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Maternal oral snuff during gestation alters heart rate variability in infants

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Introduction: Maternal smoking causes significant morbidity and mortality in the human infant. Following prenatal exposure, the newborn displays alterations in autonomic control and has increased risk for sudden infant death syndrome, SIDS.

Objective: This study aimed to establish whether snuff(non smoking tobacco) use by the mother during pregnancy is a less harmful alternative for the baby than smoking cigarettes.

Methods: A prospective observational study was conducted on infants (n=56) of women who used snuff or cigarettes during pregnancy. Maternal nicotine use was determined both with questionnaires and with cotinine levels in urine of the infant. We studied heart rate variability in infants at 1-2 months of age with a 24 hour-ECG followed by spectral analysis of a 2 hour ECG segment during sleep. The outcome LF/HF ratio reflects the balance between the sympathetic and parasympathetic system.

Results: The LF/HF ratio was higher in snuff and smoke as compared to controls and was due to decreased parasympathetic activation. Prenatal nicotine exposure, both snuff and smoking, without any postpartal exposure showed an increased LF/HF ratio compared to controls. We could see no difference of non-smoke tobacco compared to cigarettes which suggests that the detrimental effects are mediated via nicotine. The alteration in autonomic regulation seems to be long lasting and due to neonatal reprogramming.

Conclusion: The results of this study indicates that nicotine is harmful for the developing infant in all forms. It thus emphasizes the importance of abstaining from all forms of nicotine during pregnancy and that there are no safe forms of tobacco or safe periods for its use during gestation.