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ERYTHROCYTES


In 100 hospitalized older patients with iron-deficiency anemia, the MCHC varied with the degree of anemia, but the degree of poikilocytosis and cell size did not; in 21 patients, MCV's were normal or above. Nucleated red cells were seen on the blood smears of 22 patients. Platelet counts often were considerably increased. Diameters of primitive bone marrow erythroblasts were smaller than those of normals. Chronic, occult bleeding from the gastrointestinal tract was the usual cause of iron loss. More than 12 different gastrointestinal lesions were found and no one type predominated. In 21 patients, no source of blood loss could be found.—R. O. W.


Mice rendered polycythemic by intermittent hypoxia were used to measure plasma and urinary erythropoietin levels in 2 patients with Cooley's anemia. The accuracy and applicability of measuring erythropoietin in this manner were emphasized. Erythropoietin in plasma of normal subjects may be a measurable quantity and would indicate that erythropoietin participates in normal regulation of erythropoiesis, as well as under conditions of severe hypoxia.—A. J. E.


Early reports had suggested that guinea pigs behaved differently from other small animals by not responding to erythropoietin, a peculiarity which had led to much idle speculation. The authors present solid data on hypertransfused guinea pigs, showing that these animals respond in very much the same way as other rodents.—A. J. E.


Intravenous injection of 100 mg. per Kg. on 2 consecutive days led to an increase in reticulocytes and bone marrow erythroblasts. After ex-
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including a hemolytic action of putrescine, a direct stimulatory effect of diaminos on erythropoiesis was postulated and its possible relationship to cell differentiation by derepressor mechanisms was discussed.—E. K.


In 16 of 18 males with mild deficiency, 2 red cell populations could be easily distinguished; the proportion of normal cells varied from 20-95 per cent. In 2 cases, all red cells appeared normal, despite lowered G-6-PD activity in hemolysates. The authors felt that the presence of 2 red cell populations in mildly deficient males cannot be explained on the same basis as that in female heterozygotes. They suggested that the findings represent the end result of variation in G-6-PD activity related to red cell aging and that the cyanmethemoglobin-elution technic may not be suitable for demonstration of 2 genetically different red cell populations in females heterozygous for G-6-PD deficiency.—P. B.


The level of AMP, ADP and ATP was measured in RBC of 20 subjects with cirrhosis. ATP was significantly decreased in 11 with uncompensated cirrhosis and a significant correlation was observed between increase of ATP content and severity of anemia. The possible mechanism was discussed.—G. M.


The synthesis of glutathione from direct precursors under anaerobic conditions in the presence of ATP was confirmed. Stroma alone possessed the same ability. Intact erythrocytes synthesized glutathione not only from direct precursors, but also when α-ketoglutaric acid replaced glutamic acid and when methionine and serine were present instead of cysteine. Washed stroma could not synthesize GSH from the indirect precursors.—E. K.


In isolated form and in the presence of 3-5 M urea at pH 6-7, only β-chains formed insoluble complexes with zinc ions. In mixtures of chains, their mutual linkages considerably modified their behavior. A strong mutual affinity of two types of chains was also deduced from their coprecipitation. At equimolar ratios, the complexes were quite insoluble at pH 5.37, but they dissolved when one of the two chains was present in excess. The behavior of mixtures of separated chains favored the concept of symmetrical cleavage. Marked differences between the behavior of globin and that of experimentally prepared mixtures of 50 per cent α- and 50 per cent β-chains, in the presence of urea and zinc ions, proved that conformations of isolated chains were different from those in the original globin.—E. K.


In oxyhemoglobin solutions in dilute buffers exposed to atmospheric oxygen, mercury accelerated the splitting of hemoglobin at pH 4.0 and its autoxidation at pH 4.5, increasing the rate constants by about one order of magnitude. It was proposed that a labile vinyl-sulfhydryl bond in oxyhemoglobin strengthens the heme-globin linkage and increases the stability of divalent iron.—E. K.


Proteins were precipitated from lysates with Rivanol and were extracted with 0.5 M KCl. On starch-gel electrophoresis, 13 nonhemoglobin fractions were obtained.—E. K.
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Although it has long been known that red cells under certain conditions may give rise to bizarre forms, electron microscopy has been confined to replication with shadow casting. Negative staining was used to study the ultrastructure of these labile forms. Many cells had long cylindrical tubes from 200Å to 1μ in diameter and several microns long. The tubes, bounded by a membrane 40-60Å in width, were relatively impermeable to phosphotungstic acid and showed no periodic structure. These structures were not strictly identical with myelin figures and probably contained a high percentage of hemoglobin.—O. P. J.


