ABSTRACTS

WILLIAM H. CROSBY, LT.COL., MC, U.S.A., Editor

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J. H. Akeroyd, Lt. Col., MSC, Washington
A. A. Bagdasarov, M.D., Moscow, U.S.S.R.
T. H. Bothwell, M.D., Johannesburg
Walter A. Cervoni, M.D., San Juan, P. R.
Joyti B. Chatterjers, M.D., Calcutta, India
Jean Daussat, M.D., Paris, France
G. C. de Gruchy, M.D., Melbourne, Australia
Pietro de Nicola, M.D., Pavia, Italy
Solomon Estren, M.D., New York
R. R. Girdwood, M.D., Ph.D., Edinburgh
M.-H. Hûrder, M.D., Freiburg, Germany
Theodore H. Spaet, M.D., New York

COMPLICATIONS OF THERAPY


As a plasma substitute, dextran is usually used in the form of 6 per cent dextran in normal saline. Three previous groups of workers have reported hemorrhagic tendencies from its use. A 26-year old male patient with type II nephritis was given a total of 270 Cm. dextran as a 10 per cent salt-free solution. Diuresis was satisfactory, but massive hematuria occurred and lasted for 15 days. The prothrombin percentage was low, and the one-stage clotting time and whole blood clotting time were prolonged.

Dextran has been claimed to form a complex with fibrinogen, but the way in which it causes bleeding, a matter discussed in this article, is not yet clear.—R. H. G.

ANEMIA OF THE NEWBORN


Erythrocyte production in premature infants was investigated by meticulous reticulocyte studies. The amount of stainable iron was studied in bone marrow preparations, using the Turnbull stain. During the first days of life, the rate of red cell formation is high, then rapidly decreases until two weeks of age. This decrease is caused by improved oxygen supply and transient cessation of growth. Then a period of reduced erythropoiesis follows, short (1 to 2 weeks) in the smallest preterms, longer (3 to 4 weeks) in the heavier preterms, and longest in full-term infants. It is replaced by a period of intensive, and, in the smallest babies, even highly intensive erythrocyte regeneration. The main reason for the low blood values in premature and full-term infants during the first months of life is probably their relatively low oxygen consumption, when rate of growth is not particularly high. Growth exerts a stimulating effect on erythropoiesis, probably because it requires an increased oxygen consumption. To some extent the early anemia of prematurity is due to the fact that in the period of most rapid growth the blood-forming organs are not able fully to meet the demands. The pathogenetic factors leading to the postnatal drop in hemoglobin level are (1) growth, (2) increased hemolysis, (3) a transient decrease in erythropoietic activity.
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Immediately after birth little or no stainable iron is present in the bone marrow. In the following weeks a marked increase can be demonstrated, the greatest amounts being found between 4 and 8 weeks after birth. After this point iron stores decrease, until finally no hemosiderin can be demonstrated, 6 to 12 weeks after birth. In the lowest weight group hemosiderin disappears earlier than in the heavier infants. In full-term infants the bone marrow becomes hemosiderin-free at 16 to 20 weeks of age.

The smallest premature should receive iron medication from 4 to 6 weeks and the heavier ones from 6 to 8 weeks of age, with infants showing the most intensive growth receiving medication somewhat earlier than the others.—M. S.


In the Heinz body anemia which occurs in the newborn, jaundice occurs in the first few days of life. Anemia appears as the jaundice fades, but before the Heinz bodies are seen in many of the red cells. These are intracellular inclusions which stain with supravital dyes, but not with Romanowsky stains, and are thought to be particles of denatured hemoglobin. Two further cases are here reported. One was a full-term male twin whose twin sister was not affected. Jaundice was noticed at two weeks. There was severe hemolytic anemia with many distorted red cells and a few spherocytes, and nearly a third of the red cells contained Heinz bodies. The other was a 30-weeks premature female infant. On the thirteenth day an abscess developed in a buttock. There was severe anemia with Heinz bodies and numerous distorted red cells, but no jaundice. Both patients responded to blood transfusions.

This type of anemia should be remembered in the differential diagnosis of hemolytic anemia of the newborn. There is an excellent response to transfusion, but if left untreated the patient may die. Even without jaundice, if marked anemia develops in the premature infant during the second or third week and contracted, irregularly crenated erythrocytes are found in the smears, Heinz bodies should be sought.—R. H. G.


