ABSTRACTS

Theodore H. Spaet, M.D., Editor

ABSTRACTS OF SPECIAL INTEREST


Polymorphonuclear leukocytes obtained from guinea pig peritoneal exudates were incubated with starch particles in the presence of a phosphate-P solution. The leukocytic phosphatides were extracted with chloroform-methanol and then separated by chromatography on silicic acid columns. It was found that phagocytosis caused a large increase in the specific activity of leukocyte phosphatidylserine, a moderate increase in the specific activities of phosphatidyl ethanolamine, lecithin, and sphingomyelin. The pattern of stimulation of labeling of phosphatides during phagocytosis is strongly reminiscent of the patterns obtained for a large number of secreting tissues when these are stimulated with acetylcholine.—T. E. B.

HEMOSTASIS


(1) After the batch test, chromatography with DEAE-cellulose was carried out as follows: Prothrombin purified by the method of Ware and Seegers was adsorbed onto the column with 0.005M phosphate buffer (pH 7.0) and eluted with 0.05M phosphate buffer (pH 5.4)-0.4M sodium chloride by the gradient method. (2) Some properties of DEAE-cellulose-treated prothrombin were discussed. (3) In the chromatographic pattern of purified prothrombin contaminated with a trace of thrombin, it was found that a sharp protein peak having neither prothrombin nor thrombin activity was a prothrombin derivative, which easily converted into thrombin by autocatalytic activation in a citrate solution. (4) DEAE-cellulose chromatography was applied to the study of the conversion mechanism by physiologic activation of prothrombin into thrombin.—K. F.


Rabbits were subjected to an electric stress (20 mA), and blood coagulation studies were carried out before and 30 minutes afterwards. A short-
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Thrombolastographie activity in platelets varied between a minimum of 2910 and a maximum of 4290 μM of fructose-6-phosphate from 1 Gm.

Phosphohexoseisomerase activity in platelets varied between a minimum of 2910 and a maximum of 4290 μM of fructose-6-phosphate from 1 Gm. of platelets in one hour. In the first and second years of age, the values are considerably higher than at a later age in erythrocytes and plasma; in platelets no significant variations were observed.—P. d. N.


An anti-clearing factor activity was detected in normal human platelets and identified as platelet factor 4.—P. d. N.


Previous splenectomy did not alter the course of thrombocytopenia in guinea pigs administered anti-platelet serum for prolonged periods. There was, however, some protection against the lethal action of antiserum, the splenectomized animals living twice as long as the unsplenectomized ones.—J. B. C.


Platelets were separated by centrifuging in 2 ml. 6 per cent Dextran (MW 190.000) /1.2 ml. 3 per cent EDTA in saline, Cr51-labeled, injected, and the remaining radioactivity in the blood counted after re-separation of the platelets. A normal life span (8–10 days) was found in bone-marrow hypoplasia of various origins. All other thrombocytopenias had shortened life spans.—P. G. R.

A single meal of cream caused a decrease of fibrinolysis in patients with coronary artery disease. Cod liver oil induced no effect, soybean oil showed fibrinolytic activating properties greater in atherosclerotics than in normal cases. From the above observations an impaired adaptability of the fibrinolytic system in atherosclerotics was assumed. The influence of fats on fibrinolysis appears during lipemia. A marked statistical difference in fibrinolysis times exists between atherosclerotics and healthy people.


Fibrinolysis was studied in 69 normal subjects, in 294 persons with various blood diseases, 20 cancerous patients and 19 patients with liver cirrhosis. Inhibition of fibrinolysis was found in lymphogranulomatosis and in patients with advanced cancer. Increased fibrinolysis was found in single cases, and more often in liver cirrhosis. Manifest hemorrhagic diathesis, increased fragility of the blood vessels with changes in the serum protein pattern were frequently observed in patients with increased fibrinolysis. Prolongation of the plasma thrombin time in patients with increased fibrinolysis seems to be characteristic and of diagnostic value.

