

Snoring in Pregnancy Linked to Increased Gestational Diabetes

BY BRUCE JANCIN

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SLEEP SOCIETIES

SAN ANTONIO — Women who snore frequently during pregnancy are at elevated risk for gestational diabetes mellitus, according to a case-control study.

Although the risk is particularly high in obese snorers, snoring remained an independent risk factor for developing gestational diabetes mellitus (GDM) even after controlling for body mass index, reported Louise M. O'Brien, Ph.D.

"These findings have important implications for the prevention of an event—gestational diabetes mellitus—and all its associated morbidities. I have to believe there is a role for patient education and screening: asking pregnant women about their sleep and especially about their snoring in order to improve pregnancy outcomes," said Dr. O'Brien of the department of neurology at the University of Michigan, Ann Arbor.

She reported on 1,221 women in their third trimester who completed questionnaires about habitual snoring, which was defined as snoring three or more nights per week. Nearly 31% of the women were habitual snorers in their last trimester. Their mean response to a screening 1-hour oral glucose tolerance test was a blood glucose level of 124 mg/dL, significantly higher than the 117 mg/dL in nonsnorers. Thirty-seven percent of frequent snorers had a response of 130 mg/dL or more, compared with 30% of nonsnorers.

A formal diagnosis of GDM was made in 24% of the habitual snorers and 17% of nonsnorers, a significant difference. Altogether, 37% of study participants were obese in their third trimester. That struck some audience members as a high figure, but Dr. O'Brien said that it reflects the advanced state of the obesity epidemic in Michigan.

Habitual snorers were more likely to be obese. GDM was diagnosed in 34.5% of obese habitual snorers and 13% of nonobese nonsnorers.

In a multivariate regression analysis adjusted for age, race,

gestational age, and parity, obese snorers were at 3.6-fold increased risk of developing GDM, compared with nonobese nonsnorers. Upon controlling further for body mass index, habitual snoring in pregnancy remained independently associated with a significant 1.5-fold increased rate of GDM.

Dr. O'Brien noted that this finding of an increased risk of GDM associated with snoring was independently confirmed in two other recent studies.

Physicians at Northwestern University in Chicago reported in a prospective sleep survey study of 189 healthy nulliparas that 18.5% of them snored at least 3 nights per week. Their mean 1-hour oral glucose tolerance test values were significantly higher than nonsnorers' by a margin of 118 to 108 mg/dL. Their 14.3% incidence



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of GDM was significantly higher than the 3.3% rate in nonsnorers, as well.

The 48% of women who averaged less than 7 hours of sleep per night had a 10.2% incidence of GDM, compared with 1.1% in those who slept at least 7 hours (*Am. J. Obstet. Gynecol.* May 25, 2010; PMID:20510182).

In the other study, investigators at Seattle's Swedish Medical Center interviewed 1,290 women early in pregnancy regarding sleep duration and snoring. The incidence of GDM among study participants was 5.3%.

Women who reported sleeping an average of 4 hours or less per night had a 5.6-fold greater rate of GDMs than those who slept 9 hours. Overweight short sleepers had a 9.8-fold increased risk. Overweight women who snored at least 3 nights per week had a 6.9-fold increased GDM incidence compared with normal-weight nonsnorers (*BMC Womens Health* May 14, 2010; PMID:20470416).

Disclosures: Dr. O'Brien reported having no financial conflicts.

DRUGS, PREGNANCY, AND LACTATION

Seafood Safety

Although this column usually reviews the safety and risks of medications during pregnancy and lactation, the safety of fish consumption during pregnancy is among the issues clinicians are asked about by their patients, and is among the queries we regularly receive at the Motherisk program, because of the continuing controversy surrounding fetal safety.

This issue can be highly stressful for women. Although fish are a healthy source of protein that is low in saturated fat and contains omega-3 fatty acids, which may be important for fetal brain development, fish contain methylmercury, which is known to exert adverse effects on fetal brain development. The amount of methylmercury in fish varies widely depending on the type of fish. The Food and Drug Administration and Environmental Protection Agency recommend that pregnant women not eat swordfish, shark, king mackerel, or tilefish, and that they limit their fish and shellfish intake to no more than 12 ounces a week (two average meals) of a variety of fish and shellfish that are lower in mercury.

The fact that methylmercury is a developmental neurotoxin has been established. What has not been clearly defined is the lowest concentration of maternal mercury that is associated with observable neurodevelopmental effects in the unborn child—a question that has been addressed by many scientists in many countries. In two recent studies, we provided new evidence that support testing maternal hair for mercury levels in some groups of pregnant women and suggests that analyzing a woman's hair mercury content before she becomes pregnant might be useful.

In an attempt to define the lowest observable adverse effect level (LOAEL) of mercury, our group conducted a systematic literature review of 48 studies on the effects of prenatal exposure to mercury on the fetus, which used mercury levels in maternal hair samples to estimate prenatal methylmercury exposure. In the studies, adverse neurodevelopmental abnormalities were found at a range of maternal mercury levels based on results of hair sample analyses. We decided that the precautionary principle should prevail: There were variabilities among the studies, but we concluded that the lowest level—0.3 mcg/g—at which adverse events were documented in at least one or two studies should be the level that should not be exceeded (*Ther. Drug Monit.* 2009;31:670-82).

We concluded that testing hair samples for methylmercury exposure is a powerful method of determining long-term exposure and is more accurate than estimating the amount of fish consumed.

We applied these consensus results to the clinical setting, which involved analyzing hair mercury levels and associating those levels with the amount of fish in the diet in three populations of reproductive-aged women living in Ontario: 23 Japanese women living in Toronto who ate fish every day, 22 pregnant women who ate fish regularly and called Motherisk with concerns, and 20 Canadian

women who had no concerns about excessive consumption of fish. All the Japanese women, two-thirds of the women who called Motherisk, and 15% of the Canadian women who were not pregnant had levels that exceeded 0.3 mcg/g. The median level of mercury in the hair samples of the Japanese women was 1.7 mcg/g, significantly higher than the median level among those women who called Motherisk (0.4 mcg/g) and those in the general population (0.2 mcg/g). The study was published online in the *Journal of Pediatrics* (2010 March 24 [doi:10.1016/j.jpeds.2010.01.020]).

The median number of servings of fish per month was also significantly different among the three groups, with 10 servings a month among the Japanese women, 4 servings a month among the women who called Motherisk, and 3 servings a month among the Canadian women. As in other studies, the hair mercury level correlated with the amount of fish consumed. But the data suggested that in only half of the cases could the variability in hair mercury be accounted for by the amount of mercury estimated in the fish the women consumed: Even among

some of the women whose fish intake fell within the FDA/EPA recommendations for pregnant women, levels exceeded 0.3 mcg/g, which in the previous study, was assigned as the LOAEL.

Therefore, although women who follow the FDA/EPA recommendations are probably under the limit, our data show this is not universally true. The study had some limitations, but the results still indicate that following these guidelines may not be adequate to prevent the risk of exposure to levels exceeding the minimum associated with neurodevelopmental effects, and that checking mercury levels in women could be considered for certain groups of women before they get pregnant.

These findings are the basis of a new initiative at Motherisk, where women who call with concerns about fish intake are counseled about the recommended amount during pregnancy but are also offered the hair test. The test can be used to reassure these women that their levels are below 0.3 mcg/g.

The FDA/EPA recommendations are based on the type of fish and amount eaten per week. The amount of mercury in fish is widely variable, however, so we recommend a hair mercury analysis for those women who eat more than the recommended amount of fish. Mercury hair testing is not widely available yet, but it is performed at most university medical centers.

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