Hematological findings of 50 mature newborns of normal Indian mothers are recorded. The mean Hb., R.B.C. hematocrit and reticulocyte values on the first day were 17.18 Gm., 5.01 million, 54.5 per cent and 4.9 per cent respectively. On the fourth day these values dropped to 16.05 Gm., 4.71 million, 49.9 per cent and 1.2 per cent., respectively. Red cells were always macrocytic and normochronic.—J. B. C.


The interest of the report is the rarity of the case at such an age. A complete pathologic and hematologic study is presented. Clinically there were necrotic lesions of the eyelids and an ulcer in the right inguinal region. No drugs could be implicated.—M.A.J.

CONTRIBUTION TO THE QUESTION OF BLOOD TRANSFUSION IN APLASTIC PANCYTOPENIA. Donner L. and Hronec L. From the 2nd Medical Clinic, Charles University, Prague, Czechoslovakia. Vnitrni lékařstvi 2:627-631, 1956.

A case is reported of idiopathic aplastic pancytopenia in a male of 27 who in the years 1950 to 1954 has had 181 blood transfusions (61,800 ml. of blood in all). In spite of repeated blood transfusions, the blood picture showed no improvement. Finally, the patient
refused further transfusion, the blood picture became completely normal, except for a slight leukopenia, and the patient is feeling well. It is suggested that frequent blood transfusions and large amounts of blood may suppress the medullary blood formation.—M.N.


An analysis was made of results of splenectomy in 5 aplastic pancytopenias, 4 panmyelopathias and 3 splenic neutrocytopenias. In the group of aplastic inhibitions, a complete recovery was achieved in but one patient. Three others died of various complications several days or weeks following splenectomy. The severe course of the disease in the last patient suffering from panmyelophthisis due to gold therapy failed to be influenced by splenectomy, and the patient died three months after the operation. In the group of patients suffering from panmyelopathy, a distinct improvement was recorded in one patient, in another one the necessity of blood transfusions was restricted and two patients practically failed to be influenced through splenectomy. In the group of splenic neutrocytopenias, an instantaneous recovery took place in one patient with primary splenic neutropenia; in two patients with Felty's syndrome the rise in neutrophils was delayed and the tendency to neutropenia still lasts. Splenectomy failed to exert any influence upon the joint symptoms.—M.N.


With 45 healthy people, the average content of zinc was found to be 2.3 gamma/ml. in plasma, 7.9 gamma/ml. in whole blood, 0.26 gamma/ml. in leukocytes and 6.2 gamma/ml. in erythrocytes. Determinations of zinc level in 32 cases of various blood diseases led to following conclusions: zinc in plasma was decreased in aplastic anemia, in pernicious anemia, and in chronic leukemia; it was raised in hemolytic anemia and in polycythemia. Whole blood zinc was decreased in aplastic anemia and in chronic leukemia. Zinc in erythrocytes was raised in aplastic anemia, in pernicious anemia and in polycythemia; it was decreased in hemolytic anemia. Zinc in leukocytes was considerably raised in aplastic anemia (as much as 390 per cent above normal); in chronic leukemia, the content of zinc in leukocytes was decreased.—M.N.


In response to an induced infection (designed to test the susceptibility to malaria), two brothers with hemoglobin levels 5.5 Gm. (F Hb. 19.7) and 3.19 Gm. (F Hb. 18.7) respectively, developed fever when P. falciparum was demonstrated in blood. Malaria was quickly controlled. One month after the disappearance of malarial parasites, there was evidence of "aplastic crisis" with neutropenia, reticulocytopenia, thrombocytopenia, increasing anemia, fall in plasma bilirubin level and gross hypoplasia of marrow. Subsequently the bone marrow quickly regenerated and blood counts nearly reached the original levels within 2 weeks.—J.B.C.

HEMOGLOBIN

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The author could show experimentally that though the speed of denaturation in n/10 HCl was equal for fetal and permanent human hemoglobin there was a significant difference if a fractionated denaturation was performed by adding ammonium sulfate to the hydrochloric acid solution and interrupting the denaturation process with sodium hydroxide. The alkaline denaturation method is superior as a practical procedure for the denaturation of fetal hemoglobin, but the reported findings might be of importance as a means in further studies of the structure of fetal hemoglobin, and in the analysis of atypical alkali-resistant pigments—M.H.H.


