Abstracts

Klaus Betke, M.D., Munich, Germany
Arthur Bloom, M.D., Cardiff, Wales
Thomas H. Bothwell, M.D., Johannesburg, S. Africa
John M. Bridges, M.D., Belfast, Northern Ireland
Jacques Caen, M.D., Paris, France
Jyoti B. Chatterjea, M.D., Calcutta, India
Pietro deNicola, M.D., Pavia, Italy
Ludvik Donner, M.D., Prague, Czechoslovakia
Patricia Fames, M.D., Providence, Ri.
Katsuhiro Fukutake, M.D., Tokyo, Japan
Frederick W. Gunz, M.D., Sydney, Australia
Susan R. Hollón, M.D., Budapest, Hungary
Michel Jamra, M.D., São Paulo, Brazil
Hans-Jürg Huser, M.D., Berne, Switzerland
Sven-Age Killmann, M.D., Copenhagen, Denmark
Frederick A. Klipstein, M.D., San Juan, Puerto Rico
Maria Kopeć, M.D., Warsaw, Poland
Guido Lucarelli, M.D., Pesaro, Italy
Georges Mathé, M.D., Villejuif, France
Alexander A. Morley, M.D., Adelaide, Australia
Thomas F. Necheles, M.D., Boston, Mass.
Bracha Ramot, M.D., Tel Hashomer, Israel
Peter G. Reizenstein, M.D., Stockholm, Sweden
Zoran Rolović, M.D., Belgrade, Yugoslavia
Edgardo S. Sack, M.D., Buenos Aires, Argentina
Julian B. Schorr, M.D., New York City
Manfred Steiner, M.D., Ph.D., Pawtucket, R.I.
John E. Ultmann, M.D., Chicago, Illinois
John Vaughn, M.D., Savannah, Georgia
Martin C. Verloop, M.D., Utrecht, The Netherlands
Ralph O. Wallerstein, M.D., San Francisco, Calif.
Harvey J. Weiss, New York, N.Y.

Erythrocytes


In the hemolysates of Porto Alegre hemoglobin carriers, the minor component hemoglobin PA3 has an anodic mobility at pH 8.1 that is larger than the corresponding Hb A in normal hemolysates. This faster, minor hemoglobin component is characterized by the following properties: (1) the relative concentration in the aged hemolysate is 28 ± 4.1%; (2) two -SH groups per tetramer have been determined by p-hydroxymercuocyanobenzoate titration, but after reduction with β-mercaptoethanol two additional free -SH groups per tetramer have been demonstrated indicating that this minor Hb PA3 component derives from hemoglobin Porto Alegre. The latter is known to have two additional free -SH groups; (3) it does not produce polymerization of the tetrarner as do the Porto Alegre hemoglobin tetramers; (4) reaction with mercuric chloride does not cause polymerization of the tetrarner of the minor component as it happens for the tetrarner of the major band of the Porto Alegre hemoglobin; (5) incubation with oxidized glutathione, before and after the reaction with N-ethylmaleimide, indicates that the extra thiol groups have formed a mixed disulfide with glutathione in vivo. -SH groups in position 93 of normal beta chains do not form a mixed disulfide with glutathione.—M.A.J.

The Occurrence of Heterozygous Beta Thalassaemia as Screened by Quantitative Hemoglobin Electrophoresis in Pregnancy. M. B. Smith, M. G. Whiteside, and D. G. Campbell. Pathology De-

Six hundred randomly selected antenatal patients were screened for a raised hemoglobin A₂ level by cellulose acetate electrophoresis. A raised level was found in 17 or 2.8%. All were from the Mediterranean area or from Asia. A raised level was found in 7.9% of Greek patients and 5.4% of Italian patients. Of the 17 patients 12 had previously been diagnosed as having thalassemia and features consistent with the disorder were subsequently found in the other five. Recently thalassemia has become common in Australia owing to the immigration of subjects from Mediterranean countries.—A.A.M.


