ABSTRACTS

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THE HEMATOLOGICAL EFFECTS RESULTING FROM INJECTION OF RADIOACTIVE PHOSPHORUS (P³²) INTO ALBINO RATS. J. S. Latta and R. E. Waggener. From Department of Anatomy, University of Nebraska, College of Medicine, Omaha, Neb. Anat. Rec. 119: 357-385, 1954.

Considerable work has been done on total external body irradiation on the blood and blood-forming organs. Little, however, has been done concerning the effects of internally administered radioactive phosphorus. In previous experiments a small dose of P³² per body weight produced changes in the bone marrow but not in the blood. Larger doses of 4.5 μc P³²/Gm. of body weight produced changes in both. Six groups of albino rats were studied 1, 2, 3, 5, 7, 10 and 15 days after intraperitoneal injection of the isotope. Erythrocytes, hemoglobin, hematocrit, reticulocytes and leucocytes all showed progressive and marked decreases in the blood throughout the test period. The bone marrow showed a progressive depletion of cells. Fixed reticular cells showed a percentage increase during the first 10 days due to their resistance to irradiation rather than actual increase. Lymphocytes practically disappeared from the bone marrow, many of which transformed to plasma cells. The spleen and lymph nodes presented evidence of severe destruction of lymphocytes. Macrophages containing debris of fragmented cells or deposits of hemosiderin were markedly increased.—O.P.J.


Stellate, intracytoplasmic bodies have been reported in multinucleated giant cells found in a number of granulomatous inflammatory conditions. Some of their chemical and physical properties have been determined and it has been postulated by Jacques that they are formed from multiple vacuoles containing eosinophilic bodies which aggregate to form a single large vacuole and asteroid body. The present paper reports the finding of stellate bodies in neoplastic multinucleated cells in a case of plasma cell myeloma and two cases of Gaucher’s disease. Histochemical properties previously described were confirmed and additional ones reported. Stellate inclusion or asteroid bodies gave reactions indicating a protein component—which of course may have been adsorbed. The following nuclear changes result in the formation of asteroid bodies: (1) enlargement of the nucleus; (2) enlargement and increase in the prominence of the nucleolus; (3) filling of the nucleus with nonstaining material at the expense of chromatin, and (4) rupture of nuclear membrane leaving filaments and core of asteroid. Preliminary attempts have been made to produce asteroid bodies in vitro by incubating slices of fresh tuberculous renal tissue. Stellate inclusions are not specific for any disease.—O.P.J.

Seventeen cases of idiopathic aplastic anemia and eight cases of secondary aplastic anemia were submitted to a clinical evaluation of medical treatment and of splenectomy. Surgery was employed in 12 cases of the idiopathic group and in 3 of the secondary ones. Seven patients survived among the 12 splenectomized (58 per cent of the cases) for idiopathic aplastic anemia and were in satisfactory clinical and hematological condition 20 months after the operation. Of the secondary type only one patient survived and this one was not splenectomized. This single survival in the secondary type was a case of arsenic intoxication.

The authors discuss the criteria for the diagnosis, which included a rib biopsy, and the surgical technic of splenectomy in such difficult cases with anemia, leucopenia and thrombocytopenia. Soon after splenectomy, in all 15 cases operated on, there was a rise in the leucocyte, erythrocyte and even in the platelet counts.

This reaction of a bone marrow hitherto considered nonresponsive permitted the author some considerations of the role of the spleen and of immunological mechanisms in the pathogenesis of the aplasia. Of the five cases of the idiopathic type not operated on only one survived.—M.A.J.

BLOOD TRANSFUSION


Among those blood group systems recently discovered, the Kell-Cellano system should be considered to be of great practical significance. Five examples of anti-Kell antibodies were recently examined by the authors, some from transfusion accidents, others from feto-maternal iso-immunization.

A few principles are to be drawn from these cases: a) As regards to feto-maternal iso-immunization the researches should not be confined to the detection of anti-rhesus antibodies but should be extended to that of anti-Kell or any other antibodies. An early detection of iso-immunization (that is, during the first pregnancy) should be sought using the most sensitive serologic methods, especially when the woman has previously received either transfusions or heterohemotherapy. It is unwise to give transfusion to a woman before menopause or to a little girl with “Kell positive” blood, if they are “Kell negative,” just as it is unwise with rhesus blood. Whether the subject belongs to the positive or negative Kell group, one should use “compatible Kell” donors. This is possible if an adequate number of Kell-tested donors are available.

b) As regards blood transfusions one should particularly fear anti-Kell iso-immunization in polytransfused patients.

c) The cases studied have also brought out these interesting serologic data: all the discovered antibodies were active in albumin, some were active in saline.

d) The incidence of the Kell-positives in the Paris region, was 8.2 per cent, the statistical record covering 1,852 subjects.—J.D.