The micro gasometric method for oxygen determination in blood works well with the blood from humans, dogs, rabbits, and rats, but may be difficult, sometimes impossible, to use on the blood of cats, birds, or fishes, where the reagents do not properly break up the blood proteins into a flocculate precipitate, but produce a viscid foam. By increasing the acidity of the final blood mixture, with due changes in technic, this difficulty has been overcome.—O.P.J.


Since several species of cold water antarctic fishes lack hemoglobin, it was considered necessary to determine whether or not a similar condition obtained for cold water arctic fishes. Four species of fishes were caught in northern Labrador at depths of 100 meters. Blood was taken from them by heart puncture and iron analyses performed. The values ranged from 8.5 to 21 mg. per cent, which would normally correspond to an oxygen capacity of 3.4 to 8.4 vols. per cent. Low hemoglobin content may be found among cold water arctic fishes as well as among cold water deep sea fishes of more southern latitude.—O.P.J.

RADIATION DISEASE


Recovery from otherwise lethal doses of total body x-irradiation is promoted by lead-shielding of the exteriorized spleen during irradiation and by injection or transplantation of living hematopoietic cells after irradiation. The protective activity of either of these procedures is different in the mouse, rat and rabbit. Mouse marrow seems to exert greater protective activity than marrow from the rabbit, and it also affords protection against radiation levels at which rabbit bone marrow is apparently ineffective. There are probably two reasons for this disparity. First, a species difference in the relative radiosensitivity of the gastrointestinal tract. Second, the closeness of the genetic relationship between host and marrow donor. Male rabbits were exposed to 800r, 900r and 1000r total body x-irradiation. They were subsequently injected with bone marrow from female rabbits from different stocks of New Zealand and whose skin homografts were not accepted by the males. The female heterophil nuclei (neutrophilic leukocyte nuclei in the human) in the male were identified by the "drum sticks" of Davidson and Smith. By using this biologic marker it was possible to determine that 15 per cent of the animals receiving 800r, 38 per cent of those receiving 900r and 62 per cent of those exposed to 1000r had heterophils bearing nuclear "drum sticks" characteristic of the female in the male circulating blood.
within 3–4 days. The 100 per cent mortality following 1000r, despite successful marrow transplantation and hematopoietic recovery, seemed to be largely due to the relative radiosensitivity of the gastrointestinal tract.—O.P.J.

LYMPHOMA


This is an exhaustive analytical study of 253 post mortem cases of follicular lymphoma, both from the histologic point of view, and from the viewpoint of clinicopathologic correlations. Histologically, the authors suggest five groups of this type of lymphoma: (1) follicular lymphoma, lymphocytic type, well differentiated; (2) follicular lymphoma, lymphocytic type, poorly differentiated; (3) follicular lymphoma, mixed (lymphocytic and reticulum cell) type; (4) follicular lymphoma, reticulum cell type; and (5) follicular lymphoma, Hodgkin’s type. They suggest such terminology rather than that ordinarily used, since they consider that the formation of follicles or nodules is not basic to the lymphomatous process, but merely subsidiary in these certain cases of malignant lymphoma. The 5-year survival rates were highest in group 5 (67%), and lowest in groups 3 and 4 (16% and 20%, respectively).

Symptomatology is discussed. The most common presenting symptoms were weakness (in 60% of the patients), splenomegaly (60%), abdominal tenderness (47%). X-ray findings and results of therapy are discussed. From the hematologic point of view, it is of interest that an initial leukopenia was uncommon (6.5% of cases), but initial lymphocytosis (over 4,000 per cu. mm.) was present in 16% of the cases. In one patient, a fixed bone marrow aspirate showed follicle formation, and thus made the diagnosis. In a few cases, abnormal lymphocytes were present in the blood and suggested the diagnosis ("lymphosarcoma cells").—S.E.


