One Year of Clinical Pathology

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"There is a tide in the affairs of men,
Which, taken at the flood, leads on to fortune".

Mine was indeed a very low tide, when one year ago, through no fault of mine, I found myself in charge of the Clinical Laboratory at St Luke's Hospital. To be sure, it was at that time only a small room with a table, eight or nine reagent bottles, and some test-tubes. There was too, a very modern electric centrifuge, apparently without ball-bearings as the children in an adjacent ward mistook its noise for that of a jet-propelled aeroplane. Since then the small room has grown into a glorified ward laboratory.

A pathologist is a hero — since I am not a pathologist, I am no hero — but I suppose I deserve to be mentioned in despatch for during these twelve months I have been criticised, threatened and occasionally manhandled by clinicians on the sad occasions when laboratory findings did not fit in with the clinical diagnosis.

When I was asked to contribute a paper I decided to look over the laboratory tests carried out since January this year and to write down my impressions, in the hope that they might be of some use to medical students. A clinical laboratory requires much equipment, but the most essential are method and distilled water. My impressions are :

1. Blood Counts and other Blood Tests.

Leucopenia is commoner in Undulant than in Typhoid Fever — presumably because of the frequency of Bronchitis in the latter. In Undulant Fever the white cell count varied from 4,200 to 6,000. In uncomplicated Typhoid, however, the count is lower, sometimes as low as 2,000. Lymphocytosis is about equal in the two diseases.

The haemoglobin percentage is lower in Undulant than in Typhoid Fever — probably due to the chronic nature of the former malady.

In Typhus the white cell count is rarely below 7,500 and lymphocytosis is not at all a distinctive feature. Malignant Undulant shows very low white counts — 2,000 in one particular case with Undulant Hepatitis and delirium.

In all cases of marked anaemia, a study of a blood smear is essential. The stains in use are Leishmann, Wright, and Giemsa. All give very good results, but Giemsa is my favourite.

Platelet counts have a wide range of error. One case of thrombocytopenic purpura had a platelet count of 5,000 and a bleeding time of 15 minutes.

There are three tests which require method and precision. The first is the Prothrombin Time Estimation. Always use controls and express the result as per cent of the normal. The lowest figure I obtained was 50% of normal in a case of thrombosis of the left lower limb under treatment with Heparin and Dicoumarol. The second is the Fragility Test. The third is the Reticulocyte Count — my highest count was 38% in a case of pernicious anaemia under treatment.

2. Examination of Faeces.

In testing for occult blood always use new test-tubes. Several tests are available, but the Benzidine Test gives best results.

Examining for Entamoeba histolytica is a challenge — time and experience are necessary for its isolation.

3. Test-Meals.

These are very useful in the diagnosis of Macrocytic Anaemia and newgrowth of the stomach. Otherwise they are of little use. The Histamine-Alcohol test-meal is preferable, because of its cleanliness and reliability.

4. Cerebro-Spinal Fluid.

This is a very important chapter in clinical pathology. In short, the following are important: appearance, protein content, sugar content, cell count and differential count. In clear fluids the Tryptophane Test is helpful.

In Tuberculous Meningitis the differential cell count in infants and in adults is different. In the former, polymorphonuclear cells predominate, whereas, in the latter, the lymphocyte is the distinctive cell. Sugar is always diminished; even after treatment with Streptomycin, it rarely returns to normal. The Tryptophane Test was performed 14 times, 8 times on C.S.F. from tuberculous meningitis, 6 times on normal C.F.S. It was positive in the tuberculous fluid, and negative on normal fluid. This test is reliable, provided the fluid is neither turbid nor xanthocromic.

In streptomycin-treated tuberculous meningitis, during the first month the streptomycin is given intrathecally and the C.S.F. shows a steady improvement. In one case, however, treatment had to be discontinued owing to violent reaction to streptomycin — there was a rise of protein and cell content in the spinal fluid. All relapsed cases showed a high protein content (as high as 250 mgm. %) and a relatively low cell count, say 30 lymphocytes, — evidence of block. The question whether the block is caused by an arachnoiditis brought about by the irritant action of streptomycin, or whether it is due to the tuberculous process itself, cannot be answered with certainty.

5. Liver Function Tests in Cases of Jaundice.

The classification of jaundice proposed by Ducci is both practical and scientific; he distinguishes between medical and surgical jaundice. Medical Jaundice includes the prehepatic (haemolytic), and the hepatic, which may be due to infective, toxic, and obstructive causes. Surgical Jaundice is called post-hepatic and includes jaundice caused by newgrowth of the head of the pancreas, gall stones etc. Important information is obtained from the history and physical diagnosis.

The haemolytic varieties of jaundice may be recognised by appropriate study of the blood and of the products of breakdown of haemoglobin. There is no evidence of serious hepatic dysfunction. The post-hepatic varieties show signs and symptoms of interference with biliary flow. There seldom is evidence of seriously disturbed hepatic function unless the jaundice is of long duration. In hepatic jaundice there is, as a rule, no evidence of long-continued interference with the flow of bile into the intestine, and in contrast with the afore-mentioned types, there is early and conclusive evidence of disturbance of metabolic functions of the liver. The large number of liver function tests testify to their inadequacy to provide a foolproof answer. Most liver function tests by themselves do not make a diagnosis, but, at best, point to certain abnormalaties such as the presence of liver insufficiency, the clinical significance of which is largely a matter of interpretation to the physician (Dyke, Recent Advances in Clinical Pathology, Churchill).

Isolated laboratory findings in the differential diagnosis of jaundice are of little use and are usually inconclusive without clinical data. The best method is to carry out the simple tests, serially repeated; of these the most valuable are serial qualitative urobilinogen estimations in the urine and the faeces, and the thymol turbidity test.

The available tests of liver function cover a wide range of functional activity, but unfortunately each test is highly specific for a given function. In addition, in pathological

conditions of the liver all functions of the liver are not impaired to the same extent; therefore it is possible through improper selection of the test to obtain normal findings in an organ that is actually considerably damaged. Thus it is advisable to use a group of well selected tests, rather than a single one.

Finally the clinical laboratory is not a slot-machine, but rather an aid to the clinician who should interpret the pathologist's result in the light of clinical findings.