The electrophoretic behavior on cellulose acetate of hemoglobins from chick embryos (5 days to hatching) are reported. There are 2 readily detectable hemoglobins in the earliest stage studied and 3 in the 7-day and all older embryos. The 2 found in the 5-day embryo are the same as 2 of those in older embryos. Percentages of the various hemoglobin forms are given.—O. P. J.


Light and electron microscopic observations of erythrocytes of several nonmammalian vertebrate classes showed that marginal bands are composed of tubular elements which vary in diameter from 200Å to 500Å. The number of tubular elements is constant among cells from the same species. These bands appear at the equator of the cells and it is possible that, during development, these bands are involved in determining initial biconvexity, after which they become residual structures.—O. P. J.


Areas of attachment between epithelial cells have long been known as nodes of Bizzozero or desmosomes. In the avian yolk sac, zones of attachment similar to desmosomes have been observed in developing red cells.—O. P. J.


Studies were made with light and electron microscopes on the structure of clusters of granular and vacuolar bodies in the cytoplasm of erythrocytes of newts. The fine structure of these bodies and the demonstration that they contain acid phosphatase indicated that they are cytolysomes (Novikoff). These structures may be involved in degradation of organelles during normal maturation of erythrocytes.—O. P. J.

LEUKOCYTES


Decreased values were observed in 47 cases, especially in chronic leukemia. The results obtained could not be explained by the metabolic schemes of Warburg.—F. D. N.


This reduction is explained by the immune reaction of graft versus virus. The injection of plasma from untreated animals induces 100 per cent leukemia, but the rate decreases to 80 per cent when plasma from treated animals is used.—G. M.

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Materials for these studies included cells of avian myeloblastic leukemia, the ascites form of Moloney leukemia, Rauscher leukemia, and some human leukemias. Glutaraldehyde was found to be good for routine electron microscopy, revealing structures not seen after osmium tetroxide fixation alone. The overall diameter of microtubules varied from 180Å to 250Å. Their length was undetermined, but could be traced for several microns in some sections. Whether these microtubules are only rudiments of mitotic fibers having no role during interphase or if they play an active role in determining the shape of cells is unknown.—O. P. J.


A considerable diminution was observed in 16 cases. Values were even lower than in adults who have less resistant leukocytes than newborn infants.—P. D. N.


Abnormal karyotypes were observed in 70 per cent of lymphocytes of 6 patients. Deletion of chromosomal material was most frequent and cellular polyploidism was less frequent.—P. D. N.


Two leukocytes containing colchicine metaphase figures are compared. Even at lower magnification, structures are visible in the electron picture that are absent or obscured in the optical one. At higher magnification, it is clear that electron micrographs show alternating light and dark regions along the chromotids. These structures probably represent an inhomogeneity in the chemical composition of the chromosomes, rather than an artefact.—O. P. J.


A simple and almost invariably successful method for culture of lymphocytes from blood, thoracic duct or thymus was described. The problem of how many small lymphocytes could be stimulated to respond to phytohemagglutinin remains unsolved. Some small lymphocytes may be more responsive than others. The present study confirmed the report by Hungerford and Nowell ('63) that, in Lewis rats, X chromosomes have subterminal centomeres, Y chromosomes are telocentric and larger than pair 13, and that pair 3 appears to have satellites.—O. P. J.


Leukocyte-rich plasma was planted in a medium consisting of NCTC 109, F 10, fetal bovine serum, human cord serum and phytohemagglutinin. Incubation was followed by colchicine, hypotonic treatment with water and fixation in absolute methanol-glacial acetic acid. Cresyl violet acetate gave a strong chromosome stain.—O. P. J.

ON ALKALINE PHOSPHATASE ACTIVITY OF NEUTROPHILIC GRANULOCYTES WITH PELGER-HUET ANOMALY IN RABBITS. I. Urasiński and A. Urasieńska. From 2 Medical Clinic Medical School, Kraków, Poland. Pat. Pol. 15:233, 1964.

The number of phosphatase-positive granulocytes in rabbits heterozygous for Pelger-Huet anomaly was the same as in normal rabbits. The index of activity was slightly lower in Pelger-Huet rabbits.—E. K.

