

Use of nicotine during pregnancy may increase risk of sudden infant death syndrome

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Nicotine exposure during pregnancy, whether from smoking cigarettes, or nicotine patches and e-cigarettes, increases risk of sudden infant death

syndrome—sometimes known as "cot death"—according to new research published in the *Journal of Physiology*.

Sudden infant death syndrome (SIDS) is the sudden and unexpected death of an infant under 12 months of age that occurs typically while sleeping. Failure of autoresuscitation, the ability to recover normal heart rate and breathing following gasping caused by lack of oxygen in the brain, has been recorded in human SIDS cases.

Smoking increases risk for SIDS. Over the last decade, use of cigarettes has declined significantly, however, over 10% of pregnant women still smoke during [pregnancy](#). Over recent years [nicotine](#) replacement therapies, such as nicotine patches or e-cigarettes, have been prescribed to women who wish to quit smoking during their pregnancy. However these nicotine replacement therapies may not protect infants from SIDS. With increasing numbers of nicotine patch and electronic cigarette users during pregnancy, there is an increasing urgency to better understand the impact of [nicotine exposure](#) on the development of babies during pregnancy.

The researchers showed that exposure of the mother to nicotine during pregnancy can affect the baby's central nervous system and impair the baby's cardiorespiratory responses to stressful environments, e.g. asphyxia, especially in babies who have both serotonin and serotonin receptors deficiency in the brain. This can damage a key biological mechanism called autoresuscitation that protects the infant from a severe lack of oxygen. Such failure of autoresuscitation increases the likelihood of SIDS because the infant is unable to recover from environmental stresses that cause lack of oxygen, such as getting tangled in bedding, a minor illness or a breathing obstruction.

This research suggests that the use of nicotine, e.g. [nicotine patches](#) or electronic cigarettes, are not a safe alternative to cigarettes during

pregnancy, because exposure to nicotine by any route may be harmful to a baby's cardiorespiratory function and increase the risk of SIDS.

The research conducted by the Geisel school of Medicine at Dartmouth, Lebanon, New Hampshire, tested whether use of nicotine during pregnancy and nursing is more likely to elicit autoresuscitation defects in developing animals. They exposed rats to nicotine through maternal blood or milk and then looked at their response to repeated periods of severe low oxygen.

Stella Lee, the corresponding author of the study, commented on future research "Sudden infant death syndrome is such a distressing tragedy for families. We still don't fully understand the causes, but this research is important because it helps mothers reduce the risk."

Aihua Li, a senior author on the project added "We will continue to identify the possible predictors of risk and consider how we can treat [infants](#) who have a compromised autoresuscitation mechanism."

More information: Stella Y. Lee et al, Pre- and early postnatal nicotine exposure exacerbates autoresuscitation failure in serotonin-deficient rat neonates, *The Journal of Physiology* (2018). [DOI: 10.1113/JP275885](#)

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