

Canadian Study Links ART to an Increased Risk of Birth Defects

BY DIANA MAHONEY
New England Bureau

SAN FRANCISCO — Babies conceived via assisted reproductive technology are significantly more likely to have birth defects than those conceived naturally, a large Canadian study has shown.

Despite the observed increase, however, the incidence of birth defects in this population “is still relatively uncommon and should not discourage infertile couples from considering this reproductive option,” said lead investigator Dr. Darine El-Chaar at the annual meeting of the Society for Maternal-Fetal Medicine. Rather, “the risk information should become part of counseling for couples that are infertile in order to clarify the risk picture,” she noted.

In a retrospective study of 2005 birth data obtained from the Ontario Niday perinatal database, Dr. El-Chaar and colleagues observed a 1.58-fold increased risk of birth defects overall in babies conceived with assisted reproductive technology (ART), compared with babies conceived naturally.

Of the 61,208 births identified in the

database for which information about reproductive assistance was available, 1,394 resulted from fertility treatments. For purposes of this study, “we lost some subjects in the ART [group] due to missing variables and other factors, and were left with 870 subjects, including 320 who used ovulation induction medications, 180 who underwent intrauterine insemination, and 370 who underwent in vitro fertilization,” said Dr. El-Chaar of the University of Ottawa.

Babies who were conceived with ART had a 1.58-fold increased risk of birth defects overall, compared with babies who were conceived naturally.

In terms of patient and clinical characteristics, mothers in the ART group tended to be older, were less likely to have had a previous child, and were less likely to smoke than mothers in the non-ART group, said Dr. El-Chaar. Also, the ART mothers had a higher rate of cesarean sections and preterm births, and a higher number of multiple births—a factor that likely contributed to the higher preterm birth rate.

After adjustment for these factors using logistic regression, the statistical model showed an overall incidence of birth defects in the ART population of 2.62%, compared with 1.87% in the non-ART population, reported Dr. El-Chaar, noting

that increased values fall within the 2%-3% rate of birth defects seen in the general population.

When analyzed by type of ART intervention, babies conceived via in vitro fertilization had the greatest increased risk of birth defects, at 2.97%, compared with 2.66% for intrauterine insemination and 2.19% for ovulation induction—a finding that suggests an association with the degree to which the various techniques manipulate egg and sperm, Dr. El-Chaar said.

“The highest increase in the ART group was seen in gastrointestinal birth defects, with an adjusted odds ratio of 8.86, followed by cardiovascular defects with an odds ratio of 2.27 and musculoskeletal defects with an odds ratio of 1.51,” said Dr. El-Chaar. There were no significant increases in the risks of neural tube or facial defects between the groups.

Some factors that may contribute to the increased risk of birth defects in the study population are the relatively advanced age of infertile couples, the medications used to stimulate ovulation or to maintain the luteal phase, and factors associated with the procedures themselves, such as the freezing and thawing of embryos or delayed oocyte fertilization, said Dr. El-Chaar. “Further studies are needed to clarify the contributions of these factors, infertility itself, and ART to the development of birth defects.” ■

Universal Prenatal Lead Screen Lauded

BY MICHELE G. SULLIVAN
Mid-Atlantic Bureau

PHILADELPHIA — Universal prenatal screening of maternal blood lead levels significantly increases the identification rate of women with abnormal levels, allowing earlier identification of infants born at risk, Dr. Tatyana Gabinsky said at the annual meeting of the Eastern Society for Pediatric Research.

Dr. Gabinsky of Elmhurst (N.Y.) Hospital Center, presented a 4-year retrospective study (2002-2006) of more than 20,000 women who received blood lead screenings during their first prenatal visits.

Before 2002, her institution followed the Centers for Disease Control and Prevention recommendation for screening only women identified by questionnaire as

Most (91%) of the women with elevated blood lead levels were foreign born. The most common nationalities were Mexican, Bangladeshi, and Pakistani.

being at increased risk for elevated lead levels. Beginning in 2004, the hospital began screening all women as part of routine care.

In all, 20,263 women were screened. The blood lead level was at least 5 mcg/dL in 6%

and 7-10 mcg/dL in 5%.

About 1% of the women had extremely high levels (median 17 mcg/dL; range 11-56 mcg/dL).

