LITERATURE REVIEW

A Brief Review of the Hematologic Literature from India (1959)

By J. B. Chatterjea

NUTRITIONAL DISORDERS

Nutritional macrocytic anaemia as it occurs in India represents varying degrees of folic acid and/or vitamin B₁₂ deficiency. Cases reported from various parts of the country have been known to vary in their relative proportion of vitamin B₁₂ and folic acid deficiency, variation being presumably due to difference in dietary habits. Fecal excretion of Co⁶⁵-labelled vitamin B₁₂ was studied in 9 patients from the eastern part of the country. In 5 cases in which serum vitamin B₁₂ was low, the absorption pattern was normal. In the remaining 4 cases, serum vitamin B₁₂ content was normal, anaemia being presumably due to folic acid deficiency; in two of these the intestinal absorption of B₁₂ was definitely normal; in the other two the pattern indicated intestinal malabsorption.¹ It is thus possible that a malabsorptive factor may supervene secondarily on a clinical state induced primarily by dietary deficiency. While the role of dietary inadequacy is recognized, it should be mentioned that earlier studies from the Southern and Western parts of India had pointed to malabsorption as the main factor.

From Bombay, Jhala and Gadgil reported their observations on vitamin B₁₂ content in samples of human liver. Regarding extraction procedures, they found that autoclaving was as effective as enzyme digestion.² They further compared the vitamin B₁₂ content of the liver tissue as obtained with a Vim-Silverman needle within 12 hours of death with the bulk sample of the corresponding liver obtained after opening the body. In 10 of 12 cases studied, there was close agreement between the two sets of values.³

In an investigation of 203 Indian children from Bombay, the commonest type of anemia was found to be due to iron deficiency.⁴ Eleven cases of idiopathic–hypochromic anemia were reported in young adult males; the question of loss of iron through sweat and deficient intestinal absorption due to high phytate content of the vegetarian diet was discussed in relation to the etiology of iron deficiency anemia.⁵ From the Nutrition Research Laboratories (Hyderabad), the excretion of iron in sweat was reported to be low in iron deficiency, the excretion becoming nearly normal with normalization of blood values.⁶ The influence of phytates on iron absorption was studied by metabolic experiments on four healthy adult males kept on a daily iron intake of about 22 mg. In the diet, the proportion of phytate-P to total P was kept at 8 per cent or 40 per cent. Average iron retention was 2.483 mg, in the former and 0.173 mg, in the latter series. Added sodium phytate was found to reduce the iron absorption from the intestine.⁷

With the use of a paper chromatographic procedure, the glutamic oxalacetic transaminase activity of erythrocytes was found to be markedly elevated in hypochromic anemia.⁸
Some aspects of the problem regarding the relative values of oral and parenteral iron therapy were briefly discussed with a note on the possible hazards of indiscriminate use of parenteral iron.9

From Lucknow, a number of papers was published pertaining to various aspects of the anemia of infection. In rabbits, physical hypothermia did not produce any change in plasma iron.10 Blocking of the reticuloendothelial system by Evans' blue resulted in marked hyperferremia.11 In human infection iron absorption was found to be impaired, and intravenously injected iron was rapidly removed from the plasma.12 In experimental infections, increased amounts of iron accumulated in liver, spleen and bone marrow.12

From a study of 53 cases of cirrhosis of the liver, it was concluded that in the causation of anemia, factors of hypervolemia, hemorrhage, dyserythropoiesis and hemolysis may operate singly or in combination.13 In a study of erythrocyte sedimentation in infectious hepatitis, the rate in the majority of the cases (11 out of 15) was found to be below 5.0 mm.14

HEREDITARY ANEMIAS AND RELATED DISORDERS

Thalassemia is present all over India.15-17 In the Bengalee population the incidence of heterozygous thalassemia and of Hb.E approximates 3.7 per cent and 3.9 per cent, respectively. Thalassemia either in homozygous form or in combination with Hb.E is the commonest type of hemoglobinopathy seen in Bengalees.15 Hb.E has also been found in Assamese, Nepalese and in a Jat Sikh family.18 Clinical and hematologic features of 80 cases of Hb.E-thalassemia disease were described and the findings compared with those of homozygous thalassemia.15 A critical analysis was also made of the data in the two groups—Hb.E heterozygote and thalassemia heterozygote.15 A2 component was studied in paper electrophoresis; in homozygous thalassemia, the A2 was elevated when considered as a percentage of total Hb.A, excluding F. Results of splenectomy were reviewed in a series of 32 patients.21 Details of splenic histology were described.21 Histochemical studies of foam cells in thalassemic spleens showed prominent PAS reactions due to the presence of neutral mucopolysaccharide-protein complexes.22

Hb.S has so far been found mostly, if not exclusively, in the aboriginal tribes. A few more instances of Hb.S-thalassemia were recorded.15 Hb.D originally described in Sikhs and Gujratis was recently reported among the scheduled castes (Adikarnatak) of Mysore.15 Hb.J and Hb.L were reported in Gujarati-speaking Lohana families from Bombay23 and Hb.K. in Bengalees.15 In a series of 2500 blood samples from unrelated Indian residents in Malaya, the incidence of abnormal hemoglobins was as follows: D-13, E-8, J-1, K-11 (in 4 families) and L-2.24

