601 CENTRAL NERVOUS SYSTEM (CNS) PROPHYLAXIS IN ACUTE LYMPHATIC LEUKEMIA (ALL) - SPINAL FLUID THROMBOPLASTIC ACTIVITY (TA) AS AN INDICATOR OF CNS INJURY. Janet E. Graeber and Marie J. Stuart. Dept. of Ped., SUNY, Upstate Med. Ctr., Syracuse, N.Y.

Intrathecal methotrexate and cranial irradiation are used as prophylactic therapy in children with ALL. This regimen is recognized to produce undesirable side effects. In an attempt to monitor the possible injurious effects of these agents, a test was developed for the measurement of spinal fluid TA (Ped. Res. 10:376, 1976). In 10 patients (6 mos. to 16 yrs.), spinal fluid TA was measured sequentially from the time of diagnosis. Initial TA was similar to that of age matched controls. During CNS prophylaxis a significant increase in TA was observed, from an initial mean of 18% ± 7.5(SD) to 37.5% ± 11.5. 3/10 later developed the post-irradiation syndrome. Activity in these 3 was significantly higher (57.7% ± 7.6) than the remainder of the group (32.8% ± 7.6). TA was also measured in an additional 32 patients with ALL. The mean results of all patients studied are listed below.

AGE	AT DIAGNOSIS	DURING CNS Rx	6 mos-2 yrs.	>2 yrs.
< 2½ yrs.	24.5 (2)	61.6 (2)	40.0 (2)	40.3 (4)
2½-16 yrs.	18.2 (9)	36.1 (14)	31.5 (13)	21.5 (11)

TA was significantly increased during CNS therapy. The increase was most marked in children under 2½ years and persisted for a longer period. Spinal fluid TA is a sensitive technique for monitoring CNS injury. The findings also suggest that current CNS treatment for the younger patient may be excessive.

602 THE EFFECTS OF VITAMIN E ON HEMOLYSIS IN PREMATURE INFANTS DURING THE FIRST WEEK OF LIFE. Steven J. Gross, Stephen A. Landaw and Frank A. Oski. SUNY, Upstate Medical Center, Syracuse, New York.

Although it is recognized that vitamin E deficiency may be associated with a hemolytic anemia in premature infants at 6 to 10 weeks of age, no information is available to indicate if the vitamin E deficiency normally present at birth has hematologic consequences. A study was designed to determine if the presence of vitamin E deficiency during the first week of life played a contributory role in the shortened red cell lifespan observed in the premature infant. Carboxyhemoglobin values were used as an index of hemolysis. Ten healthy, preterm infants received intramuscular vitamin E in a total dose of 125 mg/Kg during days 3 to 7 of life and ten infants served as controls. The percent carboxyhemoglobin levels fell significantly from day 3 to day 8 in the treated group (1.08% to 0.78%) while the mean value remained unchanged at 0.96% in the control group. The administration of vitamin E during the first week of life appears to reduce, but not eliminate, the accelerated red cell destruction that is characteristic of the premature infant.

603 HYPERVISCOSITY IN THE SMALL-FOR-GESTATIONAL AGE INFANT. David O. Hakanson, and William Oh. Brown University Program in Medicine, Women and Infants Hospital of R.I., Department of Pediatrics, Providence, R.I.

SGA infants are prone to hyperviscosity but the precise incidence is unknown. A prospective survey was conducted on 4,794 consecutive livebirth for hyperviscosity in SGA infants. SGA is defined as birth weight below the 10th percentile of intrauterine growth curve and signs of malnutrition; and hyperviscosity as venous blood viscosity (measured by micro-viscometer) above the 2 S.D. of the norm. 79 infants were identified as SGA and of these, 14 were hyperviscous (HV) and 65 were normal viscous (NV). The venous hematocrit range from 64-70% in HV and 37-62% for NV. A pre-defined symptom complex referable to cardiovascular, respiratory, gastrointestinal, and central nervous systems were assessed by 2 unbiased observers; 57% of HV and 25% of NV infants were symptomatic ($p<.05$ by Chi square). The data indicated that HV occur in 17.7% of SGA infants; venous hematocrit (>64%) is predictive of HV; and that in spite of a positive correlation between symptom complex and HV, there is a lack of specificity for the clinical manifestation of HV.

604 TWO MOLECULAR SPECIES OF PROTOPORPHYRIN IN LEAD INTOXICATION AND IRON DEFICIENCY ANEMIA; David A. Hart, Sergio Piomelli, Joseph H. Graziano; Departments of Pediatrics, NYU Medical Center and NY Hospital-Cornell Medical Center, New York, N. Y.