Folic acid absorption from the intact alimentary tract of the rat was investigated by introducing a cannula into the portal vein. Simultaneous determination of various forms of folic acid in portal blood was performed. *Lactobacillus casei* was used to determine the methyl form, *Streptococcus faecalis* for formyl derivatives and pteroic acid, and *Pediococcus cerevisiae* for examination of folic acid. Synthetic folic and folinic acid and hydrolysates of various natural products were given by gastric tube. It was found that both, synthetic folic acid and its natural forms contained in the hydrolysates occurred mainly as methyl derivatives in the serum of portal blood. This indicates that mucosa of small intestine is a site of transformation of folic acid into its methyl, physiologically active form. Synthetic folinic acid was less intensively absorbed than synthetic folic acid. The rate of absorption of folic acid from hydrolysates of various products differed markedly. The quickest was the absorption from yeast, the slowest from liver hydrolysates.—M.K.

**CATALASE ACTIVITY OF ERYTHROCYTES IN PATIENTS SUFFERING FROM RHEUMATOID ARTHRITIS.** A. Stasiewiczowa. First Department of Internal Medicine, School of Medicine, Białystok, Poland. Acta Haemat. Pol. 1:375–377, 1970.

The catalase activity of erythrocytes was determined in 30 patients suffering from rheumatoid arthritis and in 20 individuals with degenerative arthritis. A considerable decrease of catalase activity was found in the rheumatoid arthritis group.—M.K.

**THE EFFECT OF EPSILON-AMINOCAPROIC ACID (EACA) ON THE POTASSIUM (42K) CONTENT OF ERYTHROCYTES.** R. Grabowski, M. Bielawiec, and Z. Wojtowicz. Department of Hematology and Department of Medical Physics, School of Medicine, Białystok, Poland. Pol. Tyg. Lek. 25:2025–2027, 1970.

It was found that EACA increases the uptake of 42K by erythrocytes in vitro when EACA is added up to a final concentration of 1–50 mg/ml. High concentrations of EACA of 100 mg/ml induced a decrease of 42K uptake probably due to erythrocyte damage. Similar results were obtained when heparinized whole blood or saline suspensions of erythrocytes were examined.—M.K.


Free nucleotides (AMP, ADP, ATP, NAD, NADP, CPD-x and GTP), 2,3-DPG, total phosphorus and lactic acid were determined in the erythrocytes of patients with acquired hemolytic and refractory anemia. In hemolytic anemia, a statistically significant rise in the concentration of AMP, ADP, ATP, NADP, 2,3-DPG, total phosphorus and lactic acid was observed, while the ratios ATP/ADP and NAD/NADP were decreased. Greater abnormalities were present during exacerbation than during remission of the disease. In refractory anemias, the concentrations of AMP, ADP, ATP, NADP, 2,3-DPG rose, the NAD/NADP ratio increased, the ATP/ADP ratio fell during exacerbation, while during remission these values returned to nearly normal levels. According to the authors, the observed changes of erythrocyte metabolism in various stages
of the disease in both types of anemia should be explained by differences in the age of the erythrocyte population than by specific metabolic disturbances.—M.K.


Lactate production and activity of phosphohexoisomerase, phosphofructokinase, aldolase and glucose-6-phosphate dehydrogenase of erythrocytes were determined in patients with polycythemia vera, during the course of the disease and in its terminal leukemic or osteomyelosclerotic stage. Marked decrease in phosphofructokinase activity was observed in polycythemia and osteomyelosclerosis. Increases in both aldolase activity and lactate production occurred in the terminal leukemic phase of the disease.

—M.K.

BONE MARROW IN THE COURSE OF RHEUMATOID ARTHRITIS IN CHILDREN. H. Rondio. Faculty of Pediatrics, Postgraduate School of Medicine, Warsaw, Poland. Reumatologia 8:319-332, 1970.

The bone marrow of 55 children with rheumatoid arthritis (r.a.) was examined and the results obtained were related to stage and duration of the disease, radiological changes in the skeletal system, treatment and changes in the peripheral blood. No evidence of bone marrow depression was found. The changes corresponded to the reaction described as interstitial myelitis. Its disappearance during remissions of the disease suggests reversibility of the bone marrow damage. Inhibition of erythropoiesis was marked in children with r.a. of long duration. Sideroblasts were present in all of the 45 examined cases, being more numerous in the benign forms of r.a.—M.K.


