914 COMPARISON OF HUMAN NEONATAL POLYMORPHONUCLEAR LEUKOCYTE (PMNL) AND MONOCYTE (MN) ACTIVITY FOLLOWING VAGINAL (V) AND C-SECTION (C-S) DELIVERIES. Johnnie Frazier, Tom G. Cleary, Larry K. Pickering, Steve Kohl, and Patti Ross The Univ. of Tex. Med. School at Houston, Tex., Dept. of Ped. & Prog. Inf. Dis.

Oxidative metabolic and functional activities of Ficoll-Hypaque separated PMNL and MN from 35 cord blood specimens were evaluated: 15 term infants delivered by C-S without labor, 5 C-S with labor and 15 V. Healthy adults were controls. Absolute PMNL counts ($\times 10^3/mm^3$) of V and C-S with labor cord bloods were significantly higher (7.1± 0.9) when compared to C-S without labor cord bloods (3.5±0.4, $p<0.01$) and controls (4.0 ±0.3, $p<0.001$). Stimulated 0_2 consumption ($\mu l\ 0_2/5 \times 10^6$ PMNL/15 min) was significantly lower in V and C-S with labor cord PMNL (7.6±1.1) than in the C-S without labor cord PMNL (16.5±1.6, $p<0.005$) or control PMNL (15.2±1.0, $p<0.001$). Zymosan stimulated HMPS activity (CPM/10^6 PMNL) was significantly lower in V and C-S with labor cord PMNL (1,631 ±171) than in the C-S without labor cord PMNL (2,613±131, $p<.05$) and control PMNL (2,254 ±132, $p<0.05$). Quantitative NBT dye reduction (OD 515 nm/15 min/2.5 x 10^6 PMNL) was lower in V and C-S with labor cord PMNL (.358 ±.04) when compared to C-S without labor cord PMNL (.416 ±.05) or control (.417±.05). Metabolic activity of PMNL did not differ significantly between controls and C-S without labor. Using ^{3}H methyl thymidine labeled S. aureus as the test organism, bacteria were more sluggishly internalized by V or C-S than control PMNL. Stimulated HMPS activity was lower in V cord MN (832±84) compared to C-S without labor cord MN (1291±31) or control (1053±51). These studies indicated that oxidative metabolic and functional activities of neonatal PMNL differ significantly between V, C-S with labor and C-S without labor.

● **915** DEFICIENCY OF HELPER T CELLS IN TRANSIENT HYPOGAMMAGLOBULINEMIA - Raif S. Geha, Fuad Mudawwar, Fred S. Rosen and R. Lawrence Siegel. Department of Pediatrics, Harvard Medical School and Children's Hospital Medical Center, Boston, MA 02115.

Ten infants with transient hypogammaglobulinemia were studied to define the cellular basis of their IgG deficiency. The number of circulating B cells were assessed by direct immunofluorescence and was normal in all 10 children. The capacity of mononuclear cells to secrete IgG and IgM following in vitro stimulation with pokeweed mitogen (PWM) was assessed using a reverse hemolytic plaque forming cell (PFC) assay. Cells from all 10 children were deficient in their capacity to generate IgG PFC (1004 ± 543/10^6 cells vs. 6542 ± 5614/10^6 cells for normal controls; $p<0.01$) but not IgM PFC. T cells and their subsets were enumerated using monoclonal antibodies to T cells (T3), helper/inducer T cells (T4), and suppressor/cytotoxic T cells (T8). All ten patients were found to be selectively deficient in T4+ cells (19.6 ± 5.1% vs. 37 ± 4% for normal controls; $p<.01$) but not in T3+ cells or T8+ cells. The capacity of the patients' mononuclear cells to release T cell helper factor (a polyclonal B cell activator) following stimulation with PWM and tetanus toxoid antigen was markedly decreased compared to normal controls. Coculture of patients' and parental lymphocytes did not result in suppression of IgG synthesis (mean observed value 134 ± 59% of expected value).

These results suggest that a deficiency of helper T cells underlies the IgG deficiency in transient hypogammaglobulinemia of infancy.

● **916** IMMUNOREGULATORY ABNORMALITIES IN KAWASAKI DISEASE - Raif S. Geha, Lawrence Siegel, Alan Krensky, Stafford Grady, Richard Meade, Fred S. Rosen and Donald Leung. Harvard Medical School, Children's Hospital Medical Center and Tufts University, Department of Pediatrics, Boston, MA.

Immunoregulatory status was assessed in 14 children during the acute phase of Kawasaki Disease (KD) and in 6 of these children following recovery. T cell subsets were enumerated using monoclonal antibodies which define antigens on peripheral T cells (T3), helper/inducer T cells (T4), and suppressor/cytotoxic T cells (T8). Patients with acute KD had a significant reduction of circulating T8+ cells (11 ± 4% vs. 22 ± 4% for normal controls; $p<0.001$) but not of T3+ or T4+ cells. The number of circulating lymphocytes engaged in the spontaneous secretion of IgG and IgM was assessed using a reverse hemolytic plaque forming cell (PFC) assay. KD patients had significantly elevated number of spontaneous IgG-PFC (6523 ± 7164 PFC per 10^6 cells vs. 2.2 ± 4 PFC per 10^6 cells for normal controls; $p<0.01$) and IgM-PFC (2515 ± 1752 PFC per 10^6 cells vs. 22 ± 21 PFC per 10^6 cells for normal controls; $p<0.001$). Finally, the cytotoxicity of mononuclear cells against Cr-51 labeled normal human skin fibroblasts was determined. Patients with KD exhibited significantly greater cytotoxicity (20.5 ± 15.6% Cr-51 release) than normal controls (10.2 ± 1.1% Cr-51 release; $p<0.025$). In 6 patients studied 6 to 8 weeks after resolution of their clinical symptoms, each of the above abnormalities had either completely or partially resolved.

