Intake of Nicotine in Breast Milk May Disrupt Infant Sleep

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A mother who smokes and breast-feeds appears to be giving her infant a dose of nicotine that significantly interferes with the baby’s sleep, according to the results of a study.

Infants spent an average of about a third less time sleeping after their mothers smoked just prior to breast-feeding, compared with those whose mothers refrained from smoking, wrote Julie A. Mennella, Ph.D., and her associates at the Monell Chemical Senses Center in Philadelphia.

Nicotine is not listed as a drug that is contraindicated during breast-feeding because the benefits of breast-feeding are considered to be so great, Dr. Mennella and her associates noted.

But the presence of nicotine in breast milk could have many adverse consequences.

Mothers who smoke are known to wear their children earlier than are mothers who do not. It might be that sleep-deprived infants tend to be fussier and, if the sleep deprivation occurs because of smoking, the fussiness may stop when the mother stops breast-feeding. That in turn may reinforce a smoking mother’s decision to continue, they suggested.

Sleep also is known to be important for learning and development, and therefore disruption of sleep caused by smoking could have lasting consequences, they said.

Lastly, adolescents whose mothers smoked during their early life are more likely to smoke, and this may sometimes be because they recognize the tobacco-related flavors from breast milk, and come to appreciate them.

The study was conducted with 15 volunteer mother-infant pairs. The average age of the infants was 4 months.

The mothers were brought into a testing center twice, and told to refrain from smoking for 12 hours before each testing session, with the last breast-feeding done about 2.5 hours before the sesion.

During one testing session, they were allowed to smoke at least one cigarette, in a separate room from the infant, and during one session they were not (Pediatrics 2007;120:497-502).

Nicotine levels in breast milk were measured at baseline and after smoking. The infants’ sleep and awake times were monitored using an ambulatory monitor for 3.5 hours.

During the session when the mothers smoked, the estimated dose of nicotine delivered to the infants was a mean of 149 ng/kg. That compared with a mean dose of 127 ng/kg during the nonsmoking sessions.

During the nonsmoking sessions, the infants slept a mean of 84.5 minutes. That compared with a mean of 53.4 minutes during the smoking sessions. All but two of the infants slept less during the smoking session.

Both active sleep and quiet sleep were reduced with smoking, and the duration of the longest bout of sleep declined from a mean of 40 minutes during the non-smoking session to a mean of 37 minutes during the smoking session.

With greater doses of nicotine, the reduction in active sleep was greater, Dr. Mennella and her associates said.

Mothers often cut back on their smoking during pregnancy. But then they tend to relapse to more smoking once their infants are born, the investigators said. And, this information may give them an added incentive to continue to curb their smoking while breast-feeding.

Nicotine that is stored in breast milk reaches peak levels about 30-60 minutes after the mother’s smoking and then declines fairly rapidly.