The authors found a very shortened life span of $^{51}$Cr tagged red cells with increased splenic uptake. There was intravascular red cell destruction, increased fragility and partial breakdown of red cells which were subsequently trapped and destroyed by the spleen.—J.C.


Fifty-seven children with congenital heart disease were examined. It was found that in certain cases, erythrocytosis may mask an anemia due to iron deficiency. Average erythrocyte count and hematocrit values were slightly increased, hemoglobin level within normal limits, MCH was normal, MCV increased and MCHC was decreased as compared with normal values. Low counts of monocytes and eosinophils were found as characteristic pattern of the differential white cell counts.—M.K.


Fifty-nine patients with polycythemia were investigated. Radiological examination of the urinary system (urography, arteriography and ureteropyelography) demonstrated abnormalities in 14 cases (23.7%). The most frequent were renal malformations (double pelvis or ureters). In three cases, radiological evidence of cirrhotic changes in the kidneys indicated that these changes could be responsible for the polycythemia. In one patient this suggestion was confirmed by the good result of nephrectomy.—M.K.

LEUKOCYTES

Effect of Cyclic AMP on Release of Lyosomal Enzymes from Phagocytes.

Macrophages and polymorphonuclear leukocytes were allowed to ingest various particles, and release of lysosomal and cytoplasmic enzymes was studied. Colchicine and vinblastine, agents affecting microtubules, inhibited 1)0th particle uptake and release of lysosomal enzymes. Cyclic AMP in combination with theophylline inhibited lysosomal enzyme release but had no effect on particle uptake. This suggests that cyclic AMP may regulate the vacuolar system of endocytic cells.—A.A.M.


The authors present the case of a 12-yr-old girl suffering from an unusual infiltrative lymphoma considered of the Burkitt's variety which ended with a leukemic picture. The disease started with infiltration of lymphatic areas of the face with protrusion of the eyes, and also with lymphoreticular involvement of both ovaries. Later, tumors shrunk spontaneously. On the other hand, blast cells (leukosarcomatous cells) appeared in the peripheral blood at that time. The patient was treated with vincristine and cyclophosphamide. The young girl survived 13 mo. Bronchopneumonia and a cerebral hemorrhage led to her demise. The evolution of the hematological findings is presented, including a serological survey of the antibody titer against Jijoye antigen. An increase of the antibody titer in the final stage of the disease was noticed. Hypogammaglobulinemia was also seen.—M.A.J.


Five rabbits and one horse were immunized with a pure suspension of lymphocytes from the blood of two patients with untreated chronic lymphatic leukemia. The immune sera obtained and gamma globulins isolated from them showed in vitro a high activity of leukoagglutinins and lymphoagglutinins as well as cytotoxic antibodies. The highest titer of lymphoagglutinins and cytotoxic antibodies was related to the lymphocytes of patients with chronic lymphatic leukemia. The antilymphocytic serum contained no, or only traces of, antiplatelet antibodies, or precipitating antibodies against human serum proteins or extracts of human kidneys.—M.K.


The author describes megaloblastic erythropoiesis during the regression phase of leukemic cells in the marrow, preceding hematologic remission after treatment. This is attributed to the antifolic action of amethopterine and may be used as an indication of the probable effectiveness of the drug in therapeutic programs. He also suggests that the effect could be used as an auxiliary diagnostic measure in suspected cases of acute myeloblastic leukemia.—J.V.


The karyotypes of spleen cells in two cases of osteomyelosclerosis and 2 cases of chronic myeloid leukemia were examined. In osteomyelosclerosis spleen cells showed nonspecific chromosomal abnormalities in the form of aneuploidy. No Ph1 chromosome was found in them. On the other hand, in chronic myeloid leukemia most spleen cells
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contained the Phi chromosome. On the ground of the obtained results the authors conclude that myeloid metaplasia of the spleen in these two pathological conditions is of different nature.—M.K.