Eight of 10 samples of anti-Kell antibody found in an analysis of approximately 10,000 patients are discussed relative to their titer and methods of detection by cross-match procedures. It is recommended that two cross-matching procedures be used concurrently to reveal incompatibilities within the ABO, Rh and Kell systems: (1) “serum” technic (serum
The Natural History and Management of Haemolytic Transfusion Reactions.

The legal system in England, and more recently Scotland, has laid it down that hospital management committees are responsible for the professional acts of doctors working in their hospitals. Accordingly, rules couched in mandatory form have been issued by some regional boards and hospital management committees. These usually make no provision for desperate emergencies, and if hospital blood banks obeyed some of the rules suggested, no blood might be available for two or three hours with consequent death of the patient. It is not the function of an administrative body such as a management committee to issue mandatory instructions on technical matters, and no consultant should accept such instructions unless he knows who was the expert or group of experts who drew them up.

Three cases of haemolytic transfusion reactions are described and fourteen are reviewed: 3 had no discoverable cause, 4 were due to administrative mistakes, 6 were due to laboratory or technical error, and 1 was apparently due to donor antibodies. There was 1 death and 1 case of anuria. The surprising quality of 10 reactions due to incompatible transfusions with demonstrable serological cause was their mildness. In the 3 with no apparent serological error, symptoms were severe and 1 died.

There is put forward the hypothesis that the excretion of hemoglobin in itself is virtually innocuous: most patients subjected to a hemolytic transfusion reaction are little inconvenienced and are unlikely to develop anuria: a few with previously damaged kidneys or a biochemical disorder such as dehydration or alkalosis that impairs renal function may develop anuria without shock or hypotension and may die: a very few will show an allergic response, develop hypotension and oliguria or anuria and die rapidly. There is probably no place for intravenous sodium sulphate or sodium lactate. Most patients recover spontaneously, but if hypotension and shock persist it appears reasonable to try the effect of pressor drugs, and perhaps an antihistamine. Anuria should be treated by the Bost-Bull regime.


In this useful and comprehensive account of the possible dangers of blood transfusion the author stresses the importance of a 24-hour, 7-day service for transfusion work. The possibility of there being two patients of the same name in the same ward must be remembered. In one instance a nurse was told the blood had been cross-matched for melena. It was given in error to a patient named Melina.


Dextran in serum makes cross-matching difficult because of rouleau formation. There was administered ½ to 2 bottles of dextran to 14 patients, 13 of whom were group O and rhesus positive. Minor rouleau formation occurred in 3, and major formation in 3. This was quite distinct from agglutination. Where difficulty arises in cross-matching blood in patients who have been given dextran, a reliable technic has already been described by Dodge (J. Clin. Path. 8: 102, 1952).—R.H.G.


Plasma was irradiated in an apparatus designed on the Habel-Sockrider principle using a flow rate of 3 liters per hour with an ultraviolet emission of 5.5 watts at 2537 Å. 15 liter
pools from approximately 60–80 donors were filtered and were run through the irradiator in continuous sequence. Of 2,538 patients transfused with blood, 4 (0.16 per cent) developed homologous serum jaundice and 4 developed jaundice of doubtful etiology. After dried small-pool plasma with or without blood, 1 out of 867 recipients developed homologous serum jaundice. Following the giving of dried irradiated large pool plasma with or without blood to 984 recipients, 39 (3.96 per cent) developed this complication and 5 developed jaundice of doubtful etiology.

Pools of kaolin-treated filtered liquid plasma from not more than 140 donations of blood were kept at room temperature for three weeks or less and used for transfusion. Of 1,387 in this series given blood alone, 5 (0.36 per cent) developed homologous serum jaundice and 3 developed jaundice of doubtful etiology. Of 1,366 given kaolin-treated filtered plasma, 16 (1.17 per cent) developed homologous serum jaundice and 8 developed jaundice of doubtful etiology.—R.H.G.

