LEUKOCYTES


Urines from 16 blastic, 10 granulocytic and 7 lymphocytic leukemias were chromatographed, together with those from 71 controls. Spots were evaluated subjectively according to a 1–10 scale. No standard deviations of mean excretion values thus obtained were given. No difference was found for arginine—lysine, methyl histidine, glycine, taurine and alanine. Histidine, aspartic acid, leucine, tyrosine and valine were between 1/20 to 3/4 of normal in all leukemic groups. Serine was low in lymphocytic leukemia, glutamine in the other forms. Threonine and methionine were high in all leukemias.—P. G. R.

EFFECTS OF EXTRACORPOREAL IRRADIATION OF THE BLOOD ON LEUKEMIA: MALIG-

The Ph1 chromosome, first described in 1960, is a characteristic feature of chronic granulocytic leukemia and occurs in most patients with this disease. Cytogenetic changes are observed in acute leukemia. These changes are aneuploidy with from 41 to 60 chromosomes, rather than the normal diploid number of 46. Four patients with CML in blast crisis were studied. Cytogenetic analysis of 2 of these patients showed 2 Ph1 chromosomes in their granulocytic cells and hyperdiploidy. Two other patients with CML in blast crisis maintained a diploid mode of 46 chromosomes and a single Ph1 chromosome during the period of their crisis. The patients with double Ph1 chromosomes and additional hyperploidy often had an unusual clinical course. Blastic leukemic cells invaded extramedullary organs, causing marked lymphadenopathy, lytic bone lesions and soft tissue tumors with microscopic findings in tissue specimens that were difficult to differentiate from reticulum cell sarcoma. The authors speculated that the cytogenetic changes might adapt leukemic cells for invasion of multiple organs.—J. E. U.


The clinical course could be divided into a preleukemic and a leukemic phase, the latter lasting 20 months. The classification of chronic monocyctic leukemia was reviewed and reevaluated.—B. R.


Eight cases of gastric lymphoma were observed among 320 malignant stomach tumors seen in a large general hospital between 1954 and 1966. Gastric lymphoma made up 2.5 per cent of the gastric neoplasms subjected to surgery and histopathologic studies. In 4 cases, the histologic diagnosis was reticulosarcoma, in 2 lymphocytic lymphosarcoma, and in one Hodgkins granuloma. Epigastric pain and loss of weight were the main symptoms, but 4 patients presented with a picture resembling peptic ulcer. Two cases survived more than five years after surgery.—M. J.


A hamster amelanoma, grown in rabbits, the S-37 and 180 mouse sarcomas and the Brown-Pearce and V2 rabbit carcinomas, induce lymphomas when transplanted subcutaneously to hamsters. The lymphomas develop at the transplantation site and are hamster tumors in identity. There is no evidence that an oncogenic virus is concerned in their origin. On the contrary, the findings suggest that the tumors represent a neoplastic conversion of lymphoblasts in response to antigens introduced by the transplanted tissues.—J. E. U.


Stem-cell or undifferentiated lymphoma histologically similar to that present in Burkitt’s lymphoma in human beings has been observed in Swiss mice subsequent to the injection of a cell passage line started from a single mouse who developed lymphoma following injection of cell-free fluid from a tissue culture of the Rauscher virus. Virus particles were demonstrated in the tumor by electron microscopy. These observations served to substantiate the view that a distinction must be made between the clinical and histologic findings in Burkitt’s lymphoma. Although the clinical findings appear to have been associated with only a relatively few tumors reported in regions other than
Africa, this histologic type of lymphoma has not been rare. The histologic features which have been reported as similar to those of Burkitt's lymphoma have been found in tumors of dogs and cats and in tumors of human beings in all parts of the world. In the tumors of mice reported here, the histologic findings were characteristic of Burkitt's lymphoma, although the distribution of lesions, notably the absence of involvement of jaw bones and the retroperitoneum, were unlike those described from Africa.—J. E. U.