The prednisolone test carried out in the initial phase of infectious mononucleosis revealed a lower than normal number of mobilizable neutrophilic granulocytes indicating a deficiency of granulocyte reserves. Increase in the usually low granulocyte alkaline phosphatase score after prednisolone administration was variable. Repeated testing indicated that the number of mobilizable neutrophilic granulocytes became normal after 1–3 wk.—S.R.H.


The hematological effects of therapeutic 198Au, 32P and 131I on leucocytes with special regard to volume changes were studied in 50 patients. Radiogold was applied only by intracavitary injection; 32P was administered in fractionated oral doses or in combination with endolympathic therapy. The application of 131I was limited to diseases of the thyroid. With local application of the above radioisotopes, the peripheral blood picture seems to be insufficient for obtaining reference values. Evaluation was therefore based on the radiation induced volume changes of the leucocyte population, a characteristic sign of a partial (or total) bone marrow injury. To determine exactly the number and volume of leucocytes, an electronic counter (Coulter, Model B) was used and the maximum volume of leucocytes (LVM), and its gradual changes after application of the radioisotopes were determined. By this method, an unambiguous correlation was found between irradiation dose and changes in LVM. The “dose threshold” fell in a range undeterminable by the conventional methods of cell counting.—S.R.H.


Osmotic resistance of leucocytes was investigated in 101 patients with rheumatoid arthritis before and after treatment and was found to be significantly diminished. The decrease in osmotic fragility of leucocytes became more pronounced with progression of the disease and persisted in remissions achieved by treatment.—M.K.

**HEMOSTASIS**


When platelets were exposed to prolonged irradiation with ultraviolet light (253.7 nm) aggregation could be induced. Addition of extracellular fibrinogen markedly enhanced aggregation and was followed by a gradual release of small amounts of nucleotides and serotonin. Aggregation by UV-light was completely inhibited by the addition of EDTA or a combination of 2-deoxy-D-glucose and antimycin A. Ca++ was a necessary cofactor when platelets were isolated in a Ca++-free medium. Calcium and fibrinogen could be added up to 10 min after platelet irradiation with aggregation not occurring until both these agents were present. This result seemed to indicate that a change may be induced in the platelet by UV-light in the absence of these two factors and that it persists for a considerable period of time. Adenosine, prostaglandin E, and apyrase produced only very minimal inhibition of UV-induced aggregation which suggested that UV-light induces aggregation by a mechanism not mediated by ADP. Possible explanations for this effect of UV-light on
platelets were discussed by the authors. They attribute particular interest to the observation that UV-light may be used to study platelet aggregation after removal of the stimulus by delaying addition of fibrinogen until irradiation has ceased.—M.S.


The activity of factor XIII was determined in the precipitates obtained during incubation of human plasma with dextran, glycogen or amylopectin, and in the fraction of plasma cryoglobulins. It was found that factor XIII is precipitated from the plasma under the influence of polysaccharides and at low temperature, similarly to fibrinogen, but in a smaller degree than the antithrombophilic globulin. Glucose prevented the precipitation of factor XIII.—M.K.


Three sisters in a sibship of five were shown to be suffering from Factor XIII deficiency. The symptoms included bleeding from the umbilical cord and following tonsillectomy, traumatic hemarthropathies and excessive bruising. One patient died from an intracranial hemorrhage. Factor XIII was assayed in terms of 14C-labeled glycine ethyl ester incorporation and found to be absent in the two surviving patients. The mother, maternal grandmother, father and paternal grandmother all had low-normal Factor XIII levels whereas the levels were normal in other family members. The inheritance was that of an autosomal recessive rather than of a sex-linked recessive character.—F.W.G.


