



Importance of Studying Disease and Disease Processes



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Editorial

According to Health Encyclopaedia of the University of Rochester Medical Centre, New York, clinical pathology covers a wide range of laboratory functions and is concerned with the diagnosis, treatment, and prevention of diseases. Clinical pathologists are healthcare providers with special training, who often direct all of the special divisions of the laboratory. This may include the blood bank, clinical chemistry, biology, toxicology, hematology, immunology, serology, and microbiology. Clinical pathology also involves maintenance of information systems, research, and quality control. As an emeritus professor of the Department of Laboratory Medicine and Pathology, University of Minnesota, which has over a century of experience teaching this subject, I totally agree with the above definition when it comes to pathology. However, modern pathology is an expanding science and includes many other specialties. Even when I joined the Department of Laboratory Medicine and Pathology half a century ago at the University of Minnesota, we had more faculty from basic sciences than just the pathologists. In view of the fact that we had a strong basic science faculty, our department also offered a course, titled, "Mechanisms of Diseases". I had the privilege of giving lectures on the "role of platelets in thrombosis" to the students of this course in clinical pathology. In view of this experience, I readily agreed to write this editorial for the journal of, "Developments in Clinical and Medical Pathology".

By and large, general pathology deals mostly with analyzing known clinical abnormalities that are markers of diseases and is mostly conducted by anatomical pathologists and clinical pathologists. However, over the years advances in medical research and emerging technologies have changed the definition of this discipline to include, chemists, biochemists, physiologists, geneticists, cellular and molecular biologists. In view of the ever-growing expansion of this discipline academic centers worldwide have developed a new division called, Laboratory Medicine, which is multidisciplinary and performs thousands of tests to aid the physicians and the researchers in their quest to understand the mechanism of diseases. The term Laboratory Medicine commonly used for disciplines that do tests to address or solve clinical problems is to some extent synonymous with clinical pathology. Clinical pathology which used to be a sub-section of pathology,

has developed and matured into an important field among all the branches of modern medicine. Digital age with advances in various emerging technologies has pushed this field into acquiring cutting edge diagnostics in a wide range of areas including, biomarkers assays, imaging technologies, nano medicine, computer sciences, medical electronics and various subspecialties of "omics" as well as digital pathology. In view of these developments in clinical and medical pathology, there is increasing hope for successful development of personalized medicine.

For instance, if we look at the studies related to cardiometabolic diseases, Framingham studies started over half a century ago discovered, major risk factors associated with this cluster of diseases. Western medicine, which is considered disease-centric developed guidelines to reduce or prevent these risks in the general populations. Cohn [1] a pioneering cardiologist from the University of Minnesota has advocated that when addressing a complex disease like ischemic heart disease, it is better to treat the disease rather than just the risk factors. The philosophy of the centre is early disease than abnormal risk factors to be the primary focus for therapeutic interventions. Atherosclerosis is a progressive disease of the vessel walls induced by endothelial dysfunction and vascular pathology. This kind of philosophy was developed based on extensive research in this area which traced progression of the vessel-wall disease to the current state of knowledge.

Much earlier to these findings, studies were in progress in the Mission Hospital, Mysore, India, to determine the cause for low birth weight children. Meticulous records of all children born in this hospital from 1935 has been kept at this facility. On-going studies from the Indian researchers as well as the epidemiology group from the University of Southampton, the UK, have demonstrated that these children with low birth weight are pre-disposed to develop excess weight, obesity and cardiometabolic diseases. Large number of children are born with low birth weight in India (>30%) and China. Robert Freishtat and associates at the children's hospital Washington on DC, have hypothesized that adipocyte-derived exosomes contain mediators capable of activating end-organ inflammatory and fibrotic signalling pathways [2]. These studies have become a part of bilateral investigations between India and

the US. These studies could soon become a game changer for early detection and prevention of obesity-related cardiometabolic diseases.

A multidisciplinary research by scientists of the Farming Heart Study Group discovered the risk factors that promote coronary heart disease. Basic observational studies by the pediatricists at the Children's hospital at Mysore, led to the discovery of relationship between low birth weight and excess metabolic diseases. Now the studies by the Children's hospital Washington DC are trying to address the basic mechanism underlying obesity and metabolic diseases at the cellular level. These observations suggest that understanding the mechanisms of disease will provide the clinicians a better chance to develop personalized medicine. In view of these observations, looks like it is time, we make changes in the medical curriculum to emphasize the importance of multidisciplinary studies. Using the same logic, research at various centers also should take a multidisciplinary approach to problem solving.

I am very glad that the editorial team has started a new journal, *Developments in Clinical and Medical Pathology*. Clinical laboratory sciences have played a very important role in understanding the mechanisms that underlie the initiation, progression and regression of disease processes. I hope the journal will encourage publication of articles in all allied fields of clinical sciences and not restrict to just clinical pathology. I wish the journal all the success in its efforts to educate the clinicians and medical researchers.

References

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