● 932 MODULATION BY T CELL SUBSETS OF MYELOID STEM CELLS

Joseph Kaplan, Susumu Inoue, and Mark J. Ottenbreit
Wayne State University School of Medicine, Department of Pediatrics, Children's Hospital of Michigan, Detroit.

It has been shown that T lymphocytes modulate in vitro myeloid colony formation (CFU-C). The current studies were aimed at determining whether human T cell subsets separated on the basis of presence or absence of Fc receptors for IgG have differential effects on CFU-C. T cells prepared by nylon wool filtration of Ficoll-Hypaque separated peripheral blood leukocytes (PBL) were incubated with IgG coated ox erythrocytes (EA_G). Cells rosetting with EA_G (T_G+) were separated from non-rosetting cells (T_G-) by gradient separation. T_G- cells were further separated by sheep erythrocytes (E)- rosette sedimentation into E-RFC+ and E-RFC- cells. The latter, enriched in CFU-C, were pre-incubated alone (control), or in the presence of T_G+ or T_G- cell fraction for 18 hours, and then plated in methylcellulose in the presence of fibroblast conditioned medium as a source of colony stimulating factors. In four experiments, those pre-incubated with T_G- cells showed a 388%, 246%, 149%, and 262% increase over the controls in the number of myeloid colonies formed ($p<0.001$). By contrast, those pre-incubated with T_G+ cells showed an 81%, 94%, 15%, and 91% reduction of the control colony number ($p<0.01$). These findings suggest that T cell subsets have opposing effects on myeloid colony forming cells. Those lacking Fc receptors for IgG stimulate CFU-C, whereas those expressing Fc receptors for IgG inhibit CFU-C.

933 EFFECTS OF PRENATAL ADMINISTRATION OF CORTICOSTEROIDS ON THE DEVELOPMENT AND MATURATION OF PULMONARY ALVEOLAR MACROPHAGE (PAM) IN THE FETAL AND NEONATAL RABBITS.

Aditya Kaul, Moti L. Tiku, Douglas P. Rhone, Dharmapuri Vidyasagar and George F. Smith, University of Illinois and Illinois Masonic Medical Center, Departments of Pediatrics and Pathology, Chicago.

Prenatal administration of glucocorticoids enhances pulmonary maturation in the premature lung by increasing surfactant production. Steroids also exert profound anti-inflammatory and immunosuppressive effects. Lung washings were obtained from neonatal rabbits of different ages, born to mothers given 1-2 mg dexamethasone 2-3 days before delivery and from untreated controls. Cellular elements obtained were counted and cell viability assessed by trypan blue exclusion. Majority of cells were esterase stain positive. The yield of cells in both groups was similar and showed age related increase from $47\pm25 \times 10^6$ cells in 1st week of life to $102\pm15 \times 10^6$ cells in 4th week. Monolayers of adherent PAM were overlayed with rabbit IgG anti-sheep RBC complex; resultant rosettes formed were counted. Percentage of Fc-receptor bearing PAM also increased in both groups with increasing age. However, percentage of Fc-receptor positive cells was significantly lower in steroid treated group i.e., 48 ± 1% in 1st week to 59 ± 11% in 2nd week of life vs 65% in 1st week to 79 ± 4% in 2nd week of life, in control animals.These observations suggest that although prenatally administered corticosteroids produce no significant change in numbers of PAM in neonatal rabbits, these cells, however are immature as demonstrated by decreased Fc-receptor activity. Steroid induced functional impairment of PAM may further imperil the neonate who is already susceptible to infections.

934 INTERACTION OF POLYMORPHONUCLEAR LEUKOCYTES (PMN) AND RESPIRATORY SYNCYTIAL VIRUS (RSV): POSSIBLE ROLE IN PATHOGENESIS OF BRONCHIOLITIS.

Tej N. Kaul, Howard S. Faden, Pearay L. Ogra, Dept. Peds., SUNY at Buffalo, and Children's Hospital, Buffalo, N.Y.

The effect of live RSV, RSV antigen-antibody complexes, and antibody to RSV on oxidative functions of human PMN was determined by employing luminol-dependent-chemiluminescence (LDCL). The presence of immune complexes was established by Raji cell radioimmune assay (RIA) and by the presence of immune aggregates on electron microscopy. The fresh PMN were obtained from healthy adult volunteers. RSV or antibody to RSV alone failed to induce significant degree of LDCL. However, RSV and RSV antibody mixtures generated significant degree of LDCL ($P<0.001$). The degree of LDCL activity induced by the virus-antibody mixtures was directly proportional to the presence and concentration of RSV-specific immune complexes as detected by RIA and EM. Removal of immune complexes by ultracentrifugation effectively eliminated the LDCL responses. LDCL activity was reduced four-fold after complement depletion. These data suggest a marked activation of oxidative metabolic pathway of PMN by RSV specific immune complexes. It is proposed that PMN mobilized to respiratory epithelium during the course of RSV infection, rather than the respiratory epithelium itself may serve as the targets for immune complex deposition. Such interaction may mediate the pathogenesis of RSV infection and bronchospasm via the possible release of metabolic products such as prostaglandins or thromboxanes from activated PMN.