Lipid peroxidation was studied in platelets exposed to a variety of aggregating agents and to specific antibody. Human and rat platelets were used either unwashed and suspended in a plasma medium or washed and suspended in an artificial medium. The products of lipid peroxidation were measured as malonaldehyde by reaction with thiobarbituric acid. Neither adenosine diphosphate (ADP) nor epinephrine increased lipid peroxide formation. The presence or absence of aggregation did not influence these results. Ca++ and Mg++ caused aggregation and accelerated lipid peroxide formation when incubated for one hour at 37°C. Thrombin at concentration of 1 U/ml or greater produced aggregation and rapidly increased lipid peroxidation; this effect was pH dependent. Polystyrene latex particles induced both strong aggregation and lipid peroxidation. Glutathione (SH) inhibitors, p-chloromercuribenzoate (CMB) and N-ethyl maleimide (NEM), enhanced lipid peroxidation in washed platelets two- to threefold over that found in the controls. Heterologous antibody agglutinated platelets and stimulated lipid peroxide formation. Reduced glutathione (GSH) and dithiothreitol (DTT) effectively blocked lipid peroxidation produced by thrombin, SH inhibitors, and platelet antibody without inhibiting aggregation. It is concluded that aggregation as such is not a stimulus to increased lipid peroxidation. The acceleration in lipid peroxidation formation resulting from exposure of platelets to thrombin, latex particles, or heterologous antibody may participate in the deleterious effect of these aggregating agents on platelets.—M.S.


The incorporation of acetate and fatty acids into rat platelet lipids was studied by incubating washed platelets with acetate-1-14C or albumin-bound fatty acids-1-14C.
BLOOD COAGULATION AND THE ROLE OF (palmitic, oleic, linoleic, and linolenic acid) in an artificial medium without addition of cofactors. Acetate was incorporated primarily into PC, TG, CEM, FFA, and PE which accounted for three fourths of its total incorporation into lipids. Palmitate incorporation into platelet lipids was twice as high as that of each of the unsaturated fatty acids. A distinctive pattern of distribution of palmitate or of the unsaturated fatty acids among the various lipid classes was observed as well as differences in the relative abundance of the fatty acids incorporated into each PL group. Rat platelets are therefore capable of incorporation of fatty acids from the suspending medium, and of de novo synthesis of fatty acids. Pattern of fatty acid incorporation and rate of de novo synthesis appear to be different from those in human platelets.—M.S.


The thrombin clotting time was compared to the whole blood clotting time as an index of heparin effect. The thrombin clotting time was as convenient and had a lower coefficient of variation, 5% as compared with 14%. The literature on the effects of heparin on coagulation, the monitoring of therapy and the complications of therapy is reviewed.—A.A.M.


The submicroscopic features of the developing forms of megakaryocytes were investigated in the mouse spleen. The criteria for classification of the individual maturation stages, the supposed double role of the Golgi apparatus, the changes in the chromatin substance of the cell nucleus and their possible functional background are discussed.—S.R.H.


In a study of hemostasis in 15 patients with subacute and chronic hypoplastic anemia, two of them in remission, the thromboplastic effects of hemolyzed and intact red cells upon various coagulation indices, including platelet function, coagulation factors, heparin tolerance and fibrinolytic activity were observed. Little variation from normal was observed in those patients with little or no hemorrhagic manifestations but in the others, a marked reduction in red cell thromboplastic activity was noted.—J.V.


From this study of coagulation by standard and some newer techniques, the author considers that red cells accelerate the coagulation process in its preliminary phase, before the action of factor X, and also affect the prothrombin and thrombin times. During hemostasis the erythrocytic action is exerted directly after the blood is extravasated or, if it be collected in anticoagulant, immediately after recalcification. J.V.

BLOOD CLOTTING IN PEOPLE CHRONICALLY EXPOSED TO CARBON DISULPHIDE. K. Pilarska and M. Woyke. First Department of Internal Medicine, School of Medicine, Szczecin, Poland. Med. Pracy 21:563–568, 1970.

Bleeding time, clotting time, thrombocyte counts and TEG were examined in 51 people with chronic, occupational exposure to carbon disulfide (CS₂). This experimental group was divided into two subgroups, one with actual exposure and the second of retired workers who had ceased to be exposed to CS₂. The results indicate that chronic exposure to CS₂ leads to prolongation of blood clotting and to moderate inhibition of fibrinolysis. These changes were observed only during actual exposure to CS₂. For personal use only.
but not in the people who had been exposed to it in the past.—M.K.

