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BONE MARROW AND BLOOD FORMATION

MYELOID METAPLASIA. M. Block and L. O. Jacobson. From the Department of Medicine, University of Chicago, Chicago, Ill. J. A. M. A. 145: 1390-1396, 1950.

This review of "myeloid metaplasia" is based on a study of 12 cases in which the diagnosis was made on clinical, hematologic and pathologic grounds; and on study of comparative anatomic, embryologic and experimental considerations of hematopoiesis. "Myeloid metaplasia," it is pointed out, can be diagnosed only by biopsy of liver or spleen, although certain clinical and hematologic features are common to patients with this disorder (weakness, hemorrhagic tendency, leuko-erythroblastic anemia, hepatosplenomegaly). The bone marrow, it was found, might be fibrotic, hyperplastic or infiltrated with neoplasm. An underlying etiologic disease might be present (tuberculosis, metastatic carcinoma, osteosclerosis, etc.); or "myeloid metaplasia" might be idiopathic.

The authors consider "myeloid metaplasia" to be a nonspecific response of primitive, multipotential cells of the liver and spleen to a variety of stimuli. They stress that this response is fundamentally different from leukemia; whence the importance in differentiation of the two diseases, since treatment and prognosis are different.—S.E.


The field of comparative hematology is very large and interesting but relatively few papers have been published on this subject within recent years. Material for the present investigation was obtained chiefly from the gastropod mollusc Busycyon carica. The circulating blood contains three types of cells: (1) lymphoid cells which are relatively scarce, (2) granular macrophages which are the largest and most numerous and (3) eosinophilic granular amebocytes. Some hemopoiesis takes place intravascularly by mitosis. Plasma turns blue upon exposure to air due to the presence of hemocyanin. Extravasated blood does not coagulate but the cells agglutinate.—O.P.J.

THE TIME FACTOR IN LETHAL EFFECTS OF TOTAL ROENTGEN IRRADIATION IN TRITON. V. V. Brunst and E. A. Sheremetieva-Brunst. From the University of Maryland School of Medicine, Baltimore, Maryland. Am. J. Roentgenol. 62: 550-554, 1949.

The authors have exposed adult Tritons (triton cristatus, anthropia, u odela) to equivalent amounts of roentgen radiation in a single or fractional dose. Their results indicate that the lethal effects of the irradiation are related to the total dosage rather than the manner in which it is given.—C.A.F.
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The author describes a process regarded by him as a secretion of reticulocytes by normoblasts. This process is studied in sections from human embryos and also in bone marrow smears from adults. The same observations have been made by Lisa Boström in Sweden and have been reviewed in this journal.—J.W.


This study was done preliminary to the study of the effects of various endocrines on lymph flow. Eighty-eight normal male rats of the Long-Evans strain were used in this experiment. Their ages were 40, 60 and 100 days. Ether produced a 30 per cent absolute increase in lymph flow and a 40 per cent decrease in cell content when compared to sodium pentobarbital anesthesia, but only in the forty day old rats. Similar results were not obtained in the older animals.—R.C.C.


This paper deals with the effects of ether, sodium amytal, sodium pentobarbital and hexobarbital on blood and plasma levels of glucose, albumin, globulin, non-protein nitrogen, chloride and cholesterol in rats. The barbiturates depressed the level of hemoglobin, total protein and glucose. Ether elevated the blood sugar, but this effect was only 10 mg. per cent during the first several minutes of anesthesia. Ether did not change the hemoglobin, total protein, A/G ratio, NPN, chloride or cholesterol.—R.C.C.

ERYTHROCYTES AND ERYTHROCYTIC DISEASES


The author has developed a method for measuring the thickness of spherical or cylindrical membranes under certain conditions. When applied to the human red cell ghost in glycerol the thickness of the wet membrane comes out at about 0.5 μ with an error of approximately ±0.2 μ—a value about ten times greater than previous estimates.

If the membrane is as thick as this the dimensions of the intact cell show that the inner edges of the membrane will just touch in the middle of the disc, making the shape more stable. It also follows that if the membrane is 0.5 μ thick it must contain large quantities of hemoglobin within its structure and that the radial orientation in the membrane which causes the negative intrinsic birefringence is due to protein rather than lipid.

To give the required negative intrinsic and positive form birefringence it is suggested that the long stromatin molecules may be arranged in looped bundles like squibs, the long axes running at random in the plane of the surface, but with the main parts of the protein chains within them lying radially.—S.C.