ERYTHROCYTES


Two hundred and seventy-three samples of cord blood and 302 samples of venous blood from infants and children were examined by the method of Singer. In cord blood, average content of Hb.F was 58 per cent. The content fell rapidly after birth to 9 per cent at 4, 4 per cent at 12, and 2 per cent at 18 and 24 months.


Sixty-five infants were studied at birth, one week, and 4-8 weeks after birth. The hematologic values of infants born of anemic mothers did not differ from those of normal mothers. A statistically significant negative correlation was observed between the severity of anemia in the mother and the hematologic values in the infant.


This paper briefly describes the findings in 26 Negro infants in whom sickle cell anemia became manifest between 3 months and 2 years of age. The liver was often palpable, and in 9 of the infants it extended more than 2 cm. below the right costal margin. The spleen was palpable in 15 of the 26 infants. Beyond 6 months of age, anemia was a consistent finding and except for times of crisis, the hemoglobin ranged between 7 and 9 Gm. per 100 ml. In 4 infants with pronounced splenomegaly, platelet counts were below 85,000 per mm³. Osteopathy of the hands or feet was a very frequent finding. These crises were characterized by swelling, warmth, and extreme tenderness, usually over the metacarpals or proximal phalanges, and frequently accompanied by fever. Radiologic evaluation 2 to 3 weeks following the onset of symptoms often revealed periosteal reactions with underlying medullary rarefaction. From the authors' observations it would appear that sickle cell anemia may become manifest before the age of 2 years with much greater frequency than has heretofore been acknowledged.


A report on 12 cases of varying severity, all belonging to the Mahar Caste.


In Hb. E-thalassemia disease, the rate of plasma clearance of injected radioiron was increased, but utilization of iron by erythrocytes was decreased. The clearance pattern resembled that of iron deficiency anemia whereas the radioiron uptake pattern was similar to that recorded in aplastic anemia.

—J. B. C.
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In Hb. E-thalassemia disease, the mean effective Cr"51 half-life was markedly reduced, the values ranging from 3 to 20 days as against 38 to 49 days in normal subjects. The degree of anemia could not, however, be explained on the basis of erythrocyte life span. Radioidine studies indicated erythropoiesis was largely ineffective.—J. B. C.


Two groups are presented in detail. The first group consists of 3 cases of Hb. S-thalassemia, one of which is in a caste Hindu. The second group consists of 3 cases of Hb. E-thalassemia in a Muslim family. Other syndromes seen in Bombay include association of thalassemia with Hb.D, Hb.J and high fetal trait.—J. B. C.


The authors have estimated the rate of metabolism by way of the pentose phosphate pathway by measuring the production of CO₂ from glucose labeled with C¹⁴ in the 1 position. In addition to confirming the stimulatory effect of methylene blue on this pathway, stimulation was demonstrated when cysteine, ascorbic acid, acetylphenylhydrazone, primaquine phosphate, and several other compounds were tested. In the presence of a spinach diaphorase, it was possible to demonstrate that nitrofurantoin and alphanaphthol stimulated TPNH oxidation. It is suggested that increased oxidation of TPNH in the presence of drugs may be an important factor in sensitive red cell destruction by drugs such as primaquine. Choleglobin formation in the presence of ascorbic acid could not be inhibited by the addition of GSH to the system, but was inhibited by the addition of either TPN or TPNH. These findings, in human erythrocytes, are in contrast to those reported earlier in rat red cells by Mills and Randall.—E. B.


