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USE OF A MICROCOMPUTER IN A DIAGNOSTIC VIROLOGY LABORATORY Robert P. Drucker, Catherine M. Wilfert Duke Univ Med Ctr, Dept. of Pediatrics, Durham

A series of computer programs was developed using an existing data base management system (KnowledgeMan) on a microcomputer to assist with the management of a diagnostic virology lab. The primary purpose was to handle the daily routine: recording specimens and patient data, generating worksheets for the reading and processing of cultures, retrieving culture results or current status, and printing final report forms. It can also handle other lab procedures: Chlamydia cultures, Clostridium difficile toxin assays, and some serologic testing. In addition, the computer facilitates surveillance studies. It can rapidly generate a list of cultures or results for user-defined conditions: ages, hospital location, dates, or a variety of other parameters. A statistics package is included for simple analyses. Security of patient data is always a concern with computer use because of the ease of transporting large volumes of information on floppy disks. Security is provided by KnowledgeMan. All information is stored in scrambled form within files, and cannot be read if accessed from outside KnowledgeMan. On entering the system, each user is assigned a priority status. Each data type, e.g. name, age, result, is assigned up to 16 different access codes to restrict the user to certain pieces of information. The series of programs is menu-driven, and requires no computer knowledge by lab personnel. A computer can decrease significantly the paperwork done by hand, file large amounts of information in a small space, facilitate epidemiologic surveys, and provide a rapid review and analysis of the work performed by the laboratory.

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CLINICAL CORRELATIONS OF CSF ENDOTOXIN-LIKE ACTIVITY IN GRAM-NEGATIVE MENINGITIS. Terry L. Dwelle, Lisa M. Dunkle and Laura L. Blair (spon. by Thomas Aceto). St. Louis University School of Medicine, Cardinal Glennon Children's Hospital, Department of Pediatrics/Adolescent Medicine, St. Louis, MO.

Detection of endotoxin-like activity (ELA) in cerebrospinal fluid (CSF) by limulus amoebocyte lysate (LAL) gelation has been suggested to be a useful technique for diagnosis of gram-negative meningitis. We prospectively screened 1503 CSF specimens with a microassay utilizing 20 µl of CSF added to 20 µl of limulus reagent on an endotoxin-free slide. Specimens and controls were observed for gel formation after 60 minutes incubation at 37°C in a moisture chamber. Serial dilutions of CSF were used to quantitate ELA. The limit of sensitivity of the assay was 0.01 ng/ml. All ELA positive (+) specimens were subjected to confirmatory retesting, after which 49 (3.3%) were ELA (+). Comparison with the 38 available culture results revealed that 33 specimens (87%) were culture (+), that 3 of the 5 culture negative (-) specimens were from patients on therapy for gram-negative meningitis and a fourth was from a neonate. Overall specificity of the test was 99.6% with a (+) predictive value of 86.8%. There was one false (-) specimen giving an overall sensitivity of 97.4% but a (-) predictive value of 99.9%. ELA values > 150 ng/ml correlated with the occurrence of seizures (p<0.05), levels > 3000 ng/ml with peripheral leukopenia and hypoglycorrhachia (p<0.02), and levels > 5x10⁴ ng/ml with death (p<0.005). We conclude that LAL micromethod gelation test is a sensitive, specific, simple screening test for gram-negative meningitis that exhibits prognostic value.

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A SOLUTION TO THE PERTUSSIS PROBLEM? Kathryn M. Edwards, Eileen M. Lawrence, Peter F. Wright, Vanderbilt University Hospital, Department of Pediatrics, Nashville.

The conventional Bordetella pertussis vaccine consisting of killed whole organisms has been shown to be effective in preventing disease but is associated with significant local and systemic reactions. A new acellular pertussis vaccine containing two protein antigens, filamentous hemagglutinin (F-HA) and leukocytosis promoting factor hemagglutinin (LPF-HA) has been developed. The following study was designed to compare the immunogenicity and reactogenicity of the two vaccines. Thirty seven children, ages 4-6 years previously immunized with conventional DPT vaccine at 2,4,6 and 18 months, were enrolled just prior to administration of a pre-school DPT booster. Children were randomly assigned to receive either conventional pertussis or acellular pertussis vaccine in a double blind fashion. The diphtheria and tetanus components in both preparations were identical. Eighteen children received conventional pertussis while nineteen received acellular pertussis vaccine. Reaction rates were assessed by examinations by a single observer at 24 hours. Acellular pertussis vaccine was significantly less reactogenic (p<.05) for each of the signs and symptoms listed below.