The authors observed rabbits in high altitudes and in the decompression chamber. They noticed an increase in blood catalase. After administration of small amounts of cobalt
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there was a further increase of catalase and a decrease of the animals' respiration frequency. It is believed that the cobalt atom replaces in the catalase molecules an Fe atom which may be used for additional Hb synthesis.—C.M.


The authors observed in 225 of 1251 new born (18 per cent) a spontaneous Heinz body formation up to 150 per thousand. There was no connection with anemia, erythroblastosis or jaundice, but to some extent with premature birth. In two cases which died, there was a marked atrophy of the spleen. The spontaneous Heinz bodies may be distinguished from toxic bodies (caused by sulfonamide etc.) by their brilliant clear appearance in the picture of the phase contrast microscope, whereas the exogenous toxic products are dark. Concerning the pathogenesis the author presumes a combination of a disturbance in development in utero with an atrophy of the spleen which slows down the normal destruction of the erythrocytes.—C.M.


The author describes the noncharacteristic complaints and symptoms in patients with iron deficiency without marked anemia. The fasting serum iron level is low. A peroral iron tolerance test and estimation of three iron values within seven hours allows recognition of the latent iron deficiency. The clinical symptoms are referred to a lack of myoglobin-cytochrome (and tissue) iron.—C.M.


This is a description of a 53 year old patient with chronic, predominantly intramedullary erythroblastosis without additional signs of leueaeemia (erythroleueaeemia) and without myelosclerosis. In the peripheral circulation were found only few erythroblaesa, whereas in the bone marrow there was observed a high grade morphologic differentiation of the young erythrocytes, which distinguishes these cases from those described by Heilmeyer. Therefore the picture is designated by the authors as “real chronic medullar erythroglobastyoma.”—C.M.

Oxygen Dissociation Curve for Hemoglobin in Blood in Liver Diseases. J. Hořejší and P. Odehnal. From the Biochemical Laboratory of the first Medical Clinic, Charles University, Prague, Czechoslovakia. Caosp. lěk. česk. 88: 1024, 1950.

The most important and characteristic features of the oxygen dissociation curve for hemoglobin in blood were reviewed.

A concise description of the technic for the determination of the oxygen dissociation curve was given.

In liver diseases the authors observed the “rightside shift” of the dissociation curve. This represents a very favorable mechanism for the oxygen supply to the tissues. The similar change of the dissociation curve was described some time ago in different anemias, especially in pernicious anemia, and in infectious diseases.

The described changes of the dissociation curve are probably caused by the changes in the hemoglobin structure, perhaps in the globin part of the hemoglobin molecule.—M.N.

Leukocytic Diseases

The authors report 5 cases of chronic agranulocytosis, 4 in women, with durations of two to ten years. All had been exposed to such factors as hair dye, lead and benzyl benzoate, and although they conceivably might have damaged bone marrow, there was no proof that this was actually the case. The course of the disease was characterized by attacks of severe infection from relatively trivial causes. The average duration of the illness in 4 survivors is now more than five years, and there is no evidence of progressive deterioration. The cases did not exhibit splenomegaly or evidence of increased blood destruction and were not thought to represent the syndrome of splenic neutropenia. One patient did not benefit from splenectomy.

Although bone marrow aspirations revealed varying degrees of cellularity, the authors feel that these cases represent variants of chronic aplastic anemia in which the main impact of the disease is on the white cells. Unlike the usual aplastic anemia, the prognosis appears relatively good, particularly with control of attacks of infection by antibiotics.


A rather dramatic clinical and hematologic response to cortisone is reported in a case of profound agranulocytosis presumably due to sulfonamide sensitivity. Although slight improvement had been detected at the time cortisone therapy was instituted, the patient’s condition was still grave and it appears that cortisone was largely responsible for the rapidity of recovery. In addition to the resultant marked neutrophilia and marrow myelocytic hyperplasia, an increase in megakaryocytes and a rise in hemoglobin were also noted.

While preliminary observations on ACTH and cortisone in some cases of aplastic anemia have not been encouraging, it is not unreasonable to suppose that these hormones may prove of therapeutic value in certain selected cases of aplastic anemia, agranulocytosis or thrombocytopenia, where spontaneous recovery is at least theoretically possible.

—H.W.B.

