583

AUTOIMMUNE PANCYTOPENIA IN IDENTICAL TWINS WITH SINUS HISTIOCYTOSIS George R. Buchanan, Arthur G. Weinberg & Mary K. Sawyer, (intr. by George H. McCracken), Univ. of Tex. Health Sci. Center at Dallas, Dept. of Pediat. & Path., Dallas

Eight-year old black male identical twins have similar 4½-year histories of lymphadenopathy and hepatosplenomegaly. Initial lymph node biopsies showed reactive hyperplasia, but more recent biopsies are diagnostic of sinus histiocytosis with massive lymphadenopathy, as described by Rosai and Dorfman. Initial hematologic and immunologic parameters were normal except for polyclonal gammopathy, but both boys subsequently developed mild pancytopenia (neutrophils 200-1000/ μ l, platelets 50-150,000/ μ l, Hct 27-32%) with hypercellular bone marrows. One has developed corticosteroid-responsive episodes of severe thrombocytopenia (platelets 4,000/ μ l) and symptomatic hemolytic anemia (Hct 20%). Both boys have positive direct antiglobulin tests and demonstrable anti-platelet and anti-neutrophil antibodies in their sera, suggesting that their pancytopenia is immunologically mediated. Anti-nuclear antibody is absent. Circulating T-cell numbers assessed by E rosettes are depressed, but there are no identifiable abnormalities in number of B-cells or in responsiveness of their lymphocytes to mitogens. Family history is negative and there have been no known exposures to toxic infectious or chemical agents. However, Epstein-Barr virus antibody titers are markedly elevated in both boys. These patients appear unique since sinus histiocytosis has not previously been described in siblings or in association with a possible immunoregulatory defect leading to immune-mediated blood cell destruction.

586

GLYCOLYTIC ENZYME DEFICIENCY IN NEONATAL GRANULOCYTES Hsin Chang, James R. Humbert, and Sotou Ishida, State University of New York at Buffalo, The Children's Hospital of Buffalo, Department of Pediatrics, Buffalo

Newborn infants are known to be particularly susceptible to infections. Various contributing factors have been implicated including defective chemotaxis and phagocytosis of their neutrophils. The energy required for these two neutrophil functions is derived from A.T.P. produced from glycolysis. Decreased granulocyte glycolytic enzyme activity may impair chemotaxis and phagocytosis due to decreased energy supply. Eight granulocyte glycolytic enzymes were studied in 15 adults and 15 full-term newborns. Placental cord blood was drawn immediately after the delivery of placenta, and granulocytes were isolated within 20 minutes of delivery by Ficoll Hypaque centrifugation. Venous blood from adult volunteers was processed at the same time. The activity of glucose-6-phosphate dehydrogenase, enolase, and phosphofructokinase was significantly lower in cord-blood granulocytes compared to that of the adult volunteers ($P < 0.01$). Phosphoglycerate kinase activity was also lower in cord blood ($0.01 < P < 0.05$). The activity of 6-phosphogluconate dehydrogenase, pyruvate kinase, hexokinase, and glucose phosphate isomerase were lower in cord blood but not to a significant level. Whether the decreased activity of these glycolytic enzymes contributes to the previously reported impaired phagocytosis and chemotaxis and hence the increased susceptibility to infections is open to question.

584

PROLONGED ISOLATED THROMBOCYTOSIS IN INFANTS OF POLY-DRUG ABUSERS. Yoav Burstein, Patricia J. Giardina, Aaron R. Rausen, Stephen R. Kandall, Yun J. Lee, Karin Siljeström, Mount Sinai School of Medicine, Beth Israel Medical Center, Dept. of Pediatrics, New York.

Nineteen infants of mothers using methadone plus other drugs developed significant thrombocytosis for more than 16 weeks. These prospectively studied newborns had varying degrees of withdrawal during the first week of life; one had seizures. All were formula fed. As part of a study, 10 received paregoric, 3 phenobarbital and 6 no drugs. Complete blood counts were done every 3 to 7 days in hospital and weekly after discharge. Platelet counts in the first week were the same in both study (mean $258,000 \pm 18,000/\text{mm}^3$ S.E.M.) and control ($255,000 \pm 40,000$) infants. Maternal platelet counts were all normal. By the second week there was significant thrombocytosis in study ($521,000 \pm 68,000$) versus control ($240,000 \pm 45,000$) infants ($p < .001$). Thrombocytosis persisted with a further significant increase at 10 weeks of age ($745,000 \pm 97,000$) ($p < .05$), platelets exceeding 1,000,000 in 4/19. Thrombocytosis was comparable regardless of treatment. All serial blood counts aside from platelets were normal. Marrow hypermegakaryocytosis suggests overproduction as the mechanism. Thrombocytosis appears to be related to postnatal changes associated with withdrawal and not to treatment. Thrombocytosis may be a factor in the pathogenesis of focal infarcts, and subarachnoid plus germinal plate hemorrhages described in some infants of addicted mothers, and thus may relate to potential long term sequelae in survivors.

