical school was Sir Aldo Castellani who was the first professor of pathology during the period of 1903 to 1915. The first Sri Lankan professor of pathology, Prof. W.A. E. Karunarathne, was responsible for the coordination of pathology services between the laboratory and the hospital. He organized the best pathological museum in East Asia, recording a land mark achievement for a Sri Lankan. In 1954, Dr. G H Cooray succeeded him as the Professor and head of the department and continued to serve the department until his death in 1970. The contributions made by Professors W.A.E Karunarathne and G.H. Cooray are outstanding in the field of pathology in Sri Lanka. They were excellent teachers, keen researchers and excellent histopathologists. Generations of medical undergraduates and young pathologists have benefited immensely from their guidance.

Nearly a century after the establishment of the first medical school, the second medical school was inaugurated in Peradeniya in 1961. Professor G.E. Tennakoon became the first professor of pathology in the Peradeniya Medical School and on his retirement in 1981, Professor R.G. Panabokke succeeded him. Medical schools in Jaffna and Galle were established in the late 1970s and the first professors of pathology of these medical schools were Professor C. Balasubramanium and Professor D.J.P. Perera respectively. The Sri Jayawardenepura and the Kelaniya Medical Faculties were established in the 1980s. The Eastern and the Rajarata Medical Faculties established subsequently followed bringing the total to 8 medical faculties in the country.

Prof Karunarathne was succeeded by Dr. G.S.W. De Saram in 1940 as the head of Pathology at the General hospital Colombo. Dr. W.D. Ratnawale was appointed as the pathologist at the General Hospital Colombo in 1954 and was succeeded by Dr. Doris Peiris in 1964. Dr. Peiris held the post of Pathologist until her retirement in 1983. Their careers were impressive. Rapid development in the spheres of chemical pathology and bacteriology took place in the late 1970s when Dr. A.B.V. Perera and Dr. Meena Mahendran were appointed in charge of the two fields respectively. Laboratory services improved vastly and pathology branched off into haematology, chemical pathology, microbiology and histopathology under their guidance.

In 1983, Dr H R Wicramasinghe and in 1984 Dr Chitrika De Silva were appointed to the General Hospital Colombo. Pathologists were appointed to provincial hospitals of Kandy and Galle, the children's hospital, the De Soysa Maternity Hospital and Eye hospital in Colombo. In 1965 Dr. Bede Jayaweera was appointed to the Cancer Institute Maharagama.

In the early 70s, island wide pathology services were extended to the provincial hospitals as well as some base hospitals. These centers were manned by recently trained and qualified pathologists. During this period, most pathologists realized the urgent need to organize themselves into a representative body, resulting in the formation of the College of Pathologists of Sri Lanka in March 1975. The inaugural meeting of the College was held on 15 May 1975 in the consultants' lounge of the General Hospital Colombo. Eighteen pathologists were present. The first president of the College was Dr. W D Rathnawale.

In 1974, the government decided that postgraduate medical education should be organized locally and the Post Graduate Institute of Medicine (PGIM) was established in 1974, attached to the University of Colombo. The objective of the Post Graduate Institute of Medicine is the training of a doctor to a level of competence in his or her chosen discipline which would enable them to undertake health care responsibilities at consultant level. A board of study in pathology was established with representatives from the College of Pathologists and from the faculties of medicine from the universities of Colombo, Peradeniya, Jaffna and Ruhuna for the purpose of organizing the training programme. The first chairperson was Professor Daphne Attygalle, Professor of Pathology of the Faculty of Medicine, University of Colombo and Dr. H R Wickramasinghe was the first secretary of the board.

The Pathology curriculum remained unchanged for 20 years. Considering the new developments in the field of pathology and assessing the requirements of the country, the board of study in pathology unanimously decided to change the curriculum, and in the year 2008 a new curriculum was introduced. Entry criteria for the different fields of pathology were changed and all the candidates had to undergo the same basic sciences course and basic laboratory training for 6 months. They were then required to undergo further training in their respective fields for 4 years to obtain a MD in Histopathology, Chemical Pathology or Clinical Haematology.

According to PGIM statistics, 86 histopathologists have been board certified upto April 2012. Out of these 86 pathologists, 54 are in the Ministry of health and 19 are serving in the universities. There are 8 acting pathologists who have returned after their overseas training and are working in the peripheral hospitals. 35 doctors are currently in the programme at different stages of training.