935 NORMAL LYMPHOCYTE-DERIVED CHEMOTACTIC FACTOR PRODUCTION BY NEONATAL LYMPHOCYTES.

Margaret A. Keller, Rose M. Kidd, Rosemary D. Leake, Susan L. Everett. UCLA School of Medicine, Harbor-UCLA Medical Center, Department of Pediatrics, Torrance, California.

This study measured production of the lymphokine, lymphocyte-derived chemotactic factor by neonatal peripheral blood lymphocytes. Previous lymphokine studies of cord lymphocytes have yielded conflicting results with normal or deficient function found. Comparing cord and neonatal lymphocytes, some investigators have reported that neonatal lymphocytes are more deficient than cord lymphocytes in lymphokine production. Since one prior study reports normal LDCF production by cord lymphocytes, we studied LDCF production by peripheral blood lymphocytes from 7 healthy newborns 2 to 5 days of age. Seven healthy adult donors were also studied. Lymphocytes were incubated for 48 hours with or without phytohemagglutinin (PHA). Supernatants from these cell cultures were assayed for monocyte chemotactic activity in chemotaxis chambers using adult monocytes. Results were expressed as the difference in chemotactic activity between stimulated and nonstimulated culture supernatants. Each supernatant from a neonatal culture was assayed with the supernatant from a paired adult control culture. Six of the 7 neonatal lymphocyte cultures produced LDCF, and 5 of the 7 adult lymphocyte cultures produced LDCF. Neonatal lymphocytes were not deficient in LDCF production compared to adult lymphocytes. These results show that neonatal lymphocytes are functionally competent producers of LDCF in response to the mitogen PHA.

● 936 GUT INDUCED ANAPHYLAXIS AND UPTAKE OF A BYSTANDER PROTEIN: AN AMPLIFICATION OF ANAPHYLACTIC SENSITIVITY

R.E.Kleinman, K.J. Bloch and W.A. Walker, Harvard Medical School, Mass. Gen. Hosp., Department of Pediatrics and Medicine, Boston, Massachusetts

This study sought to test the effect of intestinal anaphylaxis on uptake of an unrelated antigen. Adult rats were immunized with 100 ug egg albumin (EA) and alum. Fourteen days later, intestinal anaphylaxis was induced by intraduodenal or intragastric challenge with EA. To test for the changes in vascular and mucosal permeability with anaphylaxis, rats were given ^{125}I-RSA intravenously on challenge and the radioactivity retained in the wall of the gut segments and the trichloracetic acid (TCA)-precipitable radioactivity present in secretions from these segments was determined. Enhanced retention of ^{125}I-RSA was found in the wall of the gut segments and increased amounts of TCA-precipitable radioactivity was found in secretions from antigen-challenge compared to control rats. In other EA immunized rats, bovine serum albumin (BSA) was administered by gavage one hour before challenge with EA. Increased amounts of immunoreactive BSA was detected by radioimmunoassay in serum of rats subjected to local intestinal anaphylaxis. Among the consequences of enhanced systemic uptake of protein present during intestinal anaphylaxis is the induction of an IgE antibody response to this protein. Preliminary experiments suggest that an IgE antibody response can be induced by this mechanism. These findings suggest the broadening of anaphylactic sensitivity of animals to new antigens and may explain multiple sensitivities to food antigens in humans.

937 HUMAN NEONATAL POLYMORPHONUCLEAR LEUKOCYTE (PMNL) ANTIBODY-DEPENDENT CELLULAR-CYTOTOXICITY (ADCC) TO HERPES SIMPLEX VIRUS (HSV) INFECTED CELLS.

Steve Kohl, Johnnie J. Frazier, Larry K. Pickering and Lian S. Loo, University of Texas Medical School, Dept. Ped. & Prog. Infect. Dis., Houston, Tx

ADCC is an important antiviral immune mechanism. Human neonatal cells have lymphocyte ADCC and functional PMNL defects. We therefore analyzed the ability of dextran sedimented, ficoll hypaque centrifuged purified cord blood PMNL from full term healthy infants to kill HSV infected target cells in an 18 hr ^{51}Cr release assay. At an effector to target cell ratio (E:T) of 100:1, ADCC activity of PMNL from 10 cord blood samples (45.1 ± 6.2) was no different than that of PMNL from healthy adults (46.8 ± 9.6). E:T analysis from 100:1 to 30:1 revealed identical values for all 8 sets of neonatal and adult PMNL tested. Antibody concentration requirements were similar for all 3 sets of neonatal and adult cells tested with activity at immune sera concentrations of 1/20 but none at 1/1000. There was no difference in ADCC activity of PMNL from neonates born by vaginal (44.1 ± 11.3) or Caesarian section (45.8 ± 7.8) deliveries.

These data demonstrate the normal function of cord blood PMNL in ADCC and highlight the importance of antibody against HSV in neonatal HSV infection.

Supported by NIH grants 1 PO1 HD 13021, and AI 14450