HEMATOPOIETIC TISSUES

HISTOLOGIC CHANGES OCCURRING IN THE HEMATOPOIETIC ORGANS OF ALBINO RATS AFTER SINGLE INJECTIONS


The effects of intravenous injections of sulfur mustard and nitrogen mustard vesicants on the hematopoietic organs of male albino rats were studied. In general, the results were the production of a lymphopenia in all groups of test animals, a reduction in the weight and amount of the lymphoid tissue, and a hypoplasia and hyperemia of the femoral marrow. Erythropoietic tissue was more resistant than leukopoietic tissue. Mitoses of myeloid cells were inhibited temporarily. Neutrophils on their way to maturity may have been stimulated to complete their maturation while the more immature ones were inhibited. Megakaryocytes seemed to suffer the least. As a rule, the marrow reacted more slowly to the vesicants than did the lymphoid organs.

O. P. J.

THE ACTION OF RIBONUCLEASE ON FIXED TISSUES. R. E. Stowell and A. Zorzoli. From the Department of Pathology, Washington University School of Medicine, St. Louis, Mo. Stain Technology 22: 51-61, 1947.

One of the methods used for localizing nucleoproteins within cells is to study the stainability following the specific action of the enzyme. Ribonuclease has been used by many investigators and in about as many different ways. Stowell and Zorzoli have attempted to establish the optimal conditions for the histochemical use of this enzyme. The best general fixative was found to be neutral formalin (4 percent formaldehyde). Of the five buffers tested, McIlvaine’s citric-acid-disodium-phosphate buffer at pH 7.0 was the most satisfactory. The length of incubation seemed to have a direct relationship to enzymatic action but, although the action was less active at room temperature, there was little difference between 60°, 50° and 40° C. for effective distinction of cytoplasmic staining. Even a ribonuclease concentration of 0.001 mg./ml. reduced staining considerably after prolonged incubation.

O. P. J.


Studies of isolated embryonic amphibian cells have shown them to have 4 protoplasmic layers. These are the plasmased core containing the nucleus, which is surrounded by a viscid capsule of plasmagel separated from the membrane by a shell of ectoplasmic fluid. The amphibian erythrocyte originates from a spherical amoeboid cell which has these same cytoplasmic layers. The isolated amoeboid erythroblast changes its shape several times before it reaches the final form. The first noticeable change is the “thornapple” or crenated form. Later it becomes endowed with a monaxial polarity in which it is elongated with one smooth and one corrugated side. There is considerable evidence to indicate that the outer membrane is the most important formgiving element of the cell. When freshly differentiated erythrocytes are
placed in hypotonic salt solutions they may return to their previous crenated form and even become amoeboid.

O. P. J.


A new technic for obtaining rat femoral bone marrow has been proposed. The essential steps are the dissection of the femur free from the soft tissues and the subsequent removal of marrow by means of a 20-gage syringe inserted into the bisected bone. The marrow is mixed in a drop of saline and then smeared. According to Vogel, the advantage of this method over others is that it permits the counting of consecutive cells rather than those in selected fields. Some years ago, Isaacs (Science 68: 547, 1918) developed a somewhat similar method for human sternal marrow. Instead of saline, he used serum, plasma or ascites fluid. It must be realized that in all of these methods, to obtain the best morphologic detail the preparation must be dried rapidly and that this may be prevented by having too much diluting fluid.

O. P. J.

IRON POISONING


This report of 2 fatal cases of poisoning from ingestion of a large number of medicinal tablets containing ferrous sulphate, copper sulphate, and manganous sulphate is important in view of the widespread belief that iron salts are harmless when ingested, and because of the current trend of clinical use of medicinal iron preparations containing copper and other metal salts.

Forbes reviews the literature dealing with the toxic effects of iron salts and emphasizes the fact that although reported instances of poisoning from this cause have been extremely rare, they have occurred. He also summarizes the observations relating to toxicity of copper and manganese salts, which are quite definitely toxic when ingested in moderate amounts.

