Clippings

❑ Impact of being small-for-gestational age on survival and long-term outcome of extremely premature infants born at 23–27 weeks' gestation

This study was done to evaluate factors affecting survival and long-term outcome of extremely premature infants and to determine whether small for gestational age (SGA) status is an additional risk factor. Survival was analyzed in 193 infants born between 23 and 27 weeks of gestational age (GA) and compared between SGA (n=43) and appropriate for gestational age (AGA) infants. Long-term outcome was assessed in 123 infants at six years of chronological age by neurological evaluation and cognitive tests.

The long-term survival rates were 72.1% for SGA and 84.0% for AGA infants. Significant independent factors affecting survival were GA (OR 1.79 for 1one week advance, 95% CI 1.36–2.34) and SGA (OR 0.42, 95% CI 0.18–0.997) in comparison with AGA. There were no significant differences in rates of cerebral palsy or mental retardation, 12.0% and 24.0% in SGA, 14.3% and 17.3% in AGA, respectively. Fifty-two percent of SGA and 70% of AGA infants had intact long-term outcome. The perinatal factor found to affect the intact long-term outcome was RDS with surfactant therapy (OR 0.17, 95% CI 0.07–0.45). (J of Perinat Medi 2007 35-5:447-454)

Comment: It is evident from this study that SGA status as well as short gestation had significant effects on survival. Also, respiratory complications after birth had a larger detrimental effect on long-term outcome than whether the infant was SGA or AGA.

❑ Nutritional iron deficiency

Iron deficiency is one of the leading risk factors for disability and death worldwide, affecting an estimated 2 billion people. Nutritional iron deficiency arises when physiological requirements cannot be met by iron absorption from diet. Dietary iron bioavailability is low in populations consuming monotonous plant-based diets. The high prevalence of iron deficiency in the developing world has substantial health and economic costs, like poor pregnancy outcome, impaired school performance, and decreased productivity. Recent studies have reported how the body regulates iron absorption and metabolism in response to changing iron status by upregulation or downregulation of key intestinal and hepatic proteins. Targeted iron supplementation, iron fortification of foods, or both, can control iron deficiency in populations. Although technical challenges limit the amount of bioavailable iron compounds that can be used in food fortification, studies show that iron fortification can be an effective strategy against nutritional iron deficiency. (The Lancet 2007; 370:511-520)

Comment: This recommendation and finding is indeed relevant for our country where Iron Deficiency Anemia is very common. Before going for this type of intervention, we must find out specific laboratory measures of iron status to assess the need for fortification and to monitor these interventions. Selective plant breeding and genetic engineering are promising new approaches to improve dietary iron nutritional quality.

❑ An event-related potential study of attention and recognition memory in infants with iron-deficiency anemia

To determine whether iron-deficiency anemia in infancy represents a risk factor for deficits in attention and memory development using event-related potentials, this study was done.

Artifact-free event-related potential data were obtained at 9 and/or 12 months from 15 infants with iron-deficiency anemia and 19 who were iron sufficient during a test of the infant's ability to discriminate a highly familiar stimulus, the mother's face, from a stranger's face.

A midlatency negative component associated with attention and a late-occurring positive slow

wave associated with memory updating were identified at both ages in the iron-deficiency anemia and iron-sufficient groups. Consistent with the age-appropriate pattern of development at 9 months, the iron-sufficient group showed a greater attentional response (negative component) to the mother and a greater updating of memory for the stranger (positive slow wave). This pattern of responses was not evident in the iron-deficiency anemia group until 12 months, suggesting a delay in cognitive development. (Pediatrics 2007;120(2):e336-e345)

Comment: These data suggest that iron-deficiency anemia adversely affects the allocation of neurophysiologic resources to attention and recognition memory during the processing of information about familiar and unfamiliar stimuli. This delay in cognitive development may reflect alterations in efficiency of central nervous system functions that seem related to early iron deficiency. One should be vigilant enough to prevent iron deficiency anemia right from infancy.

❑ Procalcitonin and C-Reactive Protein as Diagnostic Markers of Severe Bacterial Infections in Febrile Infants and Children in the Emergency Department

This prospective observational study was conducted in the tertiary care Emergency Department of the Children's Hospital in Padova (Italy) between to assess the value of procalcitonin (PCT) and C-reactive protein (CRP), compared with that of total white-blood cell count (WBC) and absolute neutrophil count (ANC), in predicting severe bacterial infections (SBIs) in febrile children admitted to Emergency Department.