Observations were performed during the preservation of blood in ACD solution at 2, 4, 20 and 37 C. and the following results were obtained: 1. If ATP content in red cells is over a certain level (about 50 per cent of the original level), the normal shape of the cells is maintained; if it is below this level, the shape becomes crenated; when it decreases to below about 10 per cent, spherocytosis occurs. 2. The presence of plasma protein is not necessary for the red cells to maintain their discoidal shape. Therefore, the presence of antispiking factor in plasma was excluded. 3. Some workers have reported that change of pH and ionic strength causes a similar transformation. In this experiment, however, ATP level gives rise to the disk-sphere and also spherical shape-disk transformation of red cells, whereas pH, cation concentration, and ionic strength remained unchanged. 4. The maintenance of the shape of the red cells may depend not on the turnover of ATP, but on the level of ATP, because the cell shape remained quite unaffected by temperature change alone.—K. F.


A four month old female infant of Oriental Jewish parenthood developed severe anemia and jaundice. The infant was being nursed by her mother, and on the day prior to the onset of symptoms, the mother ate fava beans. Four days later, when the infant was hospitalized the red blood count was 1 million, and the urine was dark, with an increased urobilinogen content. The following day, after a transfusion of 150 ml. of whole blood, the hemoglobin was 5.7 Gm. per cent, the WBC was 25,000 with a marked shift to the left, and the reticulocyte count was 8.8 per cent. The total serum bilirubin was 4.3 mg. per cent, mostly indirect-reacting. The Coombs' Test was negative. Erythrocyte GSH levels were determined in the infant and her parents, before and after incubation with acetylphenylhydrazone. The mother and infant demonstrated marked glutathione instability, and the father's red cells showed an "intermediate" degree of instability. Although insufficient data are available to determine the genetic pattern in this family, it seems quite likely that this female infant with glutathione instability...
developed a severe hemolytic episode following ingestion of her mother’s breast milk shortly after maternal ingestion of fava beans. Interestingly, although fava beans were a regular part of the family diet, neither parent had ever noted any untoward effects of their ingestion.—J. B. S.


The findings were: (1) Decrease in activity of cytochrome oxidase in whole homogenate and rat liver preparation during severe anemia; (2) Decrease in activity of the whole succinic oxidase system with succinic dehydrogenase activity unchanged; (3) No change of activity of examined enzymes in whole homogenate and rat heart preparation; (4) Four weeks iron administration caused hemoglobin remission to the normal level, increased the activity of succinic oxidase up to normal values, and gave an increase in the activity of cytochrome oxidase exceeding the activity of this enzyme in control animals.—E. K.


Vitamin B₁₂-deficient newborn rats have a quantitative decrease in liver nonprotein sulfhydryl compounds and a proportional increase in nonprotein disulphide. This is also true in rat (Biochem. J. 72:389, 1959) and human (Biochem. J. 72:11 p, 1959) B₁₂-deficient erythrocytes, but seems not to be markedly so in folic acid-deficient rat erythrocytes (Biochem. J. 72:389, 1959). These findings suggest the possibility that a deficiency of reduced glutathione may play a role in the hemolytic aspect of megaloblastic anemia due to vitamin B₁₂ deficiency.—V. H.


The dependence of vitamin B₁₂ deficiency on the amount of vitamin B₁₂ excreted with urine was investigated by means of a simple technic consisting of intramuscular administration of radioactive vitamin and then estimation of urine radioactivity. The investigations were carried on 19 healthy subjects, 10 patients with vitamin B₁₂ deficiency, and in 24 individuals with different diseases. The results obtained indicate that mean values of vitamin B₁₂ excretion after intramuscular injection of 20 µg. of B₁₂ are distinctly lower in individuals with vitamin B₁₂ deficiency than in healthy individuals. Marked decrease of vitamin B₁₂ excretion was demonstrated in renal disorders, showing the necessity of considering renal function when doing the Schilling test.—E. K.


Low folic acid activity for L. casei (but not for S. faecalis or L. citrovorum) was found in whole blood and serum of 35 of a group of 64 pregnant women with anemia. Associated low serum iron and vitamin B₁₂ levels were frequently present. This is the third similar publication by these authors, presenting results using unreported methodology, which hopefully will be forthcoming shortly.—V. H.


