EPIDEMIOLOGY & PREVENTIVE PEDIATRICS

● 494 PREDICTION OF ACCIDENTS FROM CHILD BEHAVIOR SCORES
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While cross-sectional and retrospective studies have associated accidents with impulsive, aggressive and overactive behaviors, longitudinal studies are needed to demonstrate that later accidents can be predicted from early child behavior.

The behavior of 10,394 British children reported at age five were related to their subsequent accident history from age five to ten, obtained from their parents. Aggressive and overactive behaviors at age five were measured by subscales of the Rutter Child Behavior Questionnaire completed by the parents.

Children who scored in the top 90th percentile on both scales at age five had 2.3 times more hospitalized accidents between ages five and ten than children scoring below the 25th percentile on both scales ($p<0.001$). Children with high scores at five were 4.1 times more likely to experience multiple accidents (3 or more) between ages five and ten than those with lower scores ($p<0.001$). After controlling for several measures of social status and family characteristics associated with behavior and accidents by multiple regression analysis, the combination of aggression and overactivity continued to be significantly associated with hospitalized and multiple accidents ($p<0.001$).

While children with deviant behavior only account for a small number of all accidents, they are identifiable with a brief, objective questionnaire and have demonstrably higher risk of accidents than other children.

† 495 EFFECTS OF SMOKING ON OXY- AND CARBOXYHEMOGLOBIN (O_2Hb%, COHb%) IN THE PREGNANT EWE AND FETUS.
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Smoking during pregnancy leads to lower birthweights in infants, possibly due to displacement of oxygen from maternal and fetal hemoglobin by carbon monoxide. We measured maternal and fetal O_2Hb% and COHb% saturation in 4 pregnant ewes after a single smoke using reference tobacco (T), marijuana (M), or marijuana placebo (P) cigarettes. Femoral artery catheters were implanted into ewes and fetuses at 130 days gestation. At 133-140 days, fetal and maternal O_2Hb% and COHb% saturations were determined before, during, and for 24 hr after a continuous 10 min exposure to T, M, or P delivered to the standing ewe through an open-ended tracheal T-tube. The sequence of exposure to T (n=4), M (n=3), and P (n=3) was randomized with >48 hr recovery between exposures. Data (mean±SD) were analyzed by ANOVA and, if $p<0.05$, a multiple comparison procedure was performed.

After the 10 min. smoke, maternal O_2Hb% dropped from 94 ± 1 to < 92 ± 1 for 2 hr. Maternal COHb% rose from 2.0 ± 0.5 to a peak of 6.3 ± 2 at 15 min, and slowly returned to baseline by 6 hours. Fetal O_2Hb% dropped from 41 ± 11 to 32 ± 11 and remained depressed for 1 hr after the smoke, thus representing an approximate 20% drop in O_2 carrying capacity. Fetal COHb% rose steadily from 4.8 ± 0.5 and did not peak until 3-6 hr after the smoke at 6.1 ± 1.

All three smoke-types caused decreases in maternal and fetal O_2Hb%. T appeared to raise COHb higher than M or P.

We conclude that smoking decreases O_2 content in the fetus and speculate that multiple exposures would prolong this O_2 deficit. The fetus eliminates carbon monoxide much more slowly than the ewe.

496 RECRUDESCENCE OF ACUTE RHEUMATIC FEVER IN DALLAS, TEXAS
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Recent evidence suggests that there has been an increase in Acute Rheumatic Fever (ARF) in the northern portion of the United States. To determine if there has been a similar increase in the south, we reviewed all cases of of ARF at CMC and PMH, Dallas, Texas from 1976 - 1986. During this period there were 57 patients who were from 3.2 to 18.9 years of age (median; 10.0 years) whose diagnosis fulfilled the modified Jones criteria for ARF. Eighty-nine percent of patients had carditis; in 27% carditis was the sole major manifestation. There was one death. Twenty-seven (44%) cases occurred during the past 34 mo and 28% of all initial hospitalizations occurred in April. Forty-seven percent and 53% of patients were from the lower and middle socioeconomic strata, respectively. Sixty-two percent of patients received only episodic medical care. One-third of patients had a history of an antecedent streptococcal infection in the past year but only 9% of patients had received ABX in the three months preceding the onset of disease. The majority of patients had no well-defined illness in the two month period prior to the onset of signs and symptoms of ARF. These data indicate that there has been a three-four fold increase in ARF in our center in the past 2½ years as compared to the previous 5 years.