METHODS


Some staining reactions for acid mucopolysaccharides are true histochemical reactions while others are purely empirical. Tinctorial methods for mucin are supposed to be equivalent so far as their specificity and sensitivity is concerned. The work reported in the present paper tested these points on a wide variety of tissues. The mast cells stood out in a brilliant metachromatic shade when stained with toluidine blue; they were stained a slightly purplish blue-black by celestin blue; colloidal iron and alcian blue stained them fairly intensely. They were unstained by mucicarmine.—O.P.J.


In recent years, new morphological studies were made either with more specific stains or by means of the phase-contrast or electronic microscope. The author comes back to the older dark field method. He demonstrates its advantages, especially in studies of mitochondria, reticulocytes, Heinz inclusion bodies, and certain processes of the production of platelets.—C.M.


The authors present a thermal method (originally reported by J. J. van Laghem, Maand. schr. v. kindergeneesk. 18: 115–126, 1950) for removing heterohemagglutinins for human red cells from unabsorbed anti-human serum rabbit serum. Their results indicate that heating such serum, diluted 1:10 with physiologic saline, at 70 C. for 60 minutes eliminates the interfering hemagglutinins to human red cells without materially affecting the specificity or stability of the anti-human serum antibody. This technic eliminates the laborious and unpredictable absorption procedure commonly used in the preparation of anti-human globulin (Coombs) serum.—J.H.A.

MEGALOBLASTIC ANEMIA


Twenty-eight cats submitted to a purified diet, with sulfadialidine or sulfaguanidine and supplemented by synthetic vitamins, without PGA, in 3–6 months developed anemia, leukopenia and weight reduction. There was a weight reduction of the order of 30 per cent,
a leukocyte diminution of 60 per cent and an erythrocyte fall of about 40 per cent of the original values. The anemia was, in the majority of the animals, of the macrocytic type. There was an increase in the plasma iron content in the anemic cats with very low levels of bilirubin and without any deviation of the resistance of the erythrocytes to hypotonic saline solutions.

The above mentioned signs of the experimental deficiency were satisfactorily corrected by adequate doses of PGA. For a single dose the minimum required was 1-2 mg. Fuller responses were obtained with 5 or more mg. per animal. The deficiency was also corrected with PTGA and folinic acid.

The sulfa was required for the development of the deficiency. The increase of the plasma iron level was probably due to saturation of the ferritin system.

The animals responded better when PGA was given with liver extract or vitamin B12.

M.A. J.

RAPID ESTIMATION OF THE SERUM VITAMIN B\textsubscript{12} LEVEL BY A MICROBIOLOGICAL METHOD.

Measurement was by a \textit{L. leichmannii} growth method, turbidity being estimated after incubation for 16 hours. In 34 cases of pernicious anemia in relapse the reading was less than 130 \textmu g./ml.: in 2 it exceeded this figure. In 22 cases of megaloblastic anemia from other causes the reading was from 140 to 440 \textmu g. It was less than 130 \textmu g. in two patients who had developed macrocytic anemia after partial gastrectomy, and in one with idiopathic steatorrhea. In two patients with clinical features and peripheral blood counts suggesting pernicious anemia but a normoblastic marrow, the level was 30 \textmu g. Both responded to cyanocobalamin therapy. One of these, who had been given folic acid therapy six months previously, had subacute combined degeneration of the cord. In 47 control cases the level was between 140 and 870 \textmu g.

In practically all cases of megaloblastic anemia the diagnosis of its nature may be established by estimation of the serum vitamin B\textsubscript{12} level together with the differential urinary folic acid excretion test (Lancet 2: 53, 1953). The serum vitamin B\textsubscript{12} level does not necessarily give information about the extent of depletion of body stores of vitamin B\textsubscript{12}, and it is likely that, in pernicious anemia, megaloblastic anemia is a \textit{late} manifestation of generalized deficiency of vitamin B\textsubscript{12}.—R.H.G.


Megaloblastic anemia with free hydrochloric acid in the stomach and a normal gastric biopsy occurred in a 52 year old man who was being treated with phenytoin sodium for epilepsy. Reference is made to three other cases in patients receiving anticonvulsant drugs. A fat balance test showed 94 per cent absorption, chylomicrography gave a low normal result, and a glucose tolerance test gave a high normal curve. Folic acid absorption was not tested. Liver function was essentially normal. A cyanocobalamin injection did not give a red cell rise but there was a response to pteroylglutamic acid given by mouth despite the continued administration of epanutin.—R.H.G.

