Minor Maternal Trauma Can Be Deadly for Fetus

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KAILUA KONA, HAWAII — Insignificant trauma to the mother may not be insignificant to the fetus, Dr. William G. Barsan said at a conference on obstetrics, gynecology, perinatal medicine, neonatology, and the law.

Severe maternal injury is likely to lead to fetal loss in 40%-50% of cases, but severe maternal injuries are relatively rare. Minor injuries to the mother result from 88% of trauma in pregnancy; 60%-70% of fetal losses resulting from maternal trauma follow relatively minor maternal injuries, said Dr. Barsan, professor and chair of emergency medicine at the University of Michigan, Ann Arbor.

Placental abruption is the cause of fetal death in 50%-70% of losses after maternal trauma. “The one that may occur with relatively minor trauma” and can be hard to detect, he said.

In one study of nine fetal deaths after 25 mph crashes, six of the women sustained only “insignificant injuries,” such as bruising or abrasions, Dr. Barsan noted.

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A separate study of 22 fetal deaths resulting from motor vehicle crashes found that six mothers sustained no injuries at all, and nine had bruised abdomens. Other maternal injuries included three ruptured uteri, two chest injuries, one extremity fracture, and one head injury with shock.

Perform electronic fetal monitoring for 4 hours on any pregnant woman with a viable fetus who sustains a significant impact to the torso from falling, crashing, or other causes, Dr. Barsan advised. In one study, all patients with placental abruption after trauma developed uterine contractions every 2-5 minutes at some point during a 4-hour monitoring period.

Many women will have uterine contractions after trauma, and most will not have placental abruption. At Dr. Barsan’s institution, women with frequent uterine contractions after trauma receive an additional 24 hours of electronic fetal monitoring.

“This seems to be a protocol that works pretty well to identify patients at risk of placental abruption,” he said at the conference sponsored by Boston University. Patients who fell yesterday, or last night, do 4 hours of monitoring, he added. Traumas unrelated to the torso—that is, hammering a finger—do not call for monitoring.

“If there are no adverse outcomes within the first few days after trauma, pregnancy outcomes can be expected to be similar to cases without trauma, he said.

Besides placental abruption, maternal hypovolemic shock kills less than 5% of fetuses after maternal trauma, direct fetal injury causes less than 10% of deaths, and about 10% of fetuses die because the mother died after trauma.

No cause is recognized in more than 10% of fetal deaths after maternal trauma, he said.

The cause of placental abruption in motor vehicle accidents was demonstrated in crash testing using “pregnant” dummy within-a-dummy models and computer modeling.

A frontal impact first throws the uterus forward against the abdominal wall, increasing anterior intrauterine pressure up to 550 mm/Hg. Then the torso gets thrown forward and the body flexes forward, crushing the uterus between the torso and the knees and causing a second increase in intrauterine pressure, which may become as great as 600 mm/Hg.

All this creates a high degree of negative pressure in the back of the uterus that can pull the placenta off the uterine wall, Dr. Barsan explained.

Fetal Loss From Maternal Trauma

U.S. deliveries per year 4 million
Pregnancies complicated by trauma 6%–7%
Fetal loss in pregnancies with trauma 1%–2%
Number of fetuses lost from trauma 600–5,200

Source: Dr. Barsan

Gender May Influence Neuro Outcome in ELBW Infants

SAN DIEGO — Female gender in extremely low-birth-weight infants has a positive influence on the neurodevelopmental outcome at 18–22 months, increasing the Bayley-II Mental Developmental Index scores by 8.10 points, Dr. Regina A. Gargus reported at the annual meeting of the Society for Developmental and Behavioral Pediatrics.

“The persistence of this effect over time will need to be re-assessed in longer-term studies,” said Dr. Gargus, medical director of the Dennis Developmental Center at Arkansas Children’s Hospital, Little Rock.

The finding is important because the influence of gender alone on the outcome of extremely low-birth-weight (ELBW) infants has not been described.

In a study Dr. Gargus conducted during her fellowship at Brown University, Providence, R.I., she and her associates reviewed prospectively collected data from the neonatal intensive care unit (NICU) course and follow-up visits of 71 female and 53 male ELBW infant survivors who were admitted to Women and Infants Hospital of Rhode Island in Providence from January 1, 2000 to December 31, 2001.

The infants had a gestational age of less than 32 weeks and a birth weight of less than 1,000 g, and they participated in developmental assessments at 18–22 months. Infants who were born with chromosomal or major congenital anomalies were excluded from the study.

The investigators analyzed the data for demographic characteristics, Score for Neonatal Acute Physiology-Perinatal Extension II (SNAP-PE II) scores, neonatal course, perinatal morbidity, and 18-month outcome.

Most of the medical characteristics did not differ between the two groups, but the mean number of days on oxygen was significantly greater in the male population (65.9 days vs. 50.6 days). The incidence of chronic lung disease was 1.5 times greater in males compared with females, but other comorbidities were not different between the two groups.

Bivariate analysis revealed that female gender was associated with decreased neurodevelopmental impairment and increased Bayley-II Mental Developmental Index scores.

Multivariate regression analysis, adjusted for gestation, chronic lung disease, SNAP-PE II, and level of maternal education, revealed that Bayley-II MDI scores were associated with female gender. Overall, the MDI scores of females were 8–10 points higher than the scores of their male counterparts.

—Doug Brunk