**The Effect of Splenectomy on the Clinical Picture and on the Survival Time of Platelets in Children with Chronic Idiopathic Thrombocytopenia.** J. Kozlańska, R. Rokicka, L. Konopka, K. Rechowicz, B. Kotelba-Witkowska, and S. Pawelki. First Department of Pediatrics, School of Medicine and Department of Internal Medicine, Institute of Hematology, Warsaw, Poland. Pediat. Pol. 45:901-909, 1970.

Twenty-three children with chronic thrombocytopenia were treated by splenectomy. In 15 cases, very good and good results were observed, consisting in complete disappearance of the hemorrhagic diathesis, normalization of platelet count, and survival of isologous 51Cr platelets. Very good results of splenectomy were obtained mainly in patients showing an increased spleen-liver index calculated from external counting after infusion of labeled platelets. High value of this index together with reduced survival of 51Cr platelets is, according to the author’s opinion, the best criterion for prediction of late results of splenectomy in chronic idiopathic thrombocytopenic purpura.—M.K.

**IMMUNOHEMATOLOGY**


The effect of antithymic serum on skin allograft survival and on the migration inhibition test (MIT) in guinea pigs and mice was investigated. The animals were treated with rabbit anti guinea pig thymocyte serum (RAGTS) or rabbit anti-mice thymocyte serum (RAMTS) one day before, on the same day and on the second, third, fourth, and sixth day after allogenic skin grafting. MIT was examined in in vitro cultured cells from spleens removed on the 19th day after skin grafting, using antigens from the spleens of skin donors. Two control groups consisted of animals grafted and treated with normal rabbit serum (NRS) and of animals ungrafted and untreated. It was found that RAGTS as well as RAMTS induce moderate prolongation of the survival of skin grafts and abolish the inhibition of spleen cell migration observed in the system.—M.K.


Investigations for the presence of Australia antigen and corresponding antibody were carried out in the serum of 1514 blood donors. Using the double diffusion method in agar-gel the antigen was found in 14 (0.9%) donors, while complement fixation test was positive in 19 (1.25%) cases. Antibody was found in one case only. Repeated tests of aminotransferase activity (AspAT and AiAT) revealed their periodical increase in most cases, with that of AiAT prevailing. A positive correlation was established between Australia antigen and male sex and a significantly more frequent presence of this antigen in blood donors with group A and AB was observed.—M.K.

**The Level of Natural Isoagglutinins in Children of Various Age Groups.** H. Szczepańska and I. Zalewska. Department of Children’s Infectious Diseases, School of Medicine, Warsaw, Poland. Pediat. Pol. 46:7-12, 1971.

Titer of isohemagglutinins of the ABO blood group system were examined in 1267 children of various ages. A continuous rise in the titers was observed from 1 to 10 yr of age. Starting from the age of 5 yr, the titers were higher in girls than in boys. The influence of exogenous factors on the isoagglutinin titer became clear when four groups of children with infectious diseases were examined (infectious mononucleosis, 54 cases; virus hepatitis, 107 cases; measles, 40 cases; scarlet fever, 104 cases). The average titer in mononucleosis was 300, while in measles it was 151. The observed rate of
increase in isohemagglutinin titer with age was compared with that described 40 yr ago by Thomsen and Kettel (Z. Immunforsch. 63:63, 1929) and no significant difference was found. The authors conclude therefore that exogenous factors have an evident influence on the titers of genetically determined isohemagglutinins, but that the serologic maturation with age of the ABO isoagglutinin system has not changed during the last 40 years.—M.K.

**MISCELLANEOUS**


The difference in rats between the radiation doses causing a bone marrow type or an intestinal type of death is much lower than for mice. Accordingly, the generally accepted view is that the spleen colony technique developed by Till and McCulloch cannot be extended to the study of hemopoiesis in rats, or at best, when prolonged irradiation at a low dose rate is applied. However, extensive hematological and survival studies by the authors have proved that practically under the same irradiation conditions as those used in experiments with mice, one may select dose values that almost completely arrest hemopoiesis without causing early and/or mass mortality among the animals. In fact, the majority of rats will survive for the 9–10 days necessary for the development of spleen colonies. The formation of a single spleen colony requires the transplantation of about $0.2 \times 10^5$ isologous bone marrow cells following lethal exposure.—S.R.H.