CIRRHOSIS OF THE LIVER FOLLOWING INFECTIOUS MONONUCLEOSIS. S. Leibowitz and H. Brady. From the Departments of Medicine and Pathology, Beth Israel Hospital, New York, N. Y. Am. J. Med. 8: 675-685, 1950.

A case is reported of a 24 year old male with infectious mononucleosis who developed cirrhosis of the liver during a three year observation period. This report is of interest in view of the recently accumulated evidence demonstrating the high incidence of hepatitis in infectious mononucleosis. It is difficult, however, to determine the relative etiologic significance of infectious mononucleosis in the development of cirrhosis in this particular patient because of the complicating nutritional and alcoholic history. The clinical features of his first illness, and later the histologic description of the liver biopsy, impress one with the etiologic importance of this latter factor and tend to delegate to infectious mononucleosis an accelerating and contributing role.—H.W.B.


Reports of autopsy findings in cases of infectious mononucleosis are rare, so much so that some cases in the past have been rejected because of the conviction that the disease was invariably nonfatal. The present case is that of a well developed man of 22, who reported at the hospital with a sore throat and who died on the thirty-eighth day of illness as a result of rupture of emphysematous bullae and sudden pneumothorax. In addition to the generalized lymphadenopathy, inflammatory tissues were also found between the pharyngeal constrictor muscles, in the hepatic portal tracts and alveolar walls of the lungs. The inflammatory tissue was largely composed of a mixture of reticulo-endothelial cells of different types, viz., large basophilic lymphoid cells, endothelial cells and plasma cells.
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The diversity of symptoms and signs, the protracted illness and long convalescence that occur in some cases of this disease, may be explained on the basis of widespread histologic change and the possible toxic effects on the parenchyma cells of the various organs.—O.P.J.


The author describes a case of a 50 year old man with typical plasmacytoma of the alphagamma type. The serum protein level was 7.5 per cent, total albumin 3 per cent, globulin 4.5 per cent. As additional rare symptoms the patient had an extrarenal nephrotic syndrome and a chronic purpura, predominantly of the lower extremities. The coagulation of the blood was completely normal. Four similar cases have been described by Waldenström (Schweiz. med. Wchnschr. 1948, p. 927), all with hyperglobulinaemia, but of different origin. It is assumed that increase of normal and abnormal globulins causes damage of the vascular endothelium with consequent purpura.—C.M.


A 22 year old white female presented clinical, peripheral blood and bone marrow manifestations suggestive of eosinophilic leukemia. These included fever, anemia, purpura, weight loss, leukocytosis of 60,000 to 100,000 per cu. mm. with 64 to 90 per cent of the cells eosinophils, marked infiltration of the marrow with eosinophils and finally death. Necropsy showed the characteristic widespread lesions of periarteritis nodosa.—G.E.C.

BLOOD COAGULATION AND HEMORRHAGIC DISEASES


The effect of a relatively new and little investigated anticoagulant, 2-phenylindanedione-1,3 (P.I.D.), on the prothrombin time of dogs and rabbits was determined and compared with that of dicumarol.

The drug was given orally. In single daily doses it proved to be a weak prothrombopenic agent but when administered in small frequent doses, it was as effective as dicumarol in prolonging the prothrombin time. A dosage of 3 mgm./kg. every eight hours increased and maintained the prothrombin time satisfactorily at two or three times the normal value. A dosage of 8.3 mg./kg. every eight hours gave prothrombin times of infinity after three days. The chief and previously reported advantage of P.I.D. over dicumarol is the more rapid fall in prothrombin time to normal (within thirty-six hours) after its withdrawal.

In general P.I.D. appears to be relatively nontoxic. The main danger as with dicumarol is hemorrhage due to overdosage, although the fact that withdrawal of P.I.D. rapidly reverses this situation gives this drug a wider margin of safety. Interestingly enough vitamin K had no effect on the increased prothrombin time produced by P.I.D. Phenylindanedione is excreted by the kidneys, and with extremely large and prolonged dosage, renal damage was noted.

The preliminary clinical note on P.I.D. by A. Blaustein in the succeeding article of this journal further confirms the potentialities of this drug. It appears to warrant wider clinical trial along with the other new anticoagulants which are now under investigation in the hope of finding a compound with the value of dicumarol and with fewer of its disadvantages.—H.W.B.