Horse hemoglobin was irradiated by x-ray, and the ethyl-isocyanide (EIC) binding reaction of irradiated hemoglobin was investigated. 1. From the EIC equilibrium, it was demonstrated that the heme-heme interaction and the Bohr effect of hemoglobin decreased remarkably, whereas EIC affinity increased intensely following irradiation. 2. Radiation effect increased in proportion to the radiation dose, the modification of hemoglobin being at its maximum state with radiation doses exceeding 6,000 r. In this state the function of hemoglobin was quite similar to that of myoglobin. 3. These changes in the EIC binding function of hemoglobin seem to be due to modification of the globin moiety. The observed leftward shift and the asymmetric figure of the EIC equilibrium curve were explained by the mixed system of components: native and modified hemoglobin. 5. Myoglobin, when irradiated in its ferric state, showed no change in the EIC equilibrium curve as compared to native myoglobin, whereas ir-
radiated methemoglobin gave a similar change to oxyhemoglobin. 6. Catalase protected hemoglobin from irradiation by 20 per cent. Addition of glutathione before irradiation protected hemoglobin completely, although after irradiation there was only 41 per cent restoration. PCMB protected hemoglobin by 61 per cent. 7. Irradiation did not accelerate the decomposition rate of hemoglobin to verdo-hemoglobin. — K. F.


The effects were studied of whole body- and local irradiation and intravenous nitrogen mustard on the plasma clearance and red cell uptake of radioiron in rats. After 15 r whole body irradiation, red cell uptake was insignificantly higher than in controls, whereas it was delayed and depressed after 30–100 r. Plasma clearance was delayed even after 15 r. Local irradiation (100 r to thorax or upper abdomen) depressed red cell uptake as much as 100 r whole body irradiation. Nitrogen mustard had a similar effect. Recovery was underway by the 10th day. (Abstractor's note: The effect of local radiation in relation to whole body irradiation is worthy of confirmation. The port size was 4 x 5 cm. and the lead shield 1/4 inch. Whole-body irradiation results confirm those of F. Stohlman.) — P. G. R.


Determinations of iron in plasma and sweat were performed in 59 people who stayed in a hot humid place and who perspired 1 Kg. of sweat during 2 hours. No iron was found in the sweat of 24 persons; in the others the mean value was 30 µg. per 100 cc. of sweat. The mean value of plasma iron was 132 µg. per 100 cc. before staying in the acclimatization chamber and 131 µg. after. The report of Mitchell and Hamilton who had found the iron loss in sweat to be 6.5 mg. in 24 hrs. was thus not confirmed. The amount of iron lost is insignificant in man. No relation between amount of sweat and plasma iron was noted. The different results reported by other authors may be technical or due to the variation inherent in animal studies.— E. K.


A hematologic survey was carried out on 194 Bantu women attending an antenatal clinic. The average hemoglobin levels in the first, second, and third trimesters were 13.05, 12.40 and 12.40 Gm./100 ml. respectively. Values below 10 Gm./100 ml. were found only in 2 subjects, both of whom were in the third trimester. Blood smears in these two women showed hypochromia. There was no significant difference between the hematologic values in the pregnant group and a group of non-pregnant Bantu females belonging to the same socio-economic class. The reason for the low incidence in the Bantu of iron deficiency anemia during pregnancy was not elucidated in the present study. It has previously been suggested that this may relate to a high content of iron in the diet.— T. H. B.


Investigations into the I blood-group system are described and the serologic results obtained with two sera having anti-i specificity are reported. All human red cells were found to possess some I and some i, the amounts of the two antigens being reciprocally related. All infants at birth have the phenotype i which normally changes to I within 18 months of birth. In adults of the rare i phenotype, the I antigen fails to develop, due to the absence of an essential genetically-determined factor. A system of notation based on results obtained with anti-I and anti-i is proposed.— H. F.


