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SEVERE ADENOVIRUS 7 PNEUMONIA IN A COMPROMISED HOST: IMMUNOLOGICAL INTERVENTION & SUCCESSFUL OUTCOME. Lois A. Nelson, Marilyn A. Menegus, Robert H. Schwartz, Univ. of Rochester School of Med., Dept. of Ped., Rochester, N.Y.

Adenovirus pneumonia in immunologically compromised hosts is usually fatal. A 6 y.o. girl with partial combined immunodeficiency (CID) presented with failure to thrive,high fever,cyanosis & extensive bilateral pneumonia unresponsive to antibiotics. She was neutropenic,lymphopenic & hypogammaglobulinemic(IgG=110mg%) She developed abnormal LFT's & thrombocytopenia.Open lung biopsy was performed.Adenovirus 7 was isolated in 2 days.Histopathology revealed a severe interstitial necrotizing pneumonia with typical Adenovirus inclusions.Two units of fresh frozen plasma(FFP) failed to alter her course.She was given gammaglobulin(GG)(1.8cc per kg)IM.Within 48 hrs. she improved dramatically.By virus neutralization tests the GG contained a high titer (1:240) of Adenovirus 7 antibody(AB). No AB could be detected in either unit of FFP. Recovery coincided with a substantial rise in serum AB titer to Adenovirus 7. Her clinical condition has remained stable over 9 mos. She has received GG(0.7cc/kg) every 3 wks. Evidence of CID persists with poor lymphocyte responses to PHA, Con A, PWM,and in MLC, & no response to Adenovirus 7.Total T-cell E-rosettes have risen from 44% to 75%.

That the administration of specific AB resulted in a successful outcome is strengthened by comparison with an almost identical situation in Arabian foals with CID. That the mechanism of recovery was due to AB neutralization or AB-dependent cell-mediated cytotoxicity (ADCC) remains to be determined.

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MUSCLE ELECTROLYTE METABOLISM IN MONKEYS WITH EXPERIMENTAL SALMONELLA SEPSIS. B.L. Nichols, G.L. Bilbrey, S.L. Kimzey, C.T. Liu and W.R. Beisel. Baylor College of Medicine, U.S. Army Medical Research Institute of Infectious Disease & L. B. Johnson Space Center, Houston, TX 77030.

Altered electrolyte metabolism is reflected in changes in serum concentration and total balance in patients with infectious diseases. A sub-lethal experimental sepsis was induced with 10^8 S. typhimurium organism administered intravenously to determine what role muscle plays in these changes. Muscle samples were obtained by needle biopsy. During the 3 day febrile phase, K wasting was evident in muscle, serum, and in urine. This returned to normal after the lysis of fever. The metabolism of Na and water was independent from that of K. During the febrile period, muscle H_2O increased, and muscle and serum Na increased. Although antidiuresis persisted throughout the first 6 days of illness, an Na diuresis occurred during the period of fever. With the lysis of fever, renal Na retention occurred, muscle Na and H_2O increased to twice the basal levels and serum Na fell 20 mEq/L. It can be concluded that muscle uptake of Na and H_2O plays a significant role in the modulation of serum concentrations and the renal filtered load in experimental sepsis. K depletion was secondary to renal wasting, K loss was in excess of nitrogen loss from muscle. However, studies with the Electron Microprobe for direct determination of intracellular concentration indicate that intracellular dilutions play a major role in the reduction of cellular K during infection.

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PENICILLIN-RESISTANT STREPTOCOCCUS PNEUMONIAE (S.p.) IN IMMUNODEFICIENCY. Henry F. Pabst, and Jana Nigrin. Departments of Pediatrics and Microbiology, University of Alberta, Edmonton, Alberta, Canada.

We have observed the emergence of a penicillin-resistant strain of S.p. in immunodeficient identical twin brothers, A and B (J. Ped. 89: 425, 1976). S.p. was cultured 20 times in 2 years in both boys. These isolates were associated with otitis or pneumonia twice in A, 7 times in B, and without symptoms 8 times in A, 3 times in B. Yeast and streptococcus A were identified rarely. Neither boy was given gammaglobulin. Oral penicillin (100,000 U/kg/d) controlled each infection within 24-48 hours. In July, 1977, a right middle lobe pneumonia developed in A (5 years old) which progressed in spite of increasing p.o. doses of penicillin (250,000 U/kg/d) to abscess formation. S.p. was isolated from sputum and blood, sensitive (disc method) to erythromycin, cephalosporin, tetracycline, chloramphenicol, resistant to penicillin and ampicillin. By tube dilution (MIC) assay, the isolate was sensitive to 1.9 μ/ml penicillin and was identified as strain 14. The same strain with the same MIC was isolated from the nose of B (asymptomatic). A was treated with i.v. penicillin for 3 weeks (150,000 U/kg/d) and i.m. gammaglobulin for 5 days (50 mg/kg/d). Pneumonia and abscess cleared, but respiratory tract cultures have been positive for S.p. intermittently. A 7-year old sister has been negative. We believe that certain immunodeficiencies facilitate the emergence of penicillin-resistant S.p. and that such patients and their contacts must be carefully monitored for this possibility.