587

LEUKOCYTOSIS, MONOCYTOSIS AND INCREASED PERIPHERAL BLOOD COLONY STIMULATING ACTIVITY (CSA) IN SICKLE CELL DISEASE. Robert R. Chilcote, Deborah Bleeke, Dianne Gallagher, Amanda Tuley (Spon. by Marc O. Beem), Pritzker School of Med., Univ. of Chicago Hospitals and Clinics, Dept. of Pediatrics, Chicago

The leukocytosis of sickle cell disease has not been well characterized. Monocytes are a source of CSA, a leukopoietin active in the control of granulopoiesis *in vitro*. We subjected hematologic parameters to statistical analysis and assayed peripheral blood CSA in stable patients free of crisis or serious infection. Two $\times 10^5$ normal marrow cells were layered over 1×10^6 patient or control feeder leukocytes in agar and colonies of > 50 cells enumerated at 14 days. Patient absolute granulocyte counts and monocyte counts were elevated compared to controls (AGC = $6000 \pm 3200/\text{mm}^3$, AMC = $790 \pm 640/\text{mm}^3$). Myeloid and erythroid precursors were infrequent ($< 1\%$). There was no association between AGC and Hb or reticulocyte levels ($p > 0.1$). However, AGC and AMC were highly correlated ($r = .5$, $n = 154$, $p < 0.001$). CSA production by 10 patients was nearly two-fold that of paired controls (95 vs 63 colonies/ 2×10^5 marrow cells, $p < 0.001$). Feeder layers from which monocytes were removed by surface adherence lost 88% of their activity. We conclude that leukocytosis in HBSS is not correlated with erythrocyte production or indiscriminant marrow release but is associated with monocytosis and elevated CSA production.

585

EFFECT OF LOW DOSE IRRADIATION ON SUBSEQUENT RENAL HYPERTROPHY IN CHILDREN WITH WILMS' TUMOR. James R. Cassidy, Norman Jaffe, Robert L. Lebowitz, and Alan Hoffman (Spons. by David G. Nathan). Harvard Medical School, Joint Center for Radiation Therapy, Sidney Farber Cancer Institute, and Children's Hospital Medical Center, Departments of Radiation Therapy, Pediatrics, and Radiology, Boston.

The effects of irradiation (XRT) combined with multiagent chemotherapy (CT) on compensatory renal hypertrophy following nephrectomy in childhood have received little attention. Treatment details and serial intravenous urograms in 30 children with Wilms' tumor subjected to nephrectomy and postoperative XRT and/or CT were reviewed. Eleven children received whole abdomen XRT (WAXRT) which delivered 1200-1300 rad to the remaining kidney. Nineteen patients were given no initial irradiation to the remaining kidney (OXRT) with 17 receiving renal fossa treatment only and 2 no irradiation. Renal growth, assessed by serial cephalocaudal measurements in treated patients, was plotted and compared to previously published figures of normal growth as well as hypertrophy following nephrectomy for benign causes in childhood. The mean and median slope of renal growth for the WAXRT group was 0.50 and 0.37 respectively while it was 0.56 and 0.50 for the OXRT group. The cumulative slope for the WAXRT group was 0.43 versus 0.55 for the OXRT group. When children who required subsequent pulmonary irradiation which necessarily irradiated the upper portion of the kidney were excluded from the OXRT group, the cumulative slope increased to 0.62. These results suggest a possible effect of low dose irradiation on renal hypertrophy.

588

COLONY-FORMING-CELL IN BONE MARROW AND PERITONEAL EXUDATE OF ISOGENIC CHIMERAS. Jen-Yih Chu (Spon. by Patricia L. Monteleone) St. Louis University School of Medicine, Department of Pediatrics, St. Louis, MO.

Mouse peritoneal or pleural exudate induced by injection of various stimulants contain cells that are capable of clonal growth of macrophage colonies *in vitro*. However, cells obtained from unstimulated peritoneal or pleural cavities had none or very few such colony-forming cells (CFC). These peritoneal exudate CFC differ from that of bone marrow CFC by having a longer period before proliferation and producing only macrophage colonies. AKR mice were given a lethal dose of total body radiation (900 rads) and then received intravenously 5×10^6 nucleated marrow cells from unirradiated mice. Peritoneal exudate was induced by injection of 1.5 ml thioglycollate medium 3 days before collection of exudate. Repopulation of CFC from both bone marrow and peritoneal exudate was then assayed. Exponential growth of CFC in bone marrow was noted between 3-10 days and then reached gradually to unirradiated levels in 5 weeks. The growth curve of these marrow CFC measured by this *in vitro* culture method is similar to that of CFC assayed by the *in vivo* spleen colony method. However, no measurable CFC in peritoneal exudate was noted in the first 7 days. The growth curve of peritoneal CFC is similar to that of marrow CFC after 2 weeks. A close relationship of CFC between bone marrow and peritoneal exudate seems to exist. However, the origin of these peritoneal exudate CFC either as "activated" peritoneal cells or migrated cells from bone marrow is still unclear.