ABSTRACTS

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ERYTHROCYTES


The mechanism of biologic transport for electrolytes, non-electrolytes and water have been studied thoroughly in the intact erythrocytes. Since permeability processes are very complicated, it was thought to be advantageous to attempt some investigations on hemolyzed erythrocytes or “ghosts.” Untreated ghost cells behave as almost perfect osmometers. The K and Na ions exhibit a slow diffusion, while water is rapidly transferred across the ghost membrane in such a direction as to secure continuous isotonicity with the external medium. Treatment of the ghosts with minute amounts of lysin (Na oleate) induces a rapid action exchange across the membrane, which seems to follow simple diffusion laws. Various miscellaneous observations were also made on the permeability to some other substances like glucose, sucrose, etc., and on the shape transformation of the ghosts.—O.P.J.


The respiratory characteristics of blood from kangaroo rat were investigated because of the low pulmonary water loss found in the animal which might be explained by a hypothetical low ventilation of the lungs and a higher utilization of the alveolar oxygen. The results do not support this hypothesis, but show that the respiratory characteristics of the kangaroo rat blood are similar to those of the blood of white rats.—O.P.J.

FOLIC ACID METABOLISM


Since the specific morphologic pathology of sprue, not related to pancreatic insufficiency, is fragmentary and conflicting, it was thought that animal experimentation might contribute to the knowledge of the pathogenesis of this disease. Five groups of albino rats were treated as follows: (1) controls fed commercial food and water ad libitum; (2) test rats fed the same diet plus a daily dose of 25 μg. aminopterin administered orally in aqueous solution by catheter; (3) test rats fed the same diet plus a single oral dose of 100 μg. aminopterin; (4) test rats kept without food; and (5) test rats kept without water.

The aminopterin treated animals showed at autopsy: severe anemia, dehydration of muscles and subcutaneous tissues, greatly shrunken spleen, thymus and lymph nodes. Lesions in the gastro-intestinal tract occurred in the following order: (1) ileum and duodenum, (2) colon and (3) esophagus. The earliest changes were noted in the bone marrow, usually on the second day, but in the animals which received the large dose of antagonist, alterations were observed in 24 hours. There was a sharp decrease in mature granulocytes, followed by an absolute increase in the number of stem-cells and decrease in normoblasts.
The mean cell diameter of the stem-cells was increased 40 to 60 per cent. Their nuclear detail became indistinct; their cytoplasm increased in amount and stained more lightly than normal. Finally most of the cellular elements of the marrow disappeared, leaving an occasional erythroblast, a few lymphocytes and prominent reticulo-endothelial cells. The starved and dehydrated animals failed to show any of these lesions.—O.P.J.

LEUKOCYTES and LEUKOCYTIC DISEASE


In a 2 year old girl brought for examination because of epilepsy, the author detected a round eccentric nucleus with a very coarse and fragmented chromatin structure in 94 per cent of the neutrophile granulocytes. Further investigation revealed both parents as possessing the heterozygous form of the Pelger-Huët anomaly. The described case is the first seen in man and resembles closely those produced experimentally in rabbits.—C.M.


The peripheral blood lymphocyte counts in several groups of cases are compared. The control series are not comparable in age distribution to the others. The data are interpreted as indicating a large percentage of individuals with myocardial infarction, decompensated rheumatic heart disease or hypertension will have a lymphocytopenia. It is suggested that when such a peripheral blood picture is seen in some other clinical states a circulatory insufficiency may be a factor in its production.—P.F.W.

PERIODIC NEUTROPENIA TREATED BY ADRENOCORTICOTROPHIC HORMONE AND SPLENECTOMY.


The clinical course of a 78 year old patient with neutropenia and periodic episodes of fever, arthralgia, benign peritonitis and oral ulcers is described. Although the patient improved symptomatically and clinically following ACTH therapy the recorded observations on the peripheral blood were not impressive. However, the bone marrow reputedly became hyperplastic. Following splenectomy there was only a transient rise in the neutrophilic granulocytes. Symptomatic improvement for one year followed the operative procedure.—P.F.W.


The case report of a 27 month old child with the clinical syndrome of long persistent eosinophilia, leukocytosis and hyperglobulinemia, previously described by Zuelzer and Apt (Am. J. Dis. Chirld., 78: 153, 1949), is presented because of the interesting additional finding of an elevated heterophil-agglutination titer. The heterophile antibodies, like those found in serum sickness, were absorbed by both guinea-pig kidney emulsion and boiled-beef red blood cells.—H.W.B.

EXPERIMENTAL CONTRIBUTION TO THE QUESTION OF HYPERSPLENIC PANAEMOCYTOPENIA.


A saline extract of the spleen of a patient with hyperplenemic panhemocytopenia injected into a rabbit produced similar alteration in the blood and bone marrow. The same experiment with the extract of the spleen from a patient with hereditary spherocytosis did not show comparable reaction. The humoral transmissibility of hyperplenemic panhemocytopenia is thus proven. The difference to other forms of splenic diseases is discussed.—C.M.
SEQUENCE OF CELLULAR RESPONSES TO INJURY IN MICE EXPOSED TO 1,000 R. TOTAL-BODY X-RADIATION. J. Barrow and J. L. Tullis. From Naval Medical Research Institute, Bethesda, Md. Arch. Path. 53: 391-407, 1952.

Studies on total-body exposure to ionizing radiation are very important today because of the several modern sources of such radiation, namely, explosion of atomic bombs, the cyclotron, the atomic pile and the industrial x-ray tube. In order to obtain accurate information on the sequence of pathologic events at short intervals following irradiation, a large group of white adult male mice were studied after exposure to an absolute lethal dose of 1,100 r. Ten mice were used as controls and 10 were killed every hour following irradiation for 88 hours. The mice were killed with carbon dioxide and autopsied immediately. Sections of lymph nodes, spleen, bone marrow, testis, small and large intestines, lungs and liver were studied. The chief observations were (1) the relative uniformity of response of lymphoid tissue regardless of its location, (2) the morphologic and functional evidence of radioresistance of the reticulo-endothelial cells, (3) the lack of degenerative changes in plasmae and their apparent increase and (4) the definite increase in erythrocytophagia. The latter was found in the spleen and bone marrow and to a lesser extent in the lymph nodules. It has been suggested that erythrocytophagia is one of the mechanisms contributing to the anemia of radiation illness.—O.P.J.

TECHNICAL PROCEDURES


Among 40 patients showing persistently positive guaiac stool tests there were 3 who, despite "normal" barium-enema examinations, showed at exploration large bowel cancer. This emphasizes the very important point that when a large bowel lesion is suspected from clinical findings a "normal" barium-enema examination report should be accepted with skepticism.—P.F.W.

THE HAEMOPRUSIN TEST IN VITRO. W. Baumgartner and M. Miller. From the Medical Department of the Hospital in Interlaken, Switzerland. Helvet. med. acta 19: 66-70, 1952.

Until now, we have been able to recognize agglutinins, glutinins and hemolysins by in vitro examination. The author describes a simple method for clinical purposes which allows the additional demonstration of the opsonin action. The proceeding attains a medium with enrichment of living leukocytes in relation to the erythrocytes. After adding the serum to be proved, the phagocytosis of the sensitized erythrocytes may be demonstrated in stained smears.—C.M.