During a 3½ year period, 3 histologically confirmed malignant lymphoma cases and 3 additional clinically diagnosed cases were observed among 34 cats kept for varying lengths of time in the same household. The 3 clinical diagnoses were supported by surgery and necropsy findings consistent with a diagnosis of malignant lymphoma. On the basis of existing incidence data, the occurrence of 3 to 6 cases in 34 cats was far higher than would be expected due to chance alone. The pattern and occurrence of cases may best be explained by horizontal transmission of an infectious agent. There was a continuum of contact from the 1st to the 6th case. One cat was not known to be related to any of the others. Five of the 6, however, were related. There was, therefore, the possibility of inheritance of a genetic factor which affected susceptibility.—J. E. U.


Rats whose peripheral white counts had been lowered by 400 R of total body X-irradiation served as donors of plasma which was injected intraperitoneally into recipient rats in 5 ml quantities under sterile and pyrogen-free conditions. The effect of injection of plasma from irradiated donors was production of a leukocytosis, due to numerical increases of both neutrophils and lymphocytes. This leukocytosis was of greater magnitude than that resulting from injection of plasma from sham-irradiated donors. The more severe the leukopenia in the irradiated plasma donor, the greater was the capacity of the plasma to increase the peripheral white count of recipients; of the intervals tested, the effect was greatest 4 days after irradiation. Quantitative analysis of the peripheral blood of recipients indicated that the resultant leukocytoses were due primarily to increases in the neutrophil population. Study of the bone marrow showed that there had been expulsion of granulocytes in recipients of plasma from irradiated donors, as contrasted with the lack of such an effect by plasma from sham-irradiated animals. The results suggested that depletion of circulating leukocytes following X-irradiation was accompanied by the appearance in the peripheral blood of a certain factor which acted to restore the normal numbers of circulating leukocytes. This factor acted at least, in part, by causing expulsion of stored neutrophils from the bone marrow and may in addition have had some effect in increasing neutrophil production.—J. E. U.


Twenty-one synovial aspirates from 19 patients with joint effusions resulting from rheumatoid arthritis, rheumatic fever, familial Mediterranean fever, septic arthritis, gout, traumatic arthritis, osteoarthritis and pulmonary osteoarthropathy were examined. Phase-contrast microscopy revealed spherical refractile cytoplasmic inclusions, 0.5 to 2μ in diameter, in the neutrophilic leukocytes of all cases. The triglyceride nature of these inclusions was established by their selective affinity for Sudan III and Oil Red O, fluorescence with Neutral red and Rhodamine B and their electron microscopic appearance. They were a sign of cellular damage, having neither diagnostic nor etiologic specificity.—B. R.

Extracts of leukocytes from healthy people and from 10 patients with granulocytic leukemia were studied. Four bands were observed on starch gel electrophoresis of acid phosphatase from normal leukocytes. In 8 cases of granulocytic leukemia, only one band was observed and, in two other patients, two bands were found. Alkaline phosphatase activity, demonstrable on starch gel electrophoresis, was found in leukocytes of only three patients. The active fraction had greater electrophoretic mobility than that of normal leukocytes.—M. K.


The Chediak-Higashi syndrome (C-HS) is an inherited disease of the membrane-bound organelles of various cell types and has been reported in man, mink and cattle. There have been several reports in the literature which described gross and histologic changes in children with the C-HS. Death was caused by massive hemorrhage, pneumonia or infections which usually had been repeated problems clinically. An infiltrate composed of lymphocytes, reticulocytes and histiocytes was present in various tissues of most of the affected children. In 5 affected children, this cellular accumulation led to a diagnosis of malignant lymphoma. In the present paper, the lesions of C-HS-affected children, mink and cattle were compared. The histologic appearance of the inflammatory response was similar to that evoked by bacteria or a virus in non-C-HS individuals of all 3 species examined. The lesions of Aleutian disease occurred more rapidly in C-HS than in non-C-HS mink, but their histologic appearances were similar.—J. E. U.