In rats under essentially comparable experimental conditions, dicoumarol decreased co-thromboplastin activity much more than prothrombin, while vitamin K deficiency produced a greater decrease in prothrombin than in co-thromboplastin.—G.E.C.

HEPARIN RESISTANCE AND HEPARIN HYPERSENSITIVITY. E. Schwarz, C. Usteri, F. Koller. From the Medical Clinic, University of Zurich, Zurich, Switzerland. Acta haematol. 4: 148–157, 1950.

Further studies on a heparin tolerance test in vivo, first described by Koller in 1943, are reported. The test is based on the thrombin-titration method of Quick. Decreased heparin sensitivity is found in cases of thrombosis, thrombophlebitis, infections with tendency to thrombosis such as pneumonia, pleural effusion, after coronary infarction and in postoperative cases. This is probably due to the occurrence of substances in the blood which inactivate heparin, perhaps in connection with an increase in the number of platelets. On the other hand, liver diseases show an increased heparin sensitivity, as well as an increased antithrombin level in the blood, and this suggests that the liver plays a part in the process of heparin inactivation.—C.M.

THE PHYSIOPATHOLOGY OF THE MAST CELLS R. Frick. From the Pathological Institute, Medical Faculty, University of Zurich, Zurich, Switzerland. Acta haematol. 4: 97–109, 1950.

A simple method is described by which the morphology of heparin storage and elimination can be followed in the mast cells and which allows at the same time a quantitative estimate of the mast cells.

Experiments with intraperitoneal heparin injection were performed in mice with the result that a new formation of mast cells started from the adventitia cells in the mesentery. The author describes how the mast cells pour out their heparin after injection of thrombokinase by eliminating their granules. The action of thrombokinase probably represents a shock effect.—C.M.

ANAPHYLACTIC REACTION FOLLOWING INJECTION OF HEPARIN. A. I. Chernoff. From the Allergy Division of the Department of Medicine and the Oscar Johnson Institute for Medical Research, Washington University School of Medicine and the Barnes Hospital, St. Louis, Mo. New England J. Med. 242: 315–319, 1950.

A case of anaphylactic reaction following an injection of heparin solution is reported. As in previous cases of such reaction following the use of heparin the exact nature of the sensitizing antigen remains obscure. Whether the response was caused by a sensitivity to heparin or the contaminating proteins in the extract could not be definitely determined. The literature concerning hypersensitivity reactions to heparin is briefly reviewed.—P.F.W.

PLASMA TRANSFUSION


HEPATITIS FOLLOWING THE USE OF IRRADIATED HUMAN PLASMA. R. N. Barnett, R. A. Fox and J. G. Snavely. From Norwalk Hospital, Norwalk; Department of Pathology, Yale University, New Haven; Stamford Hospital, Stamford, Conn.; and Northern Westchester Hospital, N. Y. J. A. M. A. 144: 226–228, 1950.
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HOMOLOGOUS SERUM JAUNDICE ASSOCIATED WITH USE OF IRRADIATED PLASMA. G. James, R. F. Korns, and A. W. Wright. From Bureau of Epidemiology and Communicable Disease Control, New York State Department of Health; and Albany Medical College, Albany, N. Y. J. A. M. A. 144: 228-229, 1950.

These three reports present a total of 18 patients in whom hepatitis followed the transfusion of irradiated plasma, and seemed to be the result of the transmission of a (viral) agent in this plasma. Jaundice appeared from 43 to 116 days after plasma transfusion in various patients. The disease was mild in almost all patients in the first and third reports; in the second report, death occurred in 2 of the 3 patients studied. In the third report, 12 instances of jaundice were found out of 20 patients who received the same batch of plasma, and it was suggested that this particular lot of plasma was at fault.

It is not clear precisely what type of ultraviolet irradiation these icterogenic plasmas received. There is some evidence that irradiation at 1849 Angstrom units may have different effects on certain properties of plasma than irradiation at 2537 Angstrom units (J.A.M.A. 143: 1037, 1950). However, it is clear that irradiation with ultraviolet light is not, at present, the final answer to the prevention of post-transfusion (viral) hepatitis.

ERRATUM

MOVITT, E. R.: Megaloblastic erythropoiesis in patients with cirrhosis of the liver. Blood 5: 468-477 (May), 1950. In figure 2, pages 471, parts (a) and (b) were reversed. The upper photomicrograph (a) actually shows bone marrow after treatment; the lower (b) shows marrow before treatment.
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