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SURVEY OF NUTRITIONAL STATUS OF CHILDREN ON ADMISSION TO HOSPITAL. H.G. Parsons, T.E. Francoeur, P. Howland, L. Smith and P. Pencharz. (Sponsored by I.B. Pless) Montreal Children's Hospital.

Reports of a high prevalence of undernutrition in adult patients made it desirable to assess children upon admission to hospital. The survey was conducted in May as records indicated that it was a representative month. 170 alternate admissions were enrolled: 90 surgical, 80 medical. Height, weight, mid-arm circumference and triceps skin fold thickness were measured and the results compared with norms from the Ten State Nutrition Survey. Patients were divided into 3 age groups: 44 infants and young children (I.<3 yrs), 73 children (C. 3-12 yrs) and 53 adolescents (A.>12 yrs). Sixteen percent of I. were <5th percentile for height; C. 11% and A. 16%. Comparable proportions were <5th percentile for weight (20:9:23% respectively) and for Wt/Ht ratio (15:9%). Fourteen percent of I. were <5th percentile for mid-arm circumference and skin fold thickness. Results from C. and A. were comparable to the norm. The only abnormalities found in biochemical parameters were: 3 patients with low free erythrocyte proto-porphyrin and 16 with reduced erythrocyte folate. In conclusion the anthropometric measurements were the most useful particularly the mid-arm circumference. I. as expected were the group at most risk, their major problem being protein energy malnutrition.

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PROSPECTIVE STUDIES OF GROUP B STREPTOCOCCAL INFECTION. Mary A. Pass, Barry M. Gray, Santosh Khare, Hugh C. Dillon, Jr. Dept. of Pediatrics, University of Alabama in Birmingham and Cooper Green Hospital, Birmingham, Alabama.

A longitudinal prospective study of group B streptococcal (GBS) infection was begun in July 1977. Neonatal colonization rates, carrier sites, and disease incidence was determined for 1,066 of 1,080 infants (99%) born during a six month period in an urban community hospital within the UAB medical center. Selective media were employed. Multiple site cultures of infants were taken shortly after delivery, prior to bath and cord care. GBS were cultured from 14% of infants. Positive sites in order of frequency were: ear (75%), throat (48%), anus (44%) and umbilicus (28%). Throat and anal cultures done at discharge revealed 15% of 805 infants to be colonized; the anus was more often positive (88%) than the throat (55%). A total of 21% of infants cultured were positive for GBS at some time during their nursery stay. Correlation of colonization between mother at delivery and infants was 87%. Seven infants developed clinical illness, suggesting a rather high disease rate. Infecting serotypes were Ia (2), Ic (1), II (2), and III (2). Four infants died; all were premature, had respiratory distress, and had rather rapidly progressive signs of sepsis with shock. Prior knowledge of maternal carriage of GBS coupled with evidence of early distress in low birth weight infants might enhance early recognition of GBS disease.

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EPIDEMIOLOGY OF PATENT DUCTUS ARTERIOSUS (PDA) IN PREMATURE INFANTS WITH RESPIRATORY DISTRESS SYNDROME (RDS). George J. Peckham, Neil Heskell. (Spon. by Jean A. Cortner), Univ. of Pa. Sch. of Med., Dept. of Peds., and The Children's Hospital of Philadelphia, Phila., PA.

The increased incidence of PDA in premature infants, especially those with RDS, has been well documented. The occurrence of bronchopulmonary dysplasia (BPD) in infants with RDS and PDA has been used by some centers as indication for early medical or surgical closure of the PDA. An epidemiologic analysis of 11 variables in 257 infants with RDS treated in 1974-76 was performed to determine specific differences between 47 infants with a PDA and 210 with no PDA. BPD occurred in 11 (22.4%) infants with a PDA and 7 (3.3%) with no PDA (χ^2=19.59, p=<0.0001). The duration of artificial ventilation and hospitalization was also significantly greater for infants with a PDA. Events that occurred early in the clinical course and before the signs of the PDA developed were chosen for analyses in order to determine if the severity of the RDS was greater in those infant who later developed signs of a PDA. The oxygen requirements at 6 to 36 hours of age showed a significant difference in distribution of FiO2 values toward the higher ranges in the PDA infants. Mechanical ventilation was required in 30/44 (61.2%) of the PDA vs. 60/179 (28.6%) (χ^2=17.3, p=<0.0001) of the no PDA patients requiring respiratory therapy. The decision for the use of mechanical ventilation in all patients was reached at a mean of 2 days whereas the signs of PDA developed at a mean of 8.4 days. These data indicate the possibility of a common developmental defect that produces marked immaturity of the lung and delay in ductal closure.