	Temp> 100.4	Pain	Fret-fulness	Abnormal Gait	Indura-tion>4cm	Redness >4cm
conventional	45%	60%	45%	65%	55%	25%
acellular	10%	0%	0%	5%	5%	0%

Sera were obtained before and one month after vaccine administration. Equivalent rises in immunoagglutination titers and antibodies to F-HA and LPF-HA were measured in both groups. If studies in progressively younger children confirm the reduced reactogenicity and the equal immunogenicity of the acellular vaccine, it may be a more appropriate candidate than the current vaccine.

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ANTIGENICALLY DISTINCT ROTAVIRUSES ARE COMMON CAUSES OF DIARRHEA IN HUMANS. Joseph Eiden, Steven Vonderfecht, Robert Yolken. Depts. of Pediatrics and Comparative Medicine, Johns Hopkins University School of Medicine, Baltimore, MD 21205.

Rotaviruses (RV) are major causes of diarrheal disease in humans and other animals. Until recently, it was thought that all RVs shared a common antigen, and a vaccine based on this principle is undergoing field testing in humans. However, rotavirus-like agents (RVLA) which are morphologically indistinguishable from RVs but which do not share any antigenic similarity to standard RVs have recently been isolated from cows, piglets, birds, and humans. The role of these agents in human disease has not been extensively studied.

We recently discovered a RVLA which is capable of infecting infant rats (J. Virol. 52:94-98, 1984). We found that fecal samples from adults and humans with acute gastroenteritis can transmit an identical disease to the infant rats. The infection is characterized by typical pathological changes in the gastrointestinal epithelial cells and by the passage of viral particles with a characteristic pattern of double-stranded, segmented RNA. We have devised enzyme immunoassays for the detection of RVLA antigen and antibody. The application of these assays to human specimens has indicated that RVLA infection is common in young children and that infection with RVLA can be associated with severe gastroenteritis. RVLA may be an important new agent of gastroenteritis in humans and animals.

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CYTOMEGALOVIRUS (CMV) ANTIGENIC HETEROGENEITY MAY CAUSE FALSE NEGATIVE RESULTS IN ANTIBODY ASSAYS. Roger G. Faix, Department of Pediatrics, University of Michigan Medical Center, Ann Arbor. (Spon. by SM Donn).

CMV antibody status may be an important factor in antenatal counselling and screening blood products and transplant donors. Though CMV strains are known to have heterogeneous antigens, most clinical laboratories use only a single antigen for CMV serology. The limitations of a single antigen in CMV serology were investigated.

Cord sera and antepartum maternal sera from 3 congenitally CMV-infected infants were CMV-seronegative (titer < 8) on complement fixation (CF) assay using a commercial glycine-extracted (GE) AD169 antigen. When their own CMV isolates were propagated and made into GE-CF antigen, all became seropositive (cord titers 64, 64, 256; maternal titers 16, 32, 32). When 108 random cord sera were assayed for CF antibody using antigens AD169, Davis, and TC (a locally-derived antigen from one of the above infants), 44 were seropositive and 54 seronegative with all 3 antigens. Of the remaining 10 sera, 4 were positive with TC only, 3 with TC and Davis, 2 with Davis and AD169, and 1 with AD169 only. All 10 were positive when a mixture of all 3 antigens was used. No anticomplementary activity was detectable in any of these sera. A commercial CMV-indirect hemagglutination antibody assay that uses AD169 antigen was positive with only 4 of these 10 sera.

Antigenic heterogeneity among CMV strains may cause up to 7% of sera to be misclassified as seronegative if only a single antigen is used in the CF assay.

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ANTIBODY RESPONSE TO PNEUMOCOCCAL VACCINE IN MALNOURISHED CHILDREN. Senih M. Fikrig, Izzet Berkel and Gerald Schiffman. Departments of Pediatrics and Microbiology, Downstate Medical Center and University of Hacettepe, Ankara, Turkey.

Twelve normal and sixteen malnourished (total calorie) children (6 with <3%, 5 with <10% and 5 with <25% malnourishment) over 2 years of age were vaccinated with pneumococcal vaccine containing 14 types of purified capsular polysaccharides. Pre and 2 to 3 weeks post-vaccination sera were obtained and assayed for antibody production against 12 capsular types by means of radioimmunoassay. Geometric mean antibody titers (GMT's) before immunization were comparable between the control subjects and children with various degrees of malnourishment. Control subjects responded well to all capsular types (with the exception of type 6A and 19F known to be nonimmunogenic in the particular lot). Similarly malnourished children, irrespective of the degree of malnourishment showed a comparable level of antibody response to the same capsular polysaccharide types. Thus total calorie malnutrition - up to 25% - does not impair antibody production to pneumococcal polysaccharides and can be safely and effectively used in the protection of these children.