

Editorial

BIOCHEMISTRY AND CLINICAL CHEMISTRY IN THE SERVICE OF MEDICINE

Recent explosive knowledge in the field of molecular biology or biochemistry and its important application in the understanding of biomedical phenomenon and disease processes has secured an important place for it in the medical college curriculum.

Advances have occurred in the essential role of enzyme systems in relation to normal and disease processes particularly in the subject of metabolism. For diagnosis and prognosis, the estimation of acid and alkaline phosphates, amylase, aspartate transaminase, alanine transaminase, lactic dehydrogenase, isocitrate dehydrogenase, have become exceedingly necessary in myocardial; muscular dystrophies; pancreatic; liver; lung and other diseases. Recent analysis of the problems of endocrine disorders, gastro intestinal malabsorption, renal diseases, in-born errors of metabolism and genetic codification etc. have further emphasised the role of advanced biochemistry in our teaching institutions.

Advances in Techniques and Technology

Most of the additional information and its use in medicine has been possible because of tremendous development in new and better techniques for the last quarter of a century. The development of micro and semi-micro techniques, in the estimation of organic and inorganic chemistry of the body fluids, the contribution of paper chromatography, column chromatography, thin layer chromatography etc. for determination of catecholamine amino acids; the use of electrophoresis on paper, cellulose acetate, starch and other gels are excellent methods for examining protein abnormalities, hemoglobins, hepatogolins, serum isoenzyme in differential diagnosis, use of the immunological methods for protein hormone assays etc. are some which can be easily mentioned.

These techniques have been added because of the development in instrumentation. Such gadgets as micro and semi-micro balances, photoelectric colorimeter, photoelectric spectrofluorophotometers, flame photometers, chromatographic columns and chamber, electrophoresis apparatus, radiation measuring instruments in the laboratory or for the body and the recent introduction of the auto-analyser and its graphic recording attachments are playing a very essential role in the service of the sick.

The increased use of the modern micro and semi-micro techniques in the biochemistry laboratory in the hands of a clinical chemist can lead to greater turnover and reduce the patient's stay in the hospital. Greater use of clinical biochemistry in the out-patients can help as preliminary check and even as follow up without the occupation of the greatly needed hospital bed space.

The Role of the Biochemists in Medical College, Hospital

The biochemist for sure believes that detailed understanding of biochemical process is *vital* to the problems of medicine and that a physician who understands what is going on inside the patient is more effective than a physician who does not. For example, in order to appreciate the importance of enzymology, it is obvious that a physician should have general information of the subject which is fairly complex and requires knowledge of physical chemistry, analytical chemistry, mathematics and detailed knowledge of the organic chemistry. Understanding chemical structure of steroids; structure of penicillin and its derivatives; the structure of protein hormones and the structure of R.N.A. and D.N.A. molecules etc. is of course necessary to comprehend their use in physiology, pharmacology, therapeutics, toxicology and medicine.

No one will quarrel with this belief of the biochemist but the same can be said of so many other subjects such as physiology, pathology, embryology, genetics etc.

However, the medical student as he/she enters medical college in this country, has little exposure to any aspect of the pre-requisites for the understanding of detailed normal biochemical processes in the body or in relation to disease. Further, a physician need not know details about carbohydrate metabolism, for example; to recognize sugar in urine as a sign of diabetes mellitus and to prescribe insulin for its treatment. He may however, keep in mind that all reducing substances in urine are not always signs of diabetes mellitus and use of insulin in fructosuria, or lactosuria would be disastrous. It is my view that it is not necessary for a physician to have really detailed and intimate knowledge of biochemistry as a science but he must have information about its basic principles, so that in a teaching college hospital, he can make the best use of it with the help of his biochemist colleagues. It is with intimate collaboration that best use can be made of the clinical material and biochemical facilities. This necessitates encouragement for high quality biochemists and other scientists to enter medical and hospital services. It would be preferable, indeed necessary to train individuals in the subject of biochemistry and medicine. A clinical chemist, medically qualified is likely to act as a consultant and the contributions that he can make for the patient care programme of the hospital would be much better than of a person with biochemistry alone as a background. I should feel happy in consulting a clinical chemist about planning tests and investigation, their interpretation and treatment of any case.

Such specially trained, medically oriented, biochemists are very few in this country. If the necessity is appreciated, I find no reason that a national project to support this essential specialisation in medical science cannot be initiated by the National Health Council or sponsored by the Union Ministry of Health; Indian Council of Medical Research; Council of Scientific and Industrial Research or the Planning Commission without or with active assistance of such agencies (if necessary) as W.H.O; Colombo Plan; or U.S.A.I.D.

Such a project I am convinced will enable hospitals all over the country to be staffed by suitably trained clinical chemists and such a programme will be more than rewarding in the interest of the care of the sick patients.

For academic reasons biochemistry is considered a separate discipline but this separation is clearly artificial. The knowledge acquired by a student when he/she leaves medical college, should be a unified one. I do concede that as a post-graduate speciality in a medical college hos-

pital patient care programme, and for advanced research, biochemistry should be a separate department but for undergraduate studies, it would not be out of place as an important sub-division; preferably, of the department of physiology.

Modern medicine is dynamic and therefore its organization should also continually change.

VISHANU D. MULLICK,
*Professor and Head of the Department of Physiology
and Biochemistry, Lady Hardinge Medical College,
New Delhi.*