Maternal fever and neural tube defects

Maternal hyperthermia during the first trimester seems to contribute to an increased risk for neural tube defects (NTDs). Animal studies in the 1980s suggested that fever might lead to NTDs; in humans, however, this association was harder to confirm. A case-control study was undertaken to investigate an epidemic of NTDs near the Mexican border in Texas. Mexican-American mothers of infants born with NTDs in 14 Texas counties during 1995–2000 were compared with randomly selected control mothers, matched by hospital and year, who gave birth to live children without NTDs. About 6 weeks postpartum, the investigators interviewed mothers concerning their prenatal experiences with fevers, febrile illnesses, exposure to heat from external sources, and hyperthermia-inducing activities.

The findings revealed a two- to threefold increased risk for NTDs in the offspring of women who reported prenatal illness with fever; exposure to hot tubs, saunas, or electric blankets; exposure to environments of high heat, such as a hot kitchen; and work or exercise in the sun.

Comment ► Women often do not know they are pregnant at the time the neural tube is closing (i.e., 2 weeks after the first missed period). When congenital anomalies such as NTDs occur, it is important for pediatricians to take a careful history of predisposing environmental causes. There seem to be sufficient data now to indicate that maternal hyperthermia conveys an increased risk for NTDs. Maternal temperature over 38.5°C (101.3°F) is of concern in early embryogenesis.

Judith G. Hall, OC, MD
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Exremely preterm infants: poor long-term prognosis ► Understanding long-term cognitive outcomes of extremely preterm infants is critical for educational planning and ethical reasons. Investigators identified 308 children who were born in the U.K. or Ireland at less than 26 weeks’ gestation; 241 were assessed at school age (median age: 6 years, 4 months).

On every cognitive and neurologic measure at the school-age follow-up, these children performed significantly worse than a group of 160 classmates who had been delivered at full term. For example, overall mean cognitive scores were 82 versus 106 (possible range, 39–150); 41% vs. 2%, respectively, had scores >2 standard deviations below a published reference mean. Twenty percent of the preterm group had cerebral palsy (vs. 0% of the full-term group). Outcomes in the preterm group varied by gestational age at birth. For example, 12% of those born at <23 weeks’ gestation, 14% of those born at 24 weeks, and 24% of those born at 25 weeks had no “overall disability,” according to the school-age neurocognitive assessment.

Comment ► Resuscitation of extremely preterm infants is becoming more common because of increasing parental pressure and several other factors noted by the editorialists (greater use of assisted reproductive technology, publicity about “miracle babies,” and advanced maternal age). This growing trend toward resuscitation often conflicts with current American Academy of Pediatrics guidelines, which deem it appropriate not to resuscitate infants born at <23 weeks’ gestation. After spending months in the neonatal intensive care unit, nearly all extremely preterm infants will have moderate or severe neurocognitive disabilities as children. Although the editorialists suggest that these children can show some resilience as they get older, it is more likely that as the intellectual challenges of childhood increase, so will the differences between preterm children and their peers.

Howard Bauchner, MD
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Repeat ultrasound exams don’t impair postnatal growth or development ► Prenatal ultrasound (US) exams can be immensely important in detecting fetal abnormalities. Although the exams are presumably harmless for normally developing babies, the long-term consequences have not been well studied. In an earlier study of 2714 children born without congenital abnormalities, 1352 had undergone a single US and Doppler umbilical artery flow study at 18 weeks’ gestation, and 1362 had undergone multiple studies at 18, 24, 34, and 38 weeks’ gestation. In this study, the investigators compared the same two groups for postnatal growth (weight, height, and head circumference) and age-appropriate development at ages 1, 2, 3, 5, and 8 years.

Although the infants who had undergone multiple US examinations were shorter at birth, all subsequent measures of physical size were similar in both groups after adjustment for sex and prematurity. Measures of childhood development (motor skills, language, behavior, and temperament) did not differ between the two groups, except for early language development at 1 year, when unusually early language milestones were more common in the group with a single US exam. Measures of language development at 2 years and vocabulary at 5 years did not differ between groups.

Comment ► These data reassure us that the common practice of fetal US screening does not pose risks to postnatal growth and development. The study was not intended to assess an effect on birth length; therefore, the differences between the two groups should not be interpreted as indicating a risk. The authors plan to investigate the possibility that US influences handedness.

F. Bruder Stapleton, MD
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Boning up on the effects of DMPA use in teens: a sequel!  
Depot medroxyprogesterone acetate (DMPA), a popular contraceptive agent, has been linked with bone loss in adult women and adolescent girls. These authors sought to replicate previous findings on DMPA and determine the effect on bone mineral density (BMD) of a low-dose oral contraceptive (OC) containing 20 μg ethinyl estradiol/100 μg levonorgestrel. In a longitudinal study, they compared lumbar spine and femoral neck BMD in adolescent girls (age range, 12–18) who self-selected DMPA (53), the OC (165), or no hormonal treatment (152).

During the 12-month study, the teens using DMPA lost BMD in the spine (−1.4%) and the hip (−2.2%), while controls who received no hormones increased BMD at those sites (3.8% and 2.3%, respectively). BMD in the OC group increased slightly, but the percentage change was significantly smaller than in the control group. Limitations of the study include the nonrandomized sample, patients’ self-selection of contraceptive method, and a significant difference in age between the subjects and the younger controls, who would be expected to have a comparatively more rapid BMD increase.

Comment  
Reduced rates of teen pregnancy have been widely applauded, and although abstinence is a positive health choice, contraceptive availability and use have also contributed to fewer pregnancies. These findings heighten concern about the adverse effect of hormonal contraceptives during the teen years, when adolescents are acquiring as much as 40% of their bone mass. While we await improved contraceptive options and data that will help us identify patients at risk for bone loss, teenagers who use DMPA and OCs need careful monitoring and support in undertaking such bone-healthy behavior as calcium consumption and weight-bearing exercise.

Susan Jay, MD  
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