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CAN NEONATAL SEPSIS BE DIAGNOSED EARLY? Alistair G. S. Philip and Jean Hewitt. (Spon. by Jerold F. Lucey) Univ. of Vermont College of Medicine, Dept. of Pediatrics, Burlington, Vermont

Currently, many babies receive antibiotics unnecessarily for "phantom" infections. One-third of babies (258/800) admitted to our intensive care nursery in approximately 2 years had bacterial cultures of blood, urine and CSF, and received antibiotics.

Several tests which can be rapidly and easily performed were combined to predict neonatal infection. These included WBC and diff., "mini"-sed. rate, latex C-reactive protein, haptoglobin and IgM. The scoring system previously described (Pediatr. Res. 11:504, 1977) was used. Of 20 cases of proven infection, 17 (85%) had elevated scores (the other 3 babies died very rapidly). In 32 babies with possible or probable infection (antibiotics given for 5 or more days without positive blood culture), 23 (72%) had an elevated score. In 206 babies without infection (antibiotics for 3 or less days), only 8 (4%) had an elevated score.

Individual tests were predictive in 33% or less of proven cases of infection. Substituting buffy-coat smears for latex-IgM could improve the predictive value of this scoring system.

These easily performed tests require no special laboratory facilities and provide an accurate diagnostic indication of neonatal sepsis within 1 hour. This could save physician's time and decrease antibiotic use, length of hospital stay and nosocomial infection.

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DETECTION OF NEONATAL BACTEREMIA, M. Pichichero and J. Todd (Intr. L. Joseph Butterfield). Departments of Perinatology and Pathology, The Children's Hospital of Denver and the Department of Pediatrics, University of Colorado Medical Center, Denver, Colorado.

Case records of all newborns with positive blood cultures were reviewed for 51 consecutive months to determine the clinical significance of a negative culture at 48 hrs. incubation. All cultures were monitored by the early subculture technique. Patients were considered to have clinically documented bacteremia if: (A) one blood culture was positive plus the same organism grew from a second blood culture (80 pts.), or from CSF, abscess, surgical, or urine cultures (14 pts.); (B) one positive blood culture grew a usual pathogen and the patient responded to antibiotic therapy appropriate for that organism (17 pts.). Records were available for 204 cultures on 158 neonates. Organisms growing from 111 (55%) represented significant bacteremia. The remaining 93 (45%) were considered contaminants (only one culture positive, and symptoms resolving without appropriate antibiotic therapy).

	Bacteremia		Contaminant	
Incubation Period	No Atb.	Pre Rx.	No Atb.	Pre Rx.
0-24 hrs.	75 (74%)	0	15 (17%)	0
25-48 hrs.	22 (22%)	2	40 (46%)	3
> 48 hrs.	5 (4%)	7	32 (37%)	3

96% of all clinically significant blood cultures from newborns not pretreated with antibiotics were positive by 48 hrs. To reduce the risks of antibiotic use in the nursery, serious consideration should be given to discontinuing therapy in newborns with negative blood (and other) cultures at 48 hrs.

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DEFECTIVE POLYMORPHONUCLEAR LEUKOCYTE C3b RECEPTOR FUNCTION IN A PATIENT WITH RECURRENT INFECTION. Jane Pitt, (Spon. by M. Katz) Columbia Univ. Col. Phys. & Surgs., Dept. Pediatrics, New York.

Patients with defective phagocytic function associated with recurrent infection generally have defective intracellular killing or cell motility. A three-year old boy presented with a life long history of infections: pneumonias, perirectal abscess, otitis media and pyodermas. The patient had normal cell motility, chemotaxis, complement, NBT reduction, immunoglobulins and lymphocyte and monocyte number, markers and function. The patient's PMNs with 10% autologous serum killed S. aureus > 2SD less than normal and allowed outgrowth of streptococci under conditions in which normals killed >99% (assayed 8 times in 12 months). The defect was not corrected by control sera and the patient's serum did not depress control cell activity. Phagocytosis of 1.1μ latex particles equalled controls but phagocytosis of S. aureus and streptococci was > 4SD below normal. Phagocytosis of zymosan and of bacteria in 10% Mg++EGTA treated serum was > 4SD below controls. PMN C3b receptor activity (Scribner, J Imm, vol. 116, p. 892) was 4±2% (±1SD) with normal levels 66±8%. IgGSRBC receptor activity equalled controls. The defective PMN function in this patient can be attributed to defective C3b receptor activity. Preincubation with 20% FCS, normal human serum or dibutyryl cAMP does not restore activity. Fluorescent antibody studies revealed no increase of detectable cell-associated IgM, IgA, IgG and C3. Fluorescent Con A distributed evenly on the surface of these cells and capped following colchicine treatment.