In iron deficiency anemia (FeDA) and lead intoxication (Pbl) the final step in heme synthesis is deranged in such a manner that protoporphyrin (PP) accumulates within the red blood cells. A Zinc-PP chelate (ZnPP) is the primary species of PP present in these conditions. By fluorescent spectra we have found some free (unchelated) PP in addition to ZnPP in the rbcs of children with FeDA and Pbl. In fact, in one child with acute FeDA the predominant species present was free PP, and this PP was changed to ZnPP during the course of treatment. Sequential studies of lead-poisoned rats show that PP in the peripheral blood increases rapidly (within a week of exposure) and that initially free PP is the predominant species; as exposure continues ZnPP becomes more prominent. Density gradient separation of these rbcs reveals that the youngest cells contain a large amount of PP, which is mainly free, while the older cells contain predominantly ZnPP. Therefore, in the rat the proportion of ZnPP to free PP increases in the rbc, both with chronic lead exposure and with increasing cell age. These data indicate that in Pbl and FeDA the PP produced in the rbcs is initially free PP which subsequently chelates zinc.

605 IMMUNOCHEMICAL DIAGNOSIS OF HEMOGLOBINOPATHIES IN THE FETUS AND NEWBORN INFANT. Verle E. Headings, Stephen I.O. Anyaibe, Syama P. Bhattacharya, and Ernest L. Hopkins. Howard University College of Medicine, Department of Pediatrics and Child Health, The Center for Sickle Cell Disease, and Department of Obstetrics and Gynecology, Washington, D.C.

The specificity, sensitivity, and operational simplicity of single cell immunodiffusion and radial immunodiffusion offer advantages for diagnosis of hemoglobinopathies in the fetus and infant. Red cells from maternal venous blood and from the fluid obtained by amniocentesis at 16-18 weeks of gestation were radiolabeled with ^{14}C-serine in vitro. These cells were incubated with fluoroscein-labeled specific antibodies for hemoglobins A, S, F, and prepared for autoradiography. On the basis of F-cell frequency alone, 76% of amniotic fluid specimens were estimated to contain fetal red cells. Diagnosis of hemoglobin phenotypes was made in synthetically active cells, as identified with appropriately controlled autoradiography, by fluorescence microscopy.

Hemoglobins A, S, C in cord blood of term infants were identified and quantified on an agar plate containing a mixture of specific antibodies for the three hemoglobins. By appropriate adjustments in the respective antibody concentrations nonoverlapping immunoprecipitin rings were obtained. This allows diagnosis of any major sickling phenotype from a single application (5 µl) of lysed whole blood to the plate.

Both of these diagnostic tools are now under extensive evaluation in a large population sample.

606 REGULATION OF ERYTHROPOIESIS DURING ERYTHROBLASTIC CRISIS OF JUVENILE CHRONIC MYELOCYTIC LEUKEMIA (JCML) Ronald Hoffman and Esmail D. Zanjani, (Spon. by Lillian Y. F. Hsu), Mount Sinai Sch. of Medicine, New York, N. Y.

A 3 1/2 year-old child with Ph^1 chromosome-negative JCML who developed an erythroblastic rather than a myeloblastic phase was studied with reference to whether or not the megaloblastic erythropoiesis was subject to normal control mechanisms. Suppression of erythropoietin production by transfusion therapy resulted in a significant reduction in the morphologically identifiable nucleated erythroid precursors in marrow and in blood reticulocytes. Both before and after transfusion therapy, bone marrow cells of this child were cultured in plasma clots in the presence or absence of 2 IU erythropoietin. In addition, 5 hematologically normal individuals (N) and 4 adults with erythroleukemia (EL) were studied. Bone marrow cells from JCML and N generated erythroid colonies in the presence of erythropoietin. By contrast, bone marrow cells from all 4 patients with EL failed to form colonies in the plasma clot. The pre-transfusion marrow from JCML formed significantly greater number of colonies than N (1320 ± 72 vs 789 ± 82 / 6 x 10^5 cells). The number of erythroid colonies formed by JCML marrow was markedly diminished following transfusion therapy (1320 ± 72 vs 891 ± 88 / 6 x 10^5 cells). These results suggest that unlike EL, the erythroid precursor elements in JCML remain responsive to normal physiological control mechanisms. In this regard, EL and JCML may represent qualitatively different defects in the hematopoietic stem cells.