HEMOSTASIS

OBSERVATIONS ON THE BEHAVIOR OF BLOOD COAGULATION IN PULMONARY TUBERCULOSIS WITH RESPECT TO AGE AND ANATOMICAL-CLINICAL TYPE. F. Tigano, F. La Rosa and G. Biondo. From the University, Messina, Italy. Riforma Med. 5:3, 1964.

In 185 patients, the most marked reduction in coagulability was observed in acute forms, followed by the chronic cases and those with cavern-
Increased fibrinogen formation in the presence of excess thromboplastic activity. Defective thromboplastin platelets at normal concentrations exhibit normal hemorrhagic thrombocytopenia.


Increased fibrinolytic activity was observed in 9 of 13 cases. A release of tissue activator was considered to be the cause. Cases of malignant erythema, dermatomyositis, scleroderma and rheumatoid arthritis were considered.—P. D. N.


After administration of 100 Gm. butter, a shortening of prothrombin and recalciﬁcation times, an increase in heparin tolerance and serum accelerating activity, and inhibition of fibrinolysis were observed.—P. D. N.


Besides the familiar drop in platelets in dogs given 600 r. total body dose, increased fibrinogen level and Factor V and VII activity were observed. The increase could be explained by decreased fibrinolytic activity due to increased antiplasmin titer. These ﬁndings which were in accord with the rare experiences in human radiation sickness, were interpreted as compensatory reactions to counteract partly the bleeding tendency.—E. K.


Studies in 3 cases have shown that patients' platelets at normal concentrations exhibit normal thromboplastic activity. Defective thromboplastin formation in the presence of excess thrombocy-themic platelets can be corrected by addition of normal adsorbed plasma or a Factor V preparation. The authors consider the possibility that an altered ratio between plasma and platelet thromboplastic factors is the cause of the coagulation defect. Some data seem to indicate that the permeability of the platelet membrane is increased, thereby releasing platelet-like thromboplastic activity into platelet-free plasma.—P. D. N.


The authors proposed a new test for investigation of hemostasis which involves measurement of release of platelet aggregating activity (mostly ADP) by addition of thrombin to platelet-rich plasma. The consumption of this activity after 1 hour of incubation was determined. The results were normal for Von Willebrand patients, but in hemophilia and thrombasthenia, consumption was faster than normal. In chronic myeloid leukemia, platelet aggregating-activity release was diminished and consumption rapid. Connective tissue could also be used for study of the release phenomenon.—J. C.


In a turbidimetric micromethod, 50 mm³ of platelet suspension were mixed with 15 mm³ of NaCl solutions of different concentrations (0.9, 0.75, 0.60, 0.45, 0.30, 0.22 per cent). The microscopic reading was made through cylindrical cuvettes (5 mm. diameter and 5 mm. height) at 650 μm and percent lysis was determined. In 30 normals, platelet lysis began at 0.75 per cent and was complete at 0.22 per cent. In 2 of 15 cirrhotic patients, increased osmotic resistance was noted. In 1 of 10 patients treated with tromexan, diminished osmotic resistance was seen and a similar diminution was observed in 1 of 4 given heparin. In 7 cases of leukemia, only 1 had diminished osmotic resistance.—M. J.

Isolation and Characterization of Cold-Insoluble Fibrinogen Complex from Bovine Plasma. B. Łopiński, A. Z. Budzyński, Z. S. Latello and E. Kowalski. From Institute of Nu-

During preparation of bovine fibrinogen by a modified Kekwick method, two protein preparations were obtained which clotted under the action of thrombin. They differed from fibrinogen by being insoluble in the cold. The complexes were composed of fibrinogen, fibrin and fibrinogen degradation products. Similar complexes may be formed in vivo both in physiologic and pathologic states.—E. K.

MISCELLANEOUS


This interesting paper records the histories of 6 children in whom bone marrow hypoplasia and pancreatic insufficiency appeared to be related. Pancreatic insufficiency was not part of generalized cystic fibrosis, since none had chronic respiratory disease and sweat electrolytes were normal. Bone marrow hypoplasia was reflected primarily in neutropenia, but there were occasional episodes of thrombocytopenia and, even more interestingly, of increased fetal hemoglobin in children 2 years and older and in children without any history of hereditary hemoglobin abnormalities. Despite bone marrow hypoplasia and increased fetal hemoglobin, there was no consistent suppression in red cell formation. The authors felt that this combination represents a syndrome, probably familial, and that its elucidation may lead to a better understanding of the function of these two organs. Since the disease appears to have a much better prognosis than cystic fibrosis, it would seem important to re-evaluate cases of cystic fibrosis without sweat abnormalities and to examine them for bone marrow dysfunction, especially neutropenia.—A. J. E.