The 2 fatal cases which he reports were children aged 3 years and 1 year respectively. The older child ingested 50 tablets, each of which contained ferrous sulphate 0.003 g., copper sulphate 0.0015 g. and manganous sulphate 0.0015 g. The younger child ingested 50 of these tablets. Symptoms were primarily those of profound gastrointestinal irritation and vascular collapse. Death occurred in each instance and autopsy revealed necrosis in the stomach and toxic changes in the liver.

Animal experiments indicated that death could be produced in guinea pigs and cats by administration of the same tablets, and that the large amount of iron was the toxic agent.

J. F. R.


This report re-emphasizes the hazard of ingestion of iron salts by children. One child, 16 months old, died following ingestion of 40 tablets similar to those described in the previous report by Forbes, and a second child aged 2 years was extremely ill following ingestion of 10 such tablets. The symptoms in each case were those of extreme gastric irritation and hemorrhage. The fatal case was autopsied and showed no changes except necrosis of the gastric mucosa.

J. F. R.

LEUCOCYTIC DISEASES


Three cases of leukemia are presented in which chloroma was found in various locations at post mortem examination. Chronic myelogenous leukemia and acute myelogenous leukemia and monocytic leuke-
mia were the 3 types represented. An attempt was made to define the nature of the pigment characteristic of the tumor. A small quantity of green pigment was separated which became bright green in reduction with sodium hydrosulphite and showed green fluorescence with ultra violet light. Evidence is presented from spectroscopic examination to show that the pigment resembles the reduced denatured green pigment globin cholehaemochromogen described by Lembert, Legge and Lockwood (Biochemical Journal, 1941). The possible biological mechanisms present in myelogenous and monocytic leukemia which may be responsible for the production of this pigment are discussed.

R. S. E.

INFECTIOUS MONONUCLEOSIS—COMPLICATIONS. F. S. Brien. From the Department of Medicine, Faculty of Medicine, University of Western Ontario, and the Department of Medicine, Victoria Hospital, London, Ontario. Canad. M. A. J. 36: 499-502, 1947.

In this brief review reference is made to cardiac, pulmonary, renal, hepatic, splenic and neurological complications of infectious mononucleosis. Two cases are reported in which death occurred following spontaneous rupture of the spleen. Autopsy in both cases revealed that there had been subcapsular hemorrhage, nearly complete separation of the capsule from the pulp and eventual rupture of the capsule with massive intraperitoneal hemorrhage. The principal microscopic findings at autopsy were prominent accumulations of mononuclear cells in the liver, spleen, lymph nodes and kidneys and small groups of cells in the heart muscle. Nothing of note was found in the bone marrow in either case.

L. E. Y.


The sole purpose of this paper is to report the concurrence of “Banti’s syndrome” and diabetes mellitus, which is apparently unique in the literature. The case is that of a 10 year old American man who was found to have splenomegaly, petechiae, and ecchymoses during investigation of an unrelated upper respiratory infection. Laboratory studies disclosed diabetes mellitus and pancytopenia with a hemolytic component. A bone marrow puncture was considered normal. The spleen was removed; it weighed 800 Gr. and was found to show atrophic follicles, wide sinuses, and fibrosis (“fibrocongestive splenomegaly”). Following operation there was a reduction in the requirement for insulin. As an additional complicating feature, the patient developed infectious mononucleosis a week after operation, with subsequent remission, and a return to normality.

This is an interesting coincidence of two apparently unrelated disorders. The etiology of the splenomegaly remained obscure, as it frequently does in cases of “congestive splenomegaly.”

S. E.


The hazards of thiouracil treatment are emphasized and a detailed summary of 59 reported cases of agranulocytosis resulting from medication with this drug is presented. Treatment should consist in omission of thiouracil and administration of penicillin. The author also advises pyridoxine, although evidence for its effectiveness is not completely convincing.