Nature of hemoglobin present in the red cells of 11 fetuses, 15 to 28 weeks of age, was studied with paper electrophoresis and alkali denaturation techniques. A specific embryonic Hb, different from A and F, could not be detected.25 In a study of 103 fetuses, no significant correlation was found between the proportion of Hb.F and the fetal age.26

There were interesting reports on hereditary spherocytoses,27 Niemann-Pick disease28 and heredity methemoglobinemia.29
Leukemias and Allied Disorders

Analysis of a series of 307 cases of leukemias investigated in Calcutta during 1949 to 1958 showed the following type of distribution: acute group—myeloid 63, lymphocytic 53, monocytic 33 and undifferentiated 5; chronic group—myeloid 116, lymphocytic 17 and plasmocytic 6; subacute group—myeloid 8 and lymphocytic 4. In the series there were 45 children; 42 cases were acute, lymphocytic being the commonest, followed by myeloid, monocytic and undifferentiated, in that order. Dietary habits, economic status, place of residence (urban or rural), infections, exposure to myelotoxic drugs and x-rays did not appear to have played any definite etiologic role. Details of 161 cases of Hodgkin's disease, a clinicopathologic study, were presented from Bombay. A case of acute myeloblastic leukemia, first observed during the seventh month of pregnancy, was reported from Bombay; after 10 days, the mother delivered a still-born child and died; the child did not show any manifestations of leukemia. An interesting case of agnogenic myeloid metaplasia was reported.

An interesting finding, not previously reported, was the relative increase of the free fraction of serum vitamin B₁₂ in acute myeloid leukemia, erythroleukemia and aplastic anemia.

Other Reports

Hematologic findings of 73 workers of the x-ray department in 8 hospitals of Bombay were recorded. None of the workers was exposed to an annual dosage greater than 5 r. A variable degree of lymphocytosis was observed in 34 persons; 15 showed bilobed or binucleated lymphocytes in their blood smear.

Antisera against leukocytes of guinea pigs were produced in rabbits. Such antisera when injected into guinea pigs produced variable changes in blood and bone marrow, depending mainly on the dose, route and frequency of administration. Three ml. of serum injected subcutaneously were found to produce marked bone marrow hypoplasia, (immunoaplasia). In a study of the blood groups of 300 siblings of 99 Parsi families from Bombay, two unrelated persons with R₅ chromosomes were detected. Both these subjects were negative for D antigen. Thirty-eight cases of Rh sensitization were reported, the different antigens involved being as follows: D-28, C-1, C and D-8 and E-1.

In a study from Amritsar, 10 instances of air embolism were recorded in a series of 3500 blood donations. The causes of this complication were discussed.

A brief report on the work of the Haematological Unit (Indian Council of Medical Research) during the last decade recorded observations on nutritional macrocytic anemia, dimorphic anemia, hemoglobinopathic syndromes aplastic anemia, patterns of hemophilia syndrome, thrombocytopenic purpura, tropical eosinophilia and Kyasanur Forest disease—a new disease due to an arthropode-borne virus.

REFERENCES


27. Chatterjea, J. B., and Ray, R. N.:
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COMPARISON OF INTRAMUSCULAR IRON-DEXTRAN AND ORAL FERROUS SULPHATE IN THE TREATMENT OF IRON-DEFICIENCY ANEMIA. Wei Liang Yu, et al.
From the State University of New York College of Medicine, Brooklyn, N. Y.

The authors compare the effectiveness of intramuscular iron-dextran (Inferon) and oral ferrous sulfate-molybdenum oxide (Mol-iron) in the treatment of iron deficiency anemia in infants and children. In addition, they evaluate the effectiveness of the iron-dextran complex in the treatment of iron-deficiency anemia complicated by transient infection and in the treatment of the anemia associated with lead poisoning. In patients with uncomplicated iron deficiency anemia the average gain in hemoglobin concentration in the first and second weeks after intramuscular therapy was 2.1 and 2.2 Gm. per cent. In cases complicated by infection the average gain in the first and second weeks was 1.8 and 1.7 Gm. per cent. In cases complicated by lead poisoning, the average gain was 0.7 and 1.3 Gm. per cent. In patients with uncomplicated iron deficiency anemia treated with oral iron, the average gain in hemoglobin concentration was approximately 1.0 Gm. per cent in each week. Of the 72 children treated with intramuscular iron-dextran complex adverse reactions were limited to staining at the site of injection in one patient and urticaria in another patient. The authors conclude that therapy with intramuscular iron is desirable in situations in which rapid elevation of the hemoglobin concentration is important and in which parental unreliability might prevent proper administration of oral iron. The intramuscular iron is also considered to be a more rapid and more dependable method of replenishing depleted iron stores.—I. S.
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