An American family of English extraction is reported in which two Oh ("Bombay") members have transmitted A2 genes to their children, thus demonstrating that the expression of the gene A2, like that of the gene B, can be suppressed in this phenotype. Another American family, of French extraction, shows with a high degree of probability that the expression of the gene A1 can be similarly suppressed. (All previously reported "Bombay" bloods have been due to suppression of gene B.) — H. F.

Eleven cases of "Bombay" phenotype in six different Indian families are reported. Two of the families show evidence for the suppression of the ABO antigens. In one family B antigen was involved in two sibs with "Bombay" phenotype and in the other suppression was evident but the true ABO groups could not be ascertained. Most cases are identified due to crossmatching difficulty. The common occurrence of these cases from Bombay is pointed out and the importance of using anti-H as one of the reagents in doing ABO grouping in India is stressed.—H. F.


Two infants are described who were born to Rh-negative mothers with significant anti-D titers, and whose cord blood erythrocytes showed a positive antiglobulin test. Both of the infants appeared to be Rh-negative on repeated typing. Symptoms of hemolytic disease were mild in each. At about 9 months of age, the infants were retested. Again direct tests for D were negative; however, erythrocyte agglutination occurred when antiglobulin serum was added, after incubation of the red cell suspension with immune anti-D. These two cases bring to five the number of D' infants born to Rh-negative women with Rh-antibodies.—J. B. S.

Leukocytes


Previous work showed that the dilution of DFP32-labeled granulocytes after intravenous injection is twice that expected from the circulating leukocyte mass. The authors assume equilibrium and consider it possible to determine the size of the non-circulating, marginal granulocyte pool (MGP) and the granulocyte turnover rate (GTR), i.e., the number of granulocytes leaving the circulation per Kg. and day. Seventy prisoner-volunteers were studied. The MGP was 31.7 x 10^7 cells/Kg., or about equal to the circulating granulocyte pool (CGP). The GTR was 179.9 x 10^7/Kg./day, corresponding to an average T ¼ of 8.8 hours. Duplicate measurements in the same individual showed variations up to 100 per cent. Prednisone increased the CGP by 76 and the MGP by 53 per cent, but did not change the GTR. Exercise and epinephrine produced a shift of cells from MGP to CGP, and bacterial endotoxin a shift in the other direction. (Abstractor’s note: The figures given rest entirely upon the authors’ assumption that equilibrium will occur between the two pools, MGP and CGP, and their simultaneous assumption that there is no reflux of cells to these pools from the tissues.)—P. G. R.


In the first paper the authors describe an electrophoretic technic for the detection of leukocyte antibody. Guinea pig leukocytes treated with an heterologous anti-leukocyte antiserum showed decreased electrophoretic mobility when compared with similar leukocytes treated with non-immune serum. In the second paper it was shown that results obtained by the electrophoretic method correlated reasonably well with those obtained by the leukoagglutinin technic when 20 human sera suspected of containing leukocyte antibodies were studied. It was also shown that ABO incompatibility between the leukocyte and serum donors seemed to have no effect on the results obtained, suggesting to the authors that the A and B antigens are not present on the white cell surface.—T. E. B.


Leukergy was studied before and after the intramuscular injection of 25 mg. of ACTH. The same test was repeated on the next day after intravenous injection of 25 mg. of ACTH. Seventy-seven patients without any clinical signs of adrenal cortical insufficiency served as a control group; 11 patients suffering from adrenal cortex insufficiency were also investigated. Similar tests were performed in 50 albino rats, bilateral adrenalectomy being
performed in 10 of them. The author suggests the mechanism of leukery to be related to the functional state of the adrenal cortex. This test may be useful in the clinical evaluation of the adrenal cortex efficiency.—E. K.