J. F. R.


Pyribenzamine is a pyridyl-benzol compound which has been increasingly employed in recent months for its anti-allergic action in hay fever, asthma, urticaria, and similar disorders. Reactions to pyribenzamine are unusual. The present paper reports the development of granulocytopenia (“agranulocytosis”) during a course of treatment with this drug, and apparently due to the drug itself.

The patient, a 73 year old woman with a chronic urticarial eruption of obscure etiology, was given some 150 mg. of pyribenzamine daily with marked symptomatic relief. After 8 weeks of such treatment
she suddenly developed malaise, cough, chilliness, and fever. It was found that the white count had gone from a normal level of 8,000 leukocytes (4,600 neutrophils + 3,000 lymphocytes) to a level of 1,600 leukocytes (190 neutrophils + 1,400 lymphocytes). A minimum value of 1,300 white cells, of which 3 per cent were neutrophils, was reached. There were no changes in the red cells, hemoglobin, or platelets. The patient was taken off pyribenzamine and placed on folic acid and liver therapy, with prompt symptomatic and hematologic relief.

Although subsequent attempts to demonstrate in vivo or in vitro sensitivity to pyribenzamine were unsuccessful, the thesis that the neutropenia was due to the drug is completely convincing. This report establishes pyribenzamine as one of the now numerous drugs capable of producing profound granulocytopenia in certain individuals. The mechanism of action, judging from this case, seems to depend on prolonged or large dosage, rather than to sensitivity per se (at least in certain cases), since the patient had received nearly 9 Gr. before the reaction occurred.

S. E.

Étude d'un Sérum Antileucocytaire, Mise au Point d'une Nouvelle Méthode de Titrage, Mécanisme de son Action in Vivo. (Study of an Antileucocytic Serum, a New Titration Method; Mechanism of Its Action in Vivo.)


An antileucocytic serum is obtained in rabbits by injection of guinea pig's leucocytes. This serum contains 3 types of antibodies: anti-red cell antibody, Forssmann-like antibody, and antileucocyte antibody. The titration of the antileucocytic serum is difficult, morphological changes are not reliable. The authors use the following titration: polymorphonuclears from peritoneal exudate are treated with a mixture of differing proportions of normal and antileucocytic serums on a slide to which starch particles are fixed. Normal serum is necessary in order to supply fresh complement. Antileucocytic serum in dilutions below 1/20 inhibits leucocytic chemiotactism and starch particles are no longer surrounded by leucocyte collars. Furthermore in test tubes an agglutination of leucocytes is observed. In vivo, the intraperitoneal injection provokes a severe intoxication with leucopenia and no in situ response when staphylococci are injected subcutaneously. By different experiments (selective absorption) the authors show that the in vivo reaction is not due to the anti-red cell antibody, and not to a Forssmann antibody, but is the result of the antileucocytic antibodies. These antibodies do not destroy the leucocytes but interfere with the chemiotactism of these cells, although not by direct inhibition. (Leucocytes from an injected animal behave in vitro as normal cells toward starch.) It is rather a perturbation of the diapedesis due to a capillary injury.

J. P. S.


The authors discuss the clinical and pathologic features of a syndrome which has been variously designated by several descriptive titles, and the significant features of which are exemplified by 3 cases reported in this communication. The clinical manifestations of the disease, most consistently observed, include the gradual, protracted development of splenomegaly, anemia and general debility. Evidences of erythrocyte and myeloid immaturity are occasionally encountered in the peripheral blood, but these changes are usually not regarded as typically leukemic, and leukemoid features may be altogether absent. The morphologic findings in the authors' cases are interpreted as being consistent with a form of myelogenous leukemia, which, although not uncommon, has often been misrepresented and its true leukemoid character obscured in the literature on the basis of questionable criteria. These criteria, including the non-leukemic character of the blood, incomplete myeloid conversion of the spleen, absence of splenic infarction, megakaryocyte hyperplasia in the spleen and marrow, myelofibrosis and osteosclerosis, are critically analyzed.

C. P. E.