Granulocytes from peripheral blood were studied in 20 children with Downs syndrome and trisomy of G group chromosomes and in their parents with normal karyotypes. In Downs syndrome, frequent stab-cells and bilobulated nuclei similar to those found in the Pelger-Huet anomaly were observed. The Davidson-Smith test showed a decrease in the number of chromatid appendages of the nucleus of neutrophils, including the drum stick forms. This observation makes the evaluation of sex-dimorphism in Downs syndrome difficult.—M. K.


Investigations were carried out in 65 patients with tuberculosis and in 43 controls. Preparations stained with toluidine blue showed 0 to 5 per cent basophils (average 1.4) and an increase in the number of lymphocytes in artificially induced cantharidin blisters in positive tuberculin tests. Basophils were also observed in the exudate of skin-windows on tuberculin infiltrates. Percentage of basophils in cantharidin blisters induced in healthy skin of patients with tuberculosis and in the control group was, on the average, 0.1–0.2 per cent and the number of lymphocytes was less.—M. K.
HEMOSTASIS


A one-stage method for the measurement of coagulation factor activity, based on established principles and adapted for an automatic recording procedure, was used. Experimental error (coefficient of variation) was 5.7 per cent for Factor VIII, 8.1 for Factor IX and 7.3 for Factor XII. Average Factor VIII activity found in 30 proved carriers of hemophilia A was 51 per cent of normal; standard deviation for this population was 0.21 and the values were symmetrically distributed. Biological variation of Factor VIII activity within the individual was 0.084 for carriers and 0.061 for normals. For the carriers of hemophilia B, the average Factor IX activity was 50 per cent and the standard deviation 0.13. The variation within the individual was 0.066 for carriers and 0.0577 for normals. On the basis of these observations, it was possible to discriminate carriers and normals with a 95 per cent confidence level, potential carriers of hemophilia A in 34 per cent and of hemophilia B in 59 per cent of cases. The chance of carriership could be calculated for individual cases, with Bayes' theories, from the known chance of carriership on genetic grounds and the observed Factor VIII or IX activity. The bi-modal distribution of the results obtained in 50 obligatory heterozygotes for Hageman trait reflected the occurrence of two normal iso-alleles in obligatory heterozygotes, one with 23 per cent and the other with 60 per cent Factor XII activity. The entire group showed a mean activity of about 50 per cent of normal.—F. J. C.

PLATELETS, COAGULATION FACTORS AND 5-HYDROXYTRYPTAMINE IN SENSITIZATION ANAPHYLAXIS AND BURN INJURIES. EFFECT OF HEPARIN AND POSSIBLE RELATION TO INTRAVASCULAR COAGULATION. S. A. Johansson. From Karolinska Hospi

Sensitization alone may result in decrease in platelet count and coagulation time which are inversely related to antigen concentration. Anaphylaxis and burns lead to more marked decreases in platelet count, decreases of several plasmatic coagulation factors, and to increased antithrombic activity of blood. Similar changes have appeared in one case of generalized hemorrhagic purpura due to vaccinia and one patient with biliary cirrhosis and a bleeding tendency. Thrombocytosis is noted after the thrombocytopenia in experimental animals and man. Heparin treatment prior to trauma inhibits platelet and coagulation factor changes and increases the survival time of rabbits exposed to trauma by anaphylaxis and burns. Clinically, heparin seems to prevent provoked allergic reactions, to allay shock, and to stop bleeding due to intravascular coagulation.—P. G. R.

The most common findings were thrombocytopenia and impaired prothrombin consumption. Many patients had abnormally high levels of Factor VII, VIII and IX, prolonged prothrombin times and increased clot retraction. Fibrinolysis was found to be inhibited and fibrinogen levels were increased. Thromboelastography gave patterns considered to be characteristic of the hypercoagulable state. The clinical syndrome of consumption coagulopathy was not observed.—M. K.