A new form of mucopolysaccharidosis observed in two male brothers, sons of first cousins is described. The characteristics of the disease are: somatic hypoevolutism without signs of gargoylism, cutaneous and
articular hyperelasticity, subcortical cerebral disturbances with periodical long “absences” or epileptoid crises, very marked hepatomegaly and splenomegaly. The mucopolysacchariduria was not increased. The skeletal X-ray examination showed only a Klippel-Feil syndrome and a light dorsal platyspondyly. This new form of mucopolysaccharidosis is chiefly characterized by very severe polymorphous congenital disturbances of the hemopoietic system with mucopolysaccharides in the myelocytes, promyelocytes and erythroblasts, frequent phagocytosis of granulocytes and megakaryocytes, a very marked degree of ineffective erythropoiesis with anemia, absence of lymphocytic and reticulo-histiocytic cells in the bone marrow with dysgammaglobulinemia (type IV), and stable leukopenia and thrombocytopenia due to “hypersplenism.”—G.L.

MULTIPLE MYELOMA ASSOCIATED WITH PROGRESSIVE MULTIFOCAL LEUKOENCEPHALOPATHY AND PNEUMOCYSTIS CARINII PNEUMONIA. H. Gordon, M. Bandmann and U. Sandbank. Department of Medicine B and J. Casper Department of Pathology, Belinson Medical Center, Petah Tikva and Tel-Aviv University Medical School, Israel. Israel J. Med. Sci. 5:581-588, 1970.

A case is reported of a patient suffering from multiple myeloma of long duration, who died of pneumonia due to Pneumocystis carinii. Postmortem examination revealed the features of progressive multifocal leukoencephalopathy (PML), and Papova virus-like particles were demonstrated within the nuclei of the affected glial cells. Whether this finding may be interpreted as supporting a viral etiology of PML, and the relationship between this disease and multiple myeloma are discussed.—B.R.


Dogs treated by repeated doses of carbon tetrachloride to produce toxic hepatitis were given transfusions of freshly prepared blood and plasma during the administration of the poison. The transfusions effectively prevented the development of severe morphologic changes in the liver. Transfusions given at later stages in the experiment caused a rapid and almost complete disappearance of such lesions as did develop, an effect even more pronounced when plasma transfusions were given. The authors attribute this hemotherapeutic effect to a rapid restoration of the hepatic blood circulation promoting a more normal permeability of the cell membranes and an increase in the regenerative capacity of the liver—J.V.


This is a study of liver function in a series of 91 patients suffering the effects of incompatible blood transfusions. The patients, 81 of whom were women, were admitted 3-8 days after the transfusions and 77 were severely ill (second and third degree). Treatment was by hemodialysis in 73 patients, the others being treated conservatively; 13 patients died. In the oliguric stage, formation of protein, pigment and urea by the liver was disturbed; hypoproteinemina with hypoalbuminemia, decreased prothrombin and proconvertin, and low blood urea levels were noted. In the polyuric and recovery stages, total proteins returned almost to normal but with hyperfibrinogenemia; the prothrombin complex of proteins remained reduced. Bilirubin levels, high initially, fell during recovery except for patients with an associated toxic hepatitis. In some patients toxemias were associated with low blood urea levels and this was regarded as being due to increased blood ammonia content associated with impaired urea synthesis. Abstractor's Comment: The Central Institute in Moscow receives patients from all over the U.S.S.R. including remote areas, thus accumulating an almost unique wealth of experience in the observation and treatment of incompatible blood transfusions reactions.—J.V.
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THE SMALL INTESTINE IN EXPERIMENTAL ACUTE IRON POISONING. C. S. Hosking.

The histological appearance of the small intestine in rats following oral administration of poisonous doses of ferrous sulphate was studied. With very large doses gross shrinkage of the villi, epithelial edema and loss of epithelium occurred; with lower doses and longer survival, gross destruction of the villous stalk was frequent.—J.M.B.