The above immunoregulatory abnormalities observed in the acute phase of KD may play a role in the pathogenesis of the disease.

● **917** SEVERE COMBINED IMMUNE DEFICIENCY DISEASE - A T-CELL DISORDER. Erwin W. Gelfand and Hans-Michael Dosch, Division of Immunology, Hospital for Sick Children, Toronto, Canada.

Severe combined immune deficiency disease (SCID) represents a spectrum of disorders characterized by the inability to manifest normal cell-mediated and humoral immunity. Recognition and grouping of these variants of SCID are important in order to provide guidelines for investigation and to evaluate and select appropriate therapeutic modalities. In contrast to earlier suggestions that these patients manifest abnormalities of lymphoid stem cells, our studies have demonstrated T and B-cell precursor cells in the majority of SCID patients. We have used in vitro assays for monitoring the induction of T-cell differentiation and have characterized the responsiveness of patient precursor T-cells to specific induction regimens including contact with thymic epithelium, epithelium conditioned medium, thymosin and theophylline. In this way, we have identified different groups of patients with an arrest of T-cell differentiation at different stages of maturation. In most of the patients with normal adenosine deaminase, the combined immune deficiency could be shown to reflect the failure of normal T-cell differentiation and consequent failure of T-cell dependent maturation of B lymphocytes to an antibody-secreting stage, rather than intrinsic abnormalities of the B cells themselves. These data emphasize the thymic dependence of specific B-cell differentiation in man and demonstrate the functional integrity of B lymphocytes in many patients with SCID.

918 SERUM ANTIBODY DECLINE IN SPLENECTOMIZED CHILDREN AFTER PNEUMOCOCCAL VACCINATION. G.S. Giebink, Univ. of Minnesota School of Medicine, Minneapolis, and G. Schiffman, SUNY, Downstate Medical Center, Brooklyn.

Splenectomized children are at increased risk of overwhelming pneumococcemia. Polyvalent pneumococcal vaccines may prevent these life-threatening infections since these patients have a normal antibody response to pneumococcal vaccination (Giebink, et al, JID 141:404, 1980). To determine the persistence of antibody elevation, serum was obtained from 44 splenectomized children 6 and 12 months after vaccination; 28 children had their spleens removed for traumatic splenic laceration, 11 for hereditary spherocytosis and 5 for Hodgkin's disease staging. Four weeks after vaccination geometric mean antibody concentrations, measured by radioimmunoassay against 12 antigens contained in the vaccine, were 833, 1,113 and 477 ng antibody N/ml for the traumatic, spherocytosis and Hodgkin's patients, respectively. Antibody levels after vaccination of 12 age-matched normal children and 6 children with hereditary spherocytosis with intact spleens were 492 and 954 ng/ml, respectively. Rates of antibody decline in the splenectomized patients were linear, and one year after vaccination were 68.4%, 70.6% and 76.0% of the peak post-vaccination antibody concentration in the three patient groups. None of the traumatic or spherocytosis patients had antibody levels less than 200 ng/ml one year after vaccination. Two Hodgkin's patients had levels below 200 ng/ml. Since protective antibody levels are not known, periodic re-vaccination may be necessary in high-risk patients.

919 ALTERATIONS IN IMMUNOLOGIC FACTORS IN HUMAN MILK DURING LACTATION. Randall M. Goldblum, Cutberto Garza, Buford L. Nichols, & Armond S. Goldman. The University of Texas Medical Branch; Baylor College of Medicine. The Departments of Pediatrics. Galveston and Houston, Texas.

The effects of the duration of lactation upon the concentrations of lactoferrin, lysozyme, total IgA, secretory IgA (SIgA), SIgA antibodies to E.coli somatic antigens and the numbers and functions of leukocytes in human milk were investigated. Milk samples were obtained from mothers 20-35 years of age during the first six months of lactation. Confounding variables such as collection and storage conditions were controlled; longitudinal and cross-sectional surveys were performed.

The concentrations of phagocytes, lymphocytes, lactoferrin, total IgA and SIgA and the stimulation of lymphocytes by phytohemagglutinin decreased during the first 12 weeks and then remained unchanged for the next 12 weeks. In contrast, it was found in the longitudinal study that specific SIgA antibodies often increased during lactation (rise in reciprocal titer, mean ± SD, 10.6 ± 18.4). Furthermore, the concentrations of lysozyme, after falling to a nadir of 21-29 µg/ml at 2-4 weeks of lactation, rose progressively to 245 µg/ml at 6 months ($p < 0.001$). Similar levels of lysozyme were also found in human milk collected at 9 months and 1 year of lactation. Although the in vivo significance of these immunologic factors has not been ascertained, the alterations in the concentrations of these factors during lactation may be specific adaptations that protect the developing infant.