## Work process

In the beginning, all the laboratory procedures were done using manual methods and only routine haematoxylin and eosin stains were used. Gradually, special histochemical stains were developed. Electron microscopy played an important role in diagnostic pathology in the fields of renal and tumour pathology. At present the role of diagnostic electron microscopy has diminished considerably as a result of the advent of immunohistochemistry and other techniques.

Immunohistochemistry is the application of immunological principles and techniques to demonstrate the molecules in the cells and tissues. This was started in the mid 90s in our country and the pioneer work was done at the University of Peradeniya and the Cancer Institute Maharagama. The immunohistochemistry laboratory established in the National Hospital now provides island wide services. General Hospital Kandy too started immunohistochemistry last year. We are hoping to establish new laboratories in Galle and in the Northern part of the country to expedite diagnosis and increase diagnostic capacity.

Flow cytometry is another important technique developed in the recent past in our country; it is available at Cancer Institute Maharagama and several private hospitals. The main limitation of flow cytometry in histopathology is that cells need to be in a single cell suspension in order to carry out the analysis. This requirement is easily achieved in blood and other fluids. Therefore, flow cytometry analysis in leukaemia and lymphoma has become a routine practice.

Advances made in molecular biology are having a major impact on the practice of surgical pathology. All the major molecular methods depend on hybridization techniques based on the application of recombinant DNA technology. In situ hybridization (ISH) techniques have been used to detect gene expression by neoplasms. Fluorescent in situ hybridization has been particularly useful because of its greater sensitivity and rapidity. However, a fluorescence microscopy set up is expensive and correlation with morphology is often difficult. Chromogenic ISH (CISH) and Silver ISH (SISH) are alternative methods and these permit better correlation of positive signals with morphology. This facility is unfortunately not available in Sri Lanka at present.

## Future goals for histopathology in Sri Lanka

### Upgrading the infra-structure of laboratories

This depends on space, manpower, equipment and technical knowledge. In Sri Lanka very few hospitals have spacious laboratories, most being very compact. Histopathology laboratories should be provided with technically improved tissue processors which can process the tissue quickly with less time intervals and automated slide stainers which can handle hundreds of slides at a time. Special centers should be provided with frozen microtomes, automated cytocentrifuges, camera systems to get microscopic and macroscopic photographs and computer systems to link the histopathology laboratory with the wards and the theatres.

### Human resources

Different levels of skilled personnel are required in a laboratory. They consist of qualified medical laboratory technologists (MLT), data entry operators and minor staff. The ministry should consider the number of biopsies, the type of biopsies, number of special histochemical stains and the number of cytology specimens each laboratory handles when allocating MLTs to a particular hospital.

MLTs should be trained in specialized centers abroad or experts should be invited from other countries to share their knowledge. The technicians need short training programs to enable them to learn how to set up new tests and gain knowledge on information technology (IT). These skills should also be added to their teaching curriculum.

### Introducing new tests

Malignancies are increasing in number according to the statistics of the cancer control programme in our country. Establishing new tests like FISH, CISH, and SISH are important because most of the centers in the world use molecular targeted therapy for treatment of colorectal, lung and breast carcinomas, GIST and some lymphomas. For instance, in the treatment of lung adenocarcinoma EGFR mutation testing is important. This can be performed with FISH or CISH techniques. EGFR positive patients will respond better to the drug Giethinum. It is important to establish these tests at least in one center like Cancer Institute Maharagama.

### Referral centres

It is important to establish large referral centers in all the provinces and appoint several pathologists enabling them to subspecialize in different fields of pathology.

### Clustering of small laboratories

Clustering of small centers like base hospitals and district hospitals will enable sharing of equipment, technologists and histopathology services.

## Establishing IT units in major hospitals

IT units should be established in all the major hospitals to store microphotography images and maintain data bases of all cases so that retrieval of data will become much easier.

## Improving the histopathology report format

Macroscopy and microscopy images of the specimens should be included in the final report as is done in radiology practice.

## Upgrading the postmortem rooms

The post mortem rooms need to be upgraded to the standard of a modern theatre. Facilities should be provided, so that the whole procedure may be viewed by interested clinical fellows and medical students.

## Accreditation

In developed countries, all laboratory results are validated before issue. Although the process of accreditation is tedious, time consuming and expensive, the newly established Sri Lanka Accreditation Board (SLAB) has offered to assist us in this regard. I am sure we can achieve accreditation for all our government sector laboratories in the near future as the Ministry of Health together with the college of pathologists has made this a priority in their present agenda.

*Janakie Fernando*

President, College of Pathologists of Sri Lanka, 2012