The level of platelet factors 1, 2 and 4 was determined in 25 patients with renal failure. Factor 1 was decreased in eight, factor 3 in two. The activity of factor 4 was decreased in three and elevated in seven. There was no correlation between platelet factor activity and blood urea or creatinine levels.—M. K.


A child died at age 3 days from intracranial hemorrhage. Isoantibodies against the PLGrLyB1 antigen, common to platelets and white cells, were demonstrated in the serum of the mother. The role of maternal isoantibodies as a pathogenic factor in neonatal thrombocytopenic purpura was discussed.—M. K.


Plasminogen activator concentrations were found to be several times higher in placentas in missed abortion when compared to live-born placentas. On the contrary, in tissues of stillborn fetuses, activator concentrations were significantly lower in comparison to the values observed in live-born fetuses of the same age. Several weeks after intrauterine death, the placenta remains as practically the only element of the ovum with fibrinolytic activity. The meaning of these findings for the mechanisms of clotting disturbances in pregnancy was discussed.—M. K.

IMUNOHEMATOLOGY


The amino-acid sequence of the tetrapeptide isolated from both 3S γ1-globulin and carbonic anhydrase B was acetyl-alas-pro-asp; this peptide represented the N-terminus of both proteins. Thus, the chief component of plasma 3S γ1-globulin appeared to be identical with erythrocyte carbonic anhydrase B.—H. H. F.

ABSTRACTS

Studies on the occurrence of anti-Gm(a) antibodies in healthy children and on the Gm characteristics of their mothers were presented; 467 mothers and 468 children were examined. The frequency of anti-Gm (a) antibodies in the children was 3.9 per cent, but in Gm(a-) children from Gm(a+) mothers it was 22.7 per cent. These findings indicated that one mechanism for formation of anti-Gm antibodies may be immunization of the fetus by the mothers' Gm antigen.—M. K.


G-6-PD activity was examined with the indirect methemoglobin reduction test in erythrocytes of 43 pregnant women (36-40 weeks gestation) and in 10 healthy young women. Significantly decreased activity of G-6-PD was observed in cases with Rh isoimmunization.—M. K.

Attempts to Prevent Hydrops Fetalis by Intrauterine Transfusion. J. Kozlowska. From the School of Medicine, Warsaw, Poland. Pediat. Pol. 42:1140–1145, 1967.

Technical details of intrauterine transfusion are described and the author discusses the effects of this therapy in the prevention of hemolytic disease in comparison with other known methods used in the treatment of anti-D immunity.—M. K.


Success of exchange transfusion in newborn infants with hemolytic disease depends on: 1) quality and quantity of transfused blood, 2) amount of bilirubin removed from plasma and tissues, 3) plasma albumin level and 4) age of treated infant. The author concludes that exchange transfusion is only symptomatic treatment. Future prospects for the treatment of the newborn seem to depend on the progress of immunosuppressive therapy.—M. K.

ABO Group Substances in Amniotic Fluid. A. Turowska and A. Bramboszcz. From the School of Medicine, Kraków, Poland. Przegl. Lek. 23:731–733, 1967.

Sixty-two samples of amniotic fluid, blood and saliva of newborn babies and their mothers were studied for ABO group substances. The results indicated that group substances in amniotic fluid were derived from the child and that transabdominal amniocentesis and determination of blood group may be useful for diagnosis of serologic conflicts.—M. K.


In 218 patients with cirrhosis, ABO groups and Rh factor were determined. A statistically significant decrease in the incidence of group O and an increased occurrence of group B were observed.—M. K.

Erythrocytes


Plasma volume and red cell mass were measured with Cr51 tagged erythrocytes before and after Gemini flights IV, V and VII. A 144 to 333 ml. decrease in plasma volume and red cell mass was found. The investigators attributed this decrease to hemolysis during flight, but the cause was unknown.—P. G. R.