The described technic results in smears with 3 distinct concentric zones: a central zone of myeloid elements only, an outer zone with a mixture of blood and marrow, and a middle zone of erythropoietic and myeloid tissues in the inner part of which a large number of megakaryocytes may be seen.—O. P. J.


The present study was undertaken because of the popularity of Wright’s stain and the unsatisfactory results obtained in its application to avian hematology. The technic, (Wright’s stain, buffered solution of formalin and an equal parts mixture of ether and absolute methyl alcohol) gave results comparable to those obtained with more elaborate technics.—O. P. J.


Bloodletting from the ophthalmic plexus in the mouse has become an increasingly popular method of obtaining small samples and it appears that this plexus also can be used for injections. The authors give instructions and results when used in mice, hamsters, rats and guinea pigs.—A. J. E.


The frequency of salivary AB group isoantibodies, tested with trypsinized erythrocytes, was 20 per cent higher in pregnant women than in controls. This figure was correlated with the expected frequency of ABO group incompatibility. Selective appearance in saliva of group O mothers of isoagglutinins for the child’s blood group may be an additional diagnostic sign of neonatal hemolytic disease due to ABO incompatibility.—E. K.


Previous studies have indicated that tolerance to certain protein antigens could be terminated by
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injection of cross-reacting proteins. Since artificially acquired tolerance may be produced by a mechanism similar or identical to natural tolerance of self-antigens, it was postulated that an alteration of normal self component (in the present case thyroglobulin) would produce an abrogation of self tolerance or autoimmune disease. Thyroglobulin was altered by coupling to chemical haptens or by heating. With some of these altered thyroglobulins, antibodies to both the altered protein and native thyroglobulin were produced, as well as thyroid lesions. Injection of native thyroglobulin under the same conditions, on rare occasions, minimal amounts of antibody. The author felt that these data support the “alteration of self components pathogenesis” of certain human autoimmune diseases.—I. G.


A reinvestigation of the influence of a genetically alien uterine environment on the immunological responsiveness of offspring. The assay method was survival of BN rat skin on Lewis rats. In one case, young Lewis rats were derived from Lewis mothers. In the other, young Lewis rats were derived from Lewis ovaries developing in Lewis x BN, F1 animals. Thus, the developing Lewis rats in the F1 mother could be exposed to BN transplantation isoa antigens. Contrary to expectation, BN skin grafts on potentially BN exposed Lewis rats had a shorter survival time than BN grafts on ordinary Lewis rats. This study indicated that maternal cells, or at least isoa antigens, can reach the fetus and that in this case they produced sensitization rather than tolerance to maternal isoa antigens.—I. G.


Thymic cells are 1/100 as reactive immunologically as are the same quantity of lymph node cells. The reason for the difference is the lack of clear centers with histiocytes in thymus with lack of mobile macrophages. This experiment confirms the hypothesis by showing that introduction of macrophages in a population of thymocytes markedly increases immune reactivity.—G. M.

STUDIES ON ACQUIRED TOLERANCE TO HUMAN ERYTHROCYTES IN RABBITS. G. Woźniacko-Orlowska. From the Medical School, Zabrze, Poland. Acta Physiol. Pol. 15:403, 1964.

Immediately after birth, 34 rabbits were injected with human blood and 18 served as controls. Six weeks after birth, all rabbits were immunized with human blood and serum antititers were determined. The findings appeared to indicate acquired tolerance to human erythrocyte species antigen, but not to group antigens.—E. K.


The authors found differences between normal and carcinogenic cells from the same origin: absence of aggregation for normal, solid cohesion for carcinogenic. The more malignant the cells the more they would aggregate one to another. The authors believed that this discovery is a fundamental step in the study of carcinogenesis.—J. C.


Labeled thymidine was injected into a limb cut off from the general circulation by tourniquet. Several hours after release, labeled cells were found in bone marrow and in other sites. This result was seen in mice with local aplasia due to irradiation and in normal animals, suggesting migration of marrow hematopoietic cells.—G. M.