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THE THRESHOLD OF LEAD TOXICITY IN CHILDREN. Sergio Piomelli, Carol Seaman, Anita Curran, Bernard Davidow, NYU Medical Center and NYC Department of Health.

The elevation of erythrocyte protoporphyrin (EP) is a sensitive indicator of childhood Pb poisoning, reflecting interference of Pb with mitochondrial function. This study was directed to establish the minimum blood Pb level (BPb, µg/dl) at which this metabolic evidence of toxicity becomes apparent in children. Venous blood samples were obtained for screening purposes from 1944 apparently normal N.Y.C. children (aged 2-12, median 4.7). BPb was measured by atomic absorption and EP by fluorometry; 1816 children had BPb < 30, the accepted "normal" limit. Up to BPb 15 there was no correlation with EP; above BPb 15 the EP increased exponentially, with a slope similar to that reported for children with BPb > 30. The threshold BPb for EP elevation was determined, by probit analysis and by two different segmented curve-fitting techniques, to be 15.5 (c.l. 14.7 to 16.7). To exclude that the elevation of EP could be due to greater absorption of Pb by children with Fe deficiency, the Fe status of 164 children was estimated by serum ferritin (SF) and transferrin saturation (TS). There was no significant difference in either SF or TS between children with BPb below or above 15, confirming that the elevation of EP observed in the latter group results from the Pb toxicity. This study indicates detectable metabolic Pb toxicity at a level of BPb which is well below the value presently accepted as "normal." This evidence, and the recent demonstration that in remote human populations BPb is negligible, indicate an unacceptable degree of exposure to Pb of urban children.

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THE MEASUREMENT OF FREE ERYTHROCYTE PORPHYRIN (FEP) AS AN INDEX OF THE BODY LEAD BURDEN. Ernest M. Post, Mark Levin, Brian McCarthy, Thelma R. Schneider and Frank A. Oski. Department of Pediatrics, SUNY, Upstate Medical Center, Syracuse, New York.

The measurement of FEP is now widely used as a means of screening for lead poisoning. Very little data is available to demonstrate its utility as an index of the body lead burden. To assess this relationship 156 patients were studied with FEP, blood lead, hemoglobin, serum iron, and an 8-hour EDTA mobilization test. There was a significant correlation between FEP, blood lead and the urinary excretion of lead following EDTA administration. Only 2% of patients with blood lead values of less than 40 µg/dl excreted more than 0.54 µg of lead/mg of EDTA administered; 32% of those with blood leads of more than 40 µg/dl had abnormal lead excretions. With the use of the FEP it was found that 7% of patients with FEP of less than 60 µg/dl of whole blood had abnormal lead mobilization tests while 23% of those with FEP greater than 60 µg/dl had excessive amounts of lead in their urine following the administration of EDTA. The FEP was less reliable as an index of body lead burden in children more than 5 years of age. Results indicate that patients with an FEP of less than 30 µg/dl were at almost no risk of an increased body lead burden. Patients with an FEP value that is greater than 30 µg/dl may have an excessive body lead burden and should have blood lead levels measured to determine if an EDTA mobilization test is required in the diagnostic evaluation.

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THE INFLUENCE OF IRON ON LEAD MOBILIZATION BY EDTA. Ernest M. Post, Mark Levin and Frank A. Oski. Dept. of Peds., SUNY, Upstate Medical Center, Syr., N.Y.

Urinary excretion of lead following administration of calcium ethylenediaminetetraacetic acid (EDTA) is widely employed as an index of the body lead burden. In our experience, as well as that of others, the relationship of blood lead to that removed in the EDTA mobilization test has been imprecise. In an attempt to identify the variables multiple factors were examined in 117 lead mobilization tests conducted in 110 patients. Variables included: age, hemoglobin, free erythrocyte porphyrin (FEP), serum iron, blood lead, and urinary lead excretion expressed as µg urine lead per mg of EDTA administered (Pb/EDTA). Analysis indicates that mobilization results can be best predicted from the blood lead and serum iron values (r = .79; F = 96.5, p <<.001). The multiple correlation equation is:

$$\text{Pb/EDTA} = \frac{1}{-2.74 + \frac{68.7}{\text{Fe}} + \frac{186.2}{\text{Pb}}}$$

The multiple correlation equation indicates that urinary lead excretion is greater with either greater blood lead or serum iron, or both. Correlations with lead alone (r = 0.67), iron (0.65), or FEP (0.19) were not as great as the combination of lead and iron. The enhancement of lead excretion in the presence of normal, or increased serum iron concentrations suggests that iron and lead share similar binding sites and that iron displaces lead from these sites making it more available for chelation.