The technic of Munker was used to evaluate 51Cr distribution between erythro-
cytes and plasma. Studies were carried out on the influence of temperature, incubation time, hematocrit, hemoglobin type, saturation of blood with stable Cr and the type of incubating media. Optimal conditions for erythrocyte labeling were discussed.—M. K.


Results of radioactive sequestration studies in 23 cases of hemolytic anemia due to various causes were presented. No relationship was found between the results of splenic accumulation and any other parameter. Splenectomy was performed in nine patients and four received splenic irradiation. In five, response to splenectomy was contrary to that expected from the sequestration studies. In two receiving splenic irradiation, the response was contrary to that expected. Sequestration studies, as done at present, should not serve as the sole criteria for or against splenectomy in patients with hemolytic anemia.—B. R.


Hemoglobin values in 618 children in the new-immigrant town of Beit Shemesh averaged 10.66 Gm./100 ml. No correlation could be found between hemoglobin values and socio-economic factors, but a positive correlation could be demonstrated with a past history of severe diarrhea in infancy. The question of prophylactic iron supplements was raised.—B. R.


Low serum iron levels, increased latent iron binding ability and normochromic anemia were found in approximately 75 per cent of patients with depressive states.—M. K.


Serum iron levels were determined in 187 healthy people and 621 patients, fasting and after administration of 1.5 Gm. ferrous gluconate. Fasting serum Fe levels were low in patients with malignant tumors and were elevated in liver disease and in glomerulonephritis. Increased Fe absorption was detected in 37.5 per cent of patients with chronic pancreatitis, 12.5 with peptic ulcers. 25 with diabetes mellitus and 11.3 with chronic gastritis and enteritis.—M. K.


Four of 94 patients with pernicious anemia gave false positive tests for intrinsic factor antibody with conventional charcoal methods because of a high level of free vitamin B₁₂. This difficulty was avoided by preliminary adsorption of serum with albumin-coated charcoal to remove free B₁₂.—F. W. G.


Retention of 10⁻¹ to 10⁴ mg⁸⁶ Co B₁₂ (0.1 – 3 μc) given orally was studied in a 4π liquid scintillation whole body counter in 3 to 143 normal persons per dose, and 0.8 x 10⁻¹ to 4.5 x 10² μg were retained. Pernicious anemia patients retained as much as normals of 10⁴ μg. Oral treatment, with 300 μg daily as a recommended dose, was discussed. Sixty-five oral 10 μg doses were calculated to fill depleted stores as well as...
15 injections of $10^3$ $\mu$g OH-B$_{12}$, at approximately comparable cost. (Abstractor’s comment: Are 365 tablets yearly safer or more convenient than 6 injections?).—P. G. R.

**ABSTRACTS**


Autoradiographs were studied of five pregnant white mice killed two days before parturition and given 0.18 $\mu$g$^{58}$ Co-CN-B$_{12}$/g. body weight, of which 8 to 19 per cent was retained after 8 hours, and of 14 mice given 0.02 $\mu$g/g. After low dose, fetal tissue had a radio-B$_{12}$ concentration about 40 and, after high dose, about 4 times higher than maternal. Highest maternal concentration was found in placenta 1 hour after injection. High concentrations were also found in pituitary, adrenal, thyroid, gonads, liver and kidney cortex.—F. G. R.


A slow moving hemoglobin, discovered in an infant and subsequently in its mother who was of Ashkenazi origin, differed from hemoglobin A by the replacement of a 47 aspartic acid by histidine.—B. R.


Erythrocytes from 12 donors were stored at $-196^\circ$ for 2–10 months. Before freezing, plasma was removed and modified Krijnen fluid was added. The activity of phosphohexoseisomerase, aldolase, G-6-PD, GSH stability and concentration, inorganic phosphorus content were determined in erythrocytes and K+ and hemoglobin concentrations were examined in the suspending medium before and after storage. Prolonged storage at the temperature of liquid nitrogen and the process of freezing and thawing did not change significantly these properties of erythrocytes.—M. K.