497 USE OF RAPID ROTAVIRUS (RV) TESTING TO CONTROL NOSOCOMIAL ROTAVIRUS INFECTION (RVI) ON AN INFANT WARD.
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Previous studies have demonstrated that failure to isolate children with RVI is associated with a high rate nosocomial infection. To determine the value of rapid identification of RV and resulting institution of enteric isolation in reducing nosocomial spread, patients admitted during a 5 wk period when RV was prevalent in the community had stool tested by ELISA on admission and 3X/wk. Patients with diarrhea also had stool tested for RV within 24 h of admission or development of symptoms by latex agglutination (LA). Of 110 patients, RVI occurred in 24; 14 (14%) were nosocomial (onset ≥ 72 h after admission). In 5, RVI developed after discharge. Diarrhea occurred in 52 (47%) of hospitalized patients; 19 of 48 tested had RV by LA. Of the 19, 6 were isolated when diarrhea began, 6 when the LA result was known 24 h later, and 7 were discharged before test results were known. When compared with ELISA, LA gave 4 false positives and 1 false negative. Three RV infected patients were asymptomatic and were not tested by LA. Rapid testing resulted in more timely and appropriate isolation of RV infected patients but transmission of RV remained appreciable, suggesting that spread can occur in spite of isolation or in the brief interval prior to RV identification.

† 498 ROLE OF MEDICAL AND NURSING PERSONNEL (P) IN NOSOCOMIAL (nosoc) SPREAD OF ROTAVIRUS (RV) ON AN INFANT WARD.
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To assess the role of ward P in nosoc transmission of RV on an infant ward, during a month with a 14% incidence of nosoc RV infection (RVI), 36 P were studied as follows: twice weekly stool and throat swabs were tested for RV (ELISA); paired pre- and post-study sera were examined for 4X rises in anti-RV by an ELISA technique; P were interviewed weekly for GI symptoms; and handwashings from each P were tested for RV. RV was not detected in the stool or throat of any P. Handwashings yielded RV in 1 of 10 P caring for RVI patients and none of 26 P not caring for RVI patients on the sample day. Serology demonstrated 3 RV infections (2 mildly symptomatic, 1 asymptomatic). All P had preexisting anti-RV; the mean was 2744 (95% CL, 1538-3950). Infection occurred in 3/13 with low titers (≤ 500) as compared with 0 of 23 of those with higher titers ($p = 0.05$). 2 of 9 medical students (MS), 1 of 9 house officers (HO) and 0 of 18 nurses (N) were infected. The mean preexisting titer for the MS (948) was significantly ($p = 0.03$) lower than that for HO (3111) and for N (3458). P exposed to children with RVI appear to become infected infrequently. RVI is most likely to occur when P are first exposed; those repeatedly exposed maintain high serum anti-RV titers. If P serve as intermediaries in nosoc transmission, they presumably do so by transient RV carriage.

† 499 GENETIC ANALYSIS OF HOSPITAL-ACQUIRED ROTAVIRUS INFECTION: IDENTIFICATION OF THE MECHANISMS RESPONSIBLE FOR PROLONGED INFECTION.
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We prospectively evaluated rotavirus (RV) excretion in daily fecal specimens from 16 hospitalized children who were originally hospitalized for reasons other than acute gastroenteritis (GE). Seven of the 16 infants were initially evaluated during the course of noscomially-acquired RV GE. The other 9 children, who were selected because they were judged to be likely to have prolonged hospital stays, were asymptomatic and RV(-) at the time of initial study. All of these 9 children shed RV during the study period (1/84-4/84), but RV excretion was associated with clinically apparent GE in only 2 of these 9 patients. RV were shed for a mean of 23 days (range, 4-59 days) in the 16 hospitalized patients. Sequential analysis of RV shedding indicated that many of the children passed RV(+) specimens interspersed with RV(-) specimens as assayed by EM, immunoassay, and polyacrylamide gel electrophoresis. Genetic analysis of RV from asymptomatic and symptomatic periods indicated that several mechanisms were responsible for prolonged periods of RV excretion: re-infection by different strains of RV, persistent infection with a single RV strain, and simultaneous infection with more than one RV strain. It is also likely that genetic reassortment occurred among RV strains. The excretion of RV in hospitalized patients may not be detected by standard assays performed at a single point in time. These patients may serve as unrecognized reservoirs for transmission of RV infection.