With the selective screen, the identification rate of women with levels in the 5- to 10-mcg/dL range was 2.2%, and only 0.28% in those with a level greater than 10 mcg/dL.

With universal screening, those identification rates increased to 7% in women in the 5- to 10-mcg/dL range and 1.6% in women with a level greater than 10 mcg/dL.

Universal screening also allowed staff to increase their identification rate of infants born with elevated blood lead levels (2%-11%), Dr. Gabinsky said.

Most (91%) of the women with elevated blood lead levels were foreign born, she added. The most common nationalities were Mexican (35%), Bangladeshi (21%), and Pakistani (16%).

She is conducting a follow-up study of infants born to mothers with a blood lead level greater than 10 mcg/dL. Infants with a newborn level greater than 10 mcg/dL are retested on a monthly basis, while those with a newborn level of 5- to 10-mcg/dL are tested every 2-3 months. Most of them are able to clear the lead by 1 year of age, she said.

“By the time they are 12 months old, the majority are almost normal. Even in babies with a level as high as 42 mcg/dL, by 12 months they are only at 5 mcg/dL,” said Dr. Gabinsky. ■

Study Links High Beef Consumption in Mothers to Lowered Sperm Counts in Sons

BY JONATHAN GARDNER
London Bureau

High maternal beef consumption in pregnancy was associated with significantly decreased sperm concentration in adult male offspring, investigators reported in Human Reproduction.

The study, which included 387 fertile men born between 1949 and 1983 and living in the United States, found that sons of women who ate at least seven servings of beef weekly had a mean sperm count that was 24% lower than did sons of mothers who ate less.

Investigators raised the possibility that the presence of anabolic steroids and other xenobiotics in beef—may have affected the men’s testicular development in utero, resulting in lowered sperm counts.

They noted that diethylstilbestrol (DES), the first synthetic hormone, was used in cattle from 1954 to 1979 in the United States. After DES was banned, other anabolic hormones continued to be used legally (Human Reprod. 2007 [Epub DOI:10.1093/humrep/dem068]).

Of the offspring of high beef consumers, almost 18% met the World Health Organization threshold of subfertility (20 million sperm/mL of seminal

fluid), compared with 5.7% of the sons of mothers who ate seven or fewer servings of beef per week. This was a statistically significant difference, Shanna Swan, Ph.D., director of the Center for Reproductive Epidemiology at the University of Rochester and her associates wrote.

Between 1999 and 2005, the researchers recruited 773 men born 1949-1983 from five U.S. cities. The men provided semen samples.

Mothers of 387 of the men provided diet information by completing a questionnaire. A total of 26% reported they ate more than seven servings per week of any type of red meat. Thirteen percent said they consumed more than seven servings of beef weekly.

Sons of women who ate more than seven servings of beef per week had sperm concentrations of 43.1 million/mL, compared with 56.9 million/mL in those sons whose mothers ate less beef. This 24% difference was statistically significant. Mothers’ consumption of other red meat, fish, chicken, and vegetables were unrelated to their sons’ sperm concentrations.

In addition to the higher proportion of men meeting the WHO definition of subfertility, the sons of the high beef consumers also were significantly more

likely to self-report previous subfertility (9.8% vs. 5.7%), after adjustment for age.

The researchers noted that self-reporting of beef consumption is likely to be subject to error. In addition, they noted that the steroids in animal feeds might have affected the men as children or adults, and persistent pesticides and industrial chemicals in meat also might play a role. To clarify the role of steroids, the researchers suggested a study of men born in Europe after 1988, when steroids were banned in beef sold and produced there.

In an editorial accompanying the report, Frederick S. vom Saal, Ph.D., of the University of Missouri, Columbia, noted that although DES was banned in the United States in 1979, “administration of combinations of other hormonally active drugs to beef cattle has continued to be a common practice in the [United States].”

He added that, “if xenobiotics are causally involved, the finding of reduced semen quality should be the ‘tip of the iceberg,’ and other reproductive pathologies should also be observed.”

Dr. Saal urged regulatory bodies to revisit the risks associated with exposure during development to hormonal residues in beef (Human Reprod. 2007 [Epub DOI:10.1093/humrep/dem092]). ■