The study was conducted in 408 children aged 7-days to 36-months, admitted with fever without source. PCT, CRP, WBC, and ANC were determined upon admission and compared. Specificity, sensitivity, multilevel likelihood ratios, receiver operating characteristic (ROC) analysis, and multivariate stepwise logistic regression were carried out.

SBI was diagnosed in 94 children (23.1%). PCT, CRP, WBC, and ANC were significantly higher in this group than in non-SBI patients. The area under the ROC (AUC) obtained was 0.82 (95% CI: 0.78-0.86) for PCT, 0.85 (95% CI: 0.81-0.88) for CRP (P = 0.358), 0.71 (95% CI: 0.66-0.75) for WBC, and 0.74 (95% CI: 0.70-0.78) for ANC. Only PCT (OR: 1.32; 95% CI: 1.11-1.57; P < 0.001) and CRP (OR: 1.02; 95% CI: 1.01-1.03; P < 0.001) were retained as significant predictors of SBI in a multiple regression model. For infants with fever <8 hours (n = 45), AUC for PCT and CRP were 0.92 (95% CI: 0.80-0.98) and 0.75 (95% CI: 0.60-0.87), respectively (P = 0.056). (Pediatr Infect Dis J. 2007;26(8):672-677)

Comment: Both PCT and CRP are valuable markers in predicting SBI in children with fever without source and they perform better than WBC and ANC. PCT appears more accurate at the beginning of infections, but overall CRP may be the most convenient marker for its better sensitivity and feasibility. This investigation is available at most of the places in our country, so we can use this marker as diagnostic marker for severe bacterial infections.

❑ Low-Fat Diet Not Good for Kids

Children need fat to fuel growth and should not be put on low-fat diets, researchers from East Carolina Uni. said. Children burn more fat per kilocalorie of energy expended than adults even at a low activity level (P<0.02) as per this study. The findings of this small study support current USA Department of Agriculture guidelines recommending higher dietary fat intake for children than adults (25% to 35% of calories versus 20% to 35%).

The earlier version of the guidelines promoted a diet with less than 30% of calories from fat for children older than two. "This guideline was translated by some in an overzealous, but well-intentioned, manner to provide as little fat as possible in the diet leading to inadequate energy intake and compromised growth," researchers wrote.

With the updated dietary guidelines in mind, the researchers studied fat oxidation of five men and five women ages 27 to 55 and the same number of boys and girls ages six to 10. All were healthy, of normal weight, and had a normal activity level without a rigorous physical training program. A consistent metabolic background was established for three days with a weight maintenance diet provided for participants as "take out." Then, each individual had

metabolic rate measured over nine hours using a hood system or room calorimeter while they watched movies, read, or played games. Measurement was repeated on two separate occasions.

It was found that daily calorie expenditure during testing was as expected given the lack of physical activity: 2,072 kcal for men, 1,496 kcal for boys, 1,329 kcal for women, and 1,194 kcal for girls.

However, energy expenditure normalized to lean body mass was significantly higher for children than adults (50.4 kcal/d/kg for boys, 52.4 for girls, 29.7 for men, and 29.48 for women, $P<0.05$). Likewise, total fat burned was not significantly different in adults than in children, even after correction for urea nitrogen excretion (51.4 g/24 hrs versus 62.7). But, whole body fat oxidation was significantly greater in the children than in the adults, as reflected in lower mean respiratory quotients (0.84 versus 0.87, $P<0.02$). Children also burned more fat for the same energy expenditure (0.047 g/kcal/day versus 0.032, $P<0.02$).

Females at whatever age also burned more fat relative to calorie expenditure than males (0.052 g/kcal for girls and 0.042 for women versus 0.041 for boys and 0.023 for men, $P=0.025$). Various theories are being considered like growth may be the reason kids burn more fat, or prepubescent children may oxidize more fat relative to total energy expenditure than adults for the purpose of supporting normal growth processes such as higher rates of protein synthesis, lipid storage and bone growth, etc.

Researchers dismissed the possibility that their findings could be chalked up to heightened fear or arousal among children during tests. They also noted that children were comfortable in the room calorimeter in a manner similar to the adults. (Nutr J 2007: doi:10.1186/1475-2891-6-19.)

Comment: The generalizability of the findings was limited by the small sample size, and larger studies are needed to verify the results of this study. But, it is clear that consistent with current dietary guidelines, a moderate-fat diet is appropriate for children within the context of a diet that meets their energy and nutrient needs.

To prevent interrupting children's growth, parents should keep kids' fat intake to a moderate level within the recommended range taking into account physical activity. We should also explain to interested patients that a diet that includes moderate fat intake may give children the nutrients they need to support normal growth while staving off obesity.

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