HEMOSTASIS


In a letter to the British Medical Journal, the Secretary of the Medical Research Council announces that the Medical Research Council, the Ministry of Health and the Department of Health for Scotland have jointly prepared a card for issue to those suffering from hemophilia and closely related diseases. Fourteen reference centers have been set up in Britain to investigate alleged cases of hemophilia and to issue the cards which give the diagnosis and the name of the patient’s physician and hospital. Information is also given
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about transfusion, blood grouping and abnormal antibodies. A central register is to be maintained.—R. H. G.


The clinical and laboratory findings in six male patients suffering a disorder which resembles hemophilia are presented. The disorder is shown to be due to a deficiency of a factor essential for thromboplastin formation in shed blood. The authors have called this factor B-prothromboplastin, in contrast to A-prothromboplastin, which is lacking in hemophilia. The condition is identical with the condition described by other workers as PTC deficiency and Christmas disease. The authors give reasons for their preference for the term B-prothromboplastin deficiency. Technics for the detection of thromboplastin precursors and data showing the degree of blood deficiencies in the six patients are presented.—G.C. de G.


In a five year old boy of Jewish extraction, a hemophilic syndrome was observed. Hemorrhagic symptoms started at the age of 6 months and were characterized by hematomas, ecchymosis, rare petechiae, hematuria. Diagnosis of hemophilia B (PTC-deficiency, Christmas disease) was made on the basis of crossed coagulation tests.—P.d.N.


A case of hemophilia-like disease occurring in a 62 year old Chinese woman is described. The disorder is due to a circulating anticoagulant which is stable on heating and on storage. It is not an antithrombin or an antithromboplastin. It acts at an early stage of coagulation, possibly by inhibiting platelet factor. The literature on this type of anticoagulant is briefly reviewed.—G.C. de G.


The correlation between capillary fragility and clinical patterns was investigated in 323 cases of hypertension. In 72.7% of the cases there was an abnormal capillary fragility test, as measured by means of the modified Wright-Lilienfeld method. A strong statistical correlation could be established between the subjective complaints and the degree of capillary fragility. The age of the patients did not seem to be significant in this connection. No correlation was found between the occurrence of cerebral vascular complications and the capillary fragility.—P.d.N.


A detailed method for making platelet suspensions for typing, using a 10 per cent solution of 1 per cent disodium Sequestrine and 1 per cent Triton W.R.1339 in 0.7 per cent sodium chloride as an anticoagulant is presented. The authors demonstrate ABO groups in platelets by agglutination with anti-sera from healthy donors. Platelet grouping was paralleled with red cell typing. The A and B antigens in platelets and red cells were further demonstrated by absorption of specific antisera, by inhibition of isoagglutinins by secretor saliva and by neutralization of isoagglutinins with blood group A and B substances.—J. H. A.
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THROMBOHEMOLYTIC THROMBOCYTOPENIC PURPURA. E. Adelson, E. Heitzman, and J. F. Fennessey. From the Ziskind Laboratories of the Joseph H. Pratt and New England Center Hospital; the Department of Medicine, Tufts College Medical School, and the Pathology Laboratory of the New England Medical Center. Arch. of Int. Med., 94: 42-61, 1954.

The pathognomonic histologic finding of thrombohemolytic thrombocytopenic purpura consists of a homogeneous eosinophilic material partially or completely occluding arterioles, capillaries, and occasionally venules in various organs of the body. The precise nature of this eosinophilic material has not been determined with absolute certainty. In addition, focal degenerative and destructive changes have been recognized in the vessel walls with or without aneurysmal dilatations, probably representing primary vascular lesions. Damage of the endothelium and degeneration of the subendothelial ground substance may give rise to the presence of this eosinophilic substance within the vessels which may represent extruded intramural material with superimposed platelet thrombi. The thrombocytopenia is believed to be due to increased destruction of platelets as well as to decreased production as suggested by morphologic changes in the megakaryocytes. No platelet autoagglutinins or isoagglutinins were found, nor could auto-antibodies against red cells be demonstrated. The disease was considered to represent a hypersensitivity state involving red blood cells, platelets, megakaryocytes and vessel walls.—H.R.


A clinically typical case of thrombotic thrombocytopenic purpura is reported because of special histologic features. At post mortem examination, which was restricted to the abdominal organs, the characteristic thrombotic lesions were found in the renal cortex and in the hepatic portal system. The principal vessels affected were the venules, which is in contrast to previous reports in which the changes have been found only in capillaries and terminal arterioles.—H.R.