The technical difficulties encountered in demonstrating the surface structure of the intact red cell membrane constitute a limiting factor in studying its appearance under normal and pathologic conditions. A new method for examining the surface of blood cells, using the Stereoscan electron microscope, is described. The present study has shown that the Stereoscan EM provides a direct three-dimensional picture of the red cell membrane. The limiting factor is the power of resolution (not less than 200 A), but this handicap is offset by the very large depth of focus. Consequently, examination of surface detail, alternations in contour, fissures, pores, or protuberances of the intact red cell membrane can be visualized with ease and without undue histologic preparation. The method is ideally suited for showing cell membrane morphology in a likeness which cannot be provided by any other microscopic technic and at a resolution bridging the gap between optical and conventional transmission electron microscopes. The potentialities and limitations of scanning electron microscopy are discussed.—J. E. U.


The rate of formation of porphobilinogen (PBG) and porphyrins was studied during incubation in vitro of erythrocytes from peripheral blood with delta-aminolevulinic acid (ALA) in patients with erythremic myelosis and polycythemia vera. In erythremic myelosis, the activity of ALA dehydrase was diminished, while in polycythemia vera it was normal. Synthesis of porphyrins from PBG was slightly increased in erythremic myelosis, but was within normal limits in polycythemia.—M. K.
ABSTRACTS


The cloning efficiency of spleens of polycythemic X-irradiated, bone marrow-treated mice was compared with that of spleens of non-polycythemic mice by recloning the spleen cells of the primary recipients in X-irradiated secondary animals. Spleens of polycythemic animals showed a higher donating efficiency than those of non-polycythemic mice. The results were interpreted to indicate that in polycythemic animals the colony-forming cells which would otherwise have given rise to erythroid clones will, in the absence of erythropoietin, replicate to form microclones of stem cells which themselves are capable of forming spleen colonies. —B. R.

MISCELLANEOUS


This monograph contains a complete review of the literature on hemopoietic cell transplantation up to early 1965. The authors supplement a wealth of information based on their own research in this field. The emphasis is placed on the comparative aspect of bone marrow transplantation in irradiated animals and man and, especially, the pathology of secondary disease. Various applications of bone marrow transplantation for hematology, organ transplantation and the treatment of leukemia are discussed.—F. J. C.


Twenty-seven previous papers, all by the author, are reviewed. The Hamburg whole-body counter has an efficiency of 65–97 per cent for point sources, 20–56 per cent for bodies, and a sensitivity of 1.5–3.5 μc with 10 per cent error in 300 sec. Thus 59Fe absorption can be studied with 0.05 to 0.2 μc, vitamin B12 absorption with 0.01 to 0.05 μc, 51Cr intestinal protein loss with 2μc, and 131I thyroid function with 0.05 μc. Radiation dosage from these doses is calculated to be only 0.1 to 1 per cent of natural and fall out radiation. (Abstractor’s comment: It seems important to reduce radiation dosages in the patients, as suggested by Heinrich. Some whole body counting methods have also been described by Anderson, Cohn, Cronkite, Crosby, Class, and others).—P. G. R.


Not even 5 μc 3H-thymidine per g body weight could be shown to cause a shortened life span or tumors.—P. G. R.


In a modified method of isolation of malignant cells from peripheral blood, streptolysin O was used to induce hemolysis. Malignant cells and single leukocytes were sedimented during centrifugation on a slide placed at 20* in a test tube.—M. K.


Five simultaneous cases were observed in children among 31 persons living together under very bad conditions. The Sabin-Feldman titer ranged between 1:16,000 and 1:128,000. From lymph nodes of two children, Toxoplasma gondii were isolated. Comments on the clinical and epidemiological features were presented.—M. J.
ABSTRACTS