A unitarian concept of proliferations of the reticuloendothelial system is neatly summarized in this discussion of cellular differentiation and maturation. The pluripotential nature of the primitive reticuloendothelial cell is reaffirmed. "Intermitotic" cells are reservoirs for new cellular life, producing daughter cells of which one group is perpetually young and undifferentiated, and another group ("differentiating intermitotics") divides to form cells which show progressively more differentiation and maturation. Since mature cells do not divide, "de-differentiation" is impossible, and neoplastic tissue is the result of arrest in the differentiation at one or more immature stage.

All lymphomas, therefore, are mixed, even though one cell type often predominates; and it is no surprise to see different diagnoses for different masses of lymphoma in the same patient, or even for different areas of the same lymphoma. Some 25% of all malignant lymphomas, according to the author, show metamorphosis from one type to another. According to the stage at which the maturation arrest occurs, the author distinguishes giant follicular lymphoma (most mature cell type), lymphocytic lymphosarcoma, lymphoblastic lymphosarcoma, Hodgkin’s disease, and reticulum cell sarcoma (most immature type).

These concepts are not, of course, new; their presentation is striking.—S.E.

Review of complete postmortem records in 86 cases of Hodgkin's disease revealed that in 22 cases (26%) the thymus was grossly involved by Hodgkin's disease. In the remaining 64 cases (74%) no involvement of the thymus was observed. The general distribution of the thymic weights in 54 cases in which the thymus was grossly uninvolved showed considerable involution of the gland such as is common in many chronic wasting diseases. Involvement of the mediastinal lymph nodes was observed in 55 of the 64 cases in which the thymus was grossly uninvolved and in 21 of the 22 cases with thymic involvement.

The data reported provide little support for the hypothesis that the thymus is the primary site of origin of Hodgkin's disease, even though they indicate that it may become involved in about 25% of cases. In the majority of these the involvement occurs as part of extensive Hodgkin's disease of the mediastinum.—H.R.


Twelve cases of Hodgkin's disease were treated with nitrogen mustard (10 cases) and TEM (2 cases), respectively. A tendency toward the normalization of the plasma proteins was observed after the treatment, with particular respect to the diminution of alpha-2-globulins. This finding was considered to be due not to the direct action of the cytotoxic drugs on the plasma proteins, but rather to the general improvement of the disease.—P.d.N.


Twelve patients of Hodgkin's disease were treated with P³², at the dose of 1 to 4.5 mc., up to a total dose of 6 to 36 mc., orally. In five cases a considerable improvement was obtained. A partial and short benefit was observed in five cases. No significant results were obtained in two cases.—P.d.N.


Of 8 children with lymphosarcoma, aged 4 months to 15 years at the time of presentation, 3 were alive at the time of this study. Respectively, these 3 patients were living 2½, 14½, and 22 years after the onset of the symptoms. The last named patient had been found, at the age of 7 years, to have lymphosarcoma of the ileum, which was treated by resection followed by x-ray therapy; 22 years later, he was free of disease and apparently normal.

Lymphosarcoma was found to comprise 6.3% of 1800 malignant tumors of infancy and childhood. The point is made that it is not invariably fatal.—S.E.

APLASTIC ANEMIA

CYTOSPECTROPHOTOMETRIC STUDIES OF THE BLOOD CELLS. II. STUDIES ON THE ERYTHROCYTES IN APLASTIC ANEMIA. Hiroshi Watanabe. From the Department of Pathology, School of Medicine, Keio University, Tokyo. Acta Hematologica Japonica 18:182-191, 1955.

Erythrocytes of various anemias, especially of aplastic anemia, were studied microspectrophotometrically as a single cell. The absorption spectra of the normal erythrocyte had three absorption bands at the wave lengths of 400 mμ—420 mμ, 510 mμ—540 mμ.
and 580 m\(\mu\)–620 m\(\mu\); the first one was most distinctive and was interpreted as corresponding to the Soret-band of hemoglobin. In pathohistologically confirmed cases of aplastic anemia, the absorption curve of erythrocyte differed from that observed in normal persons and in cases of other types of anemias, including leukemia. It had no first absorption band, Soret-band. It is considered that this difference is derived from the stability of combination of the stromatin with the hemoglobin in the red cell in aplastic anemia and, therefore, should be taken into consideration in making differential diagnosis.—K.M.

The Other Journals of Hematology


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