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**American Academy of Sleep Medicine**

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**Study shows that Maternal Smoking May Alter the Arousal Process of Infants, Increasing Their Risk for SIDS**

The study is the first to investigate the effects of maternal smoking on infant arousal processes using polysomnography to define the progression of responses.

**Westchester, Ill.** — A study in the April 1 issue of the journal *SLEEP* shows that maternal smoking is associated with an impaired infant arousal process that may increase the risk for sudden infant death syndrome (SIDS). The authors suggest that maternal smoking has replaced stomach sleeping as the greatest modifiable risk factor for SIDS.

Results show that the progression from sub-cortical activation to cortical arousal was depressed in smoke-exposed infants, who had lower proportions of full cortical arousals from sleep and higher proportions of sub-cortical activations than infants born to non-smoking mothers. The study also indicates that there is a dose-dependent relationship between cortical activation proportions and levels of infant urinary cotinine, a nicotine metabolite. Cortical arousals were lowest in babies with higher levels of smoke exposure.

According to senior investigator **Rosemary Horne, PhD, scientific director of the Ritchie Centre for Baby Health Research at Monash Institute of Medical Research in Melbourne, Australia**, decreased cortical arousals from sleep have been observed in victims of SIDS prior to death.

“Our study suggests that maternal smoking can impair the arousal pathways of seemingly normal infants, which may explain their increased risk for SIDS,” said Horne.

According to the authors, SIDS is the third-leading cause of infant mortality in the U.S. Although the exact cause is unknown, research suggests that an impairment of the arousal process from sleep in response to a life-threatening situation is involved. Autopsies of SIDS victims have revealed brainstem abnormalities in key areas that are required for arousal and cardiorespiratory control.

The study involved 12 healthy, full-term infants born to mothers who smoked an average of 15 cigarettes per day. Their arousal responses during daytime sleep were monitored and compared with that of 13 healthy infants who were born to nonsmoking mothers.

Daytime polysomnography was performed on each child on three occasions: at 2 to 4 weeks, 2 to 3 months and 5 to 6 months of age. Arousals were induced without compromising the infants' natural sleep cycles by delivering a pulsatile air-jet for five seconds through a hand-held cannula at the infants' nostrils.

The air pressure was increased incrementally until arousal criteria were met. Sub-cortical arousals were defined by body movements, heart rate increases and respiratory changes. Full cortical arousals involved a sub-cortical arousal that was accompanied by an abrupt change in electroencephalogram frequency.

According to the authors, 15 percent to 25 percent of pregnant women in Western countries smoke throughout pregnancy.

*SLEEP* is the official journal of the Associated Professional Sleep Societies, LLC (APSS), a joint venture of the American Academy of Sleep Medicine and the Sleep Research Society. The APSS publishes original findings in areas pertaining to sleep and circadian rhythms. *SLEEP*, a peer-reviewed scientific and medical journal, publishes 12 regular issues and one issue comprised of the abstracts presented at the SLEEP Meeting of the APSS.

For a copy of the study, "Maternal Smoking Impairs Arousal Patterns in Sleeping Infants," or to arrange an interview with the study's author, please contact Kelly Wagner, AASM public relations coordinator, at (708) 492-0930, ext. 9331, or [kwagner@aasmnet.org](mailto:kwagner@aasmnet.org).

AASM is a professional membership organization dedicated to the advancement of sleep medicine and sleep-related research. As the national accrediting body for sleep disorders centers and laboratories for sleep related breathing disorders, the AASM promotes the highest standards of patient care. The organization serves its members and advances the field of sleep health care by setting the clinical standards for the field of sleep medicine, advocating for recognition, diagnosis and treatment of sleep disorders, educating professionals dedicated to providing optimal sleep health care and fostering the development and application of scientific knowledge.

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