Three cases of familial Pelger’s anomaly are presented. Absence of alkaline phosphatase activity in Pelger’s blood cells and an increase of DNA in the nuclei of Pelger’s leukocytes were found. In two individuals with Pelger’s anomaly, limited partial albinism was observed. An hypothesis is suggested that the genes of both anomalies are coupled.—E. K.


The effects of isologous bone marrow and isologous leukemoid leukocytes (the latter were presumably obtained from animals harboring a transplantable squamous cell carcinoma) in the treatment of acute lethal radiation injury in mice were compared. With either \(10^8\) bone marrow cells or \(10 \times 10^8\) leukemoid leukocytes, recovery rates of white cell elements, red blood cells, platelets, and body weight were nearly alike after irradiation. It is therefore suggested that stem cells, perhaps multi-potent ones, are present in mouse leukemoid peripheral blood. Homologous leukemoid leukocytes were usually detrimental to irradiated mice, presumably because immunologically competent cells were present and reacted against the tissues of the irradiated mice.—T. E. B.


Fulminating miliary tuberculosis in a 70-year old man was apparently mistaken for acute blastic leukemia. The diagnosis of leukemoid reaction, not leukemia, was based on post-mortem examination, which is never entirely satisfactory for making this differentiation. The literature on the association of blood dyscrasias with tuberculosis was reviewed, but references were not included with the article and must be obtained direct from the authors. It is reasonably concluded that patients who appear to have acute leukemia in the presence of even the slightest suspicion of tuberculosis should be given vigorous antituberculous therapy.—T. E. B.


Buffy coat obtained from two patients with chronic myelocytic leukemia and high basophil counts was found to convert C14-histidine to C14-histamine, suggesting that mammalian basophils can synthesize histamine by decarboxylating histidine.—T. E. B.


The principal diseases from which sera containing platelet auto-antibodies could be isolated were idiopathic thrombocytopenic purpura, hypersplenism (both primary and secondary), drug sensitivity, and neonatal purpura. Platelet antibodies were notably uncommon in acute and chronic leukemia. The principal diseases in which sera containing anti-leukocyte antibodies existed were hyperimmune drug sensitivity, hypersplenism (both secondary and primary), and aleukemic leukemia. The incidence of drug-mediated leukocyte antibodies was unexpectedly high, perhaps because of inadvertent case selection in the series and the widespread use of potent new therapeutic agents.—T. E. B.


Methods are described for a relatively simple system designed to measure the in vitro incorporation of several isotopically-labeled nucleic acid precursors into nucleic acid bases of human leukocytes. The results obtained in several patients
with chronic leukemias and in two non-leukemic subjects are presented as well as the result before and after x-radiation in two of the patients with chronic myelocytic leukemia. It is hoped that the system will be useful in investigating effects of chemotherapeutic agents on various indices of nucleic acid metabolism.—T. E. B.

**Butazolidine in the Treatment of Malignant Lymphogranulomatosis.** Z. Hanicki. From the School of Medicine, Kraków, Poland. Pol. Tyg. Lek. 557–558, 1961.

The beneficial effect of butazolidine in the treatment of malignant lymphogranulomatosis is confirmed. Antiphlogistic, analgesic and antifebrile effects are described. In only 2 of 15 patients was no improvement noted. No side effects were observed.—E. K.

**MISCELLANEOUS**


Some factors affecting the retention of human polymorphonuclear neutrophils (PMN), lymphocytes, and platelets on a siliconized glass bead column were explored. PMN and platelets were retained on the columns much more than were lymphocytes. PMN retention was greatest in the temperature range 30–43 C., was independent of cyanide and dinitrophenol, but was almost completely eliminated by iodoacetamide or by treatment of the blood with a chelating resin to remove divalent cations. Under the conditions in which PMN adhesiveness was lost, there was a concurrent loss of the usual ability of the PMN to migrate. The author suggests that the PMN plays an active role in the phenomenon of endothelial sticking of leucocytes as seen, for example, in local inflammatory reactions.—T. E. B.

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