Minor Maternal Trauma Can Be Deadly for Fetus

BY SHERRY BOSCHERT
San Francisco Bureau

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. "This is 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 motor vehicle crashes in which the mothers were not wearing seat belts, six of the women sustained only "insignificant" injures, such as bruising or abrasions, Dr. Barsan noted.

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.

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DR. BARSAN

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.

Even if the patient says that she fell yesterday, or last night, do 4 hours of monitoring, he added. Traumas unrelated to the torso—such as 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	2,600-5,200

Source: Dr. Barsan

Drops in Use of Valproate Linked To Fewer Australian Birth Defects

BY MICHELE G. SULLIVAN
Mid-Atlantic Bureau

WASHINGTON — Decreased use of valproate to manage epilepsy during pregnancy in Australia has produced a corresponding drop in fetal malformations associated with the drug, Dr. Frank Vajda said at the joint annual meeting of the American Epilepsy Society and the American Clinical Neurophysiology Society.

Dr. Vajda, a neurologist at the Victorian Epilepsy Centre in Victoria, Australia, presented the most recent data from the Australian Pregnancy Registry for Women on Antiepileptic Medication. The registry, established in 1999, has enrolled 810 women—77% of all Australian women who had taken antiepilepsy drugs (AEDs) for any reason. The 64-month data contained outcome information on 715 births.

Of the women in the registry, most who were currently taking AEDs (692) were taking the drugs for epilepsy. Other indications were bipolar disorder (11), pain (4), sleep (1), and unspecified (14). The majority of the women (504) were on AED monotherapy.

Most of the births (640) were of live infants without congenital malformations. There were 44 births with fetal malformations: 27 live births with defects, 9 live births with defects that emerged by 1 year, and 8 induced abortions of malformed fetuses. The malformations included spina bifida, anencephaly, holoprosencephaly, Dandy-Walker syndrome, and a variety of cardiac defects.

There were also 23 spontaneous abortions, one induced abortion for maternal indications, and seven stillbirths; no malformations were noted in these fetuses.

The only significant drug/defect associations occurred in women taking high doses of valproate, either as monotherapy or polytherapy. Women taking more than 1,100 mg/day of valproate as monotherapy had a 13-fold increased risk of fetal malformations, compared with women not taking any AEDs. Women taking similar doses of the drug as polytherapy had a sixfold increased risk of fetal malformations.

The rate of malformation among women taking less than 1,100 mg/day was higher than the 2%-3% that occurs in the general population, but the difference was not statistically significant.

Australian physicians appear to be heeding the data linking valproate to birth defects, Dr. Vajda said. The rate of valproate prescribing and dosages prescribed has decreased over the length of the registry, as have the rates of fetal malformation. In 1999, 26% of women on the registry were on the drug. The rate increased to 33% by 2001 and has since dropped to 21%. The average daily dose has decreased from 1,780 mg in 1999 to 936 mg in 2004.

The rate of malformation associated with valproate monotherapy was 16% before 2004, compared with 7% in 2004; the rate associated with polytherapy was 10% before 2004 and 0% in 2004.

However, he noted, the rates of malformation among women on carbamazepine or lamotrigine monotherapy have increased. For carbamazepine, the pre-2004 rate was 4.8%; it rose to 6.5% in 2004. The rate associated with lamotrigine monotherapy was 4.5% before 2004 and rose to 8.6% in 2004. The average dosages of these drugs increased from 1999-2004 as well.

"These are not regarded as significant as the numbers are," Dr. Vajda said in an interview. "It's possible that the increases in dosing may play a part, but there are no significant data available as yet." ■

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 reassessed 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 morbidities, 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