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A Newly Found Relationship between Heat and Sudden Infant Death Syndrome

Aashka Patel

For adults, sleep is a mundane activity, and very few sleep-related concerns exist for adults aside from the fear of not getting enough of it. For children under the age of one, however, sleep sometimes becomes permanent. Sudden Infant Death Syndrome (SIDS) is defined as the sudden death of an infant without an explainable cause, usually occurring during sleep¹. Recently, many studies of this phenomenon have been conducted in the hopes that better preventions might be found.

Currently, there are three major physical risk factors associated with SIDS: brain abnormalities, low birth weight, and respiratory infection². Infants with improper development of brain regions associated with breathing, heart rate, and arousal have a greater risk of SIDS. Premature birth (thus, low birth weight) leads to immature autonomic processing, which impairs the infant's regulation of heart rate and breathing pattern. Furthermore, babies who suffer respiratory illnesses also have greater trouble breathing and a greater chance of SIDS. Various environmental factors also appear to contribute to the prevalence of SIDS. For example, babies sleeping on their sides, on soft surfaces, or with their parents have an increased risk of SIDS because of ineffective breathing, most likely due to restricted airways.

Recent research has identified another important environmental factor in SIDS: heat³. Back to Sleep, a popular campaign that encourages parents to make sure infants sleep on their backs instead of their stomachs to prevent the constriction of airways, could also provide benefits concerning the newly-discovered risk factor of heat. Infants lack the thermoregulatory systems that adults have, and instead can regulate their body temperature through the face. Sleeping on the stomach interferes with this regulation, and thus provides another reason why sleeping on their backs is beneficial for infants.

In Canada, a 30-year study was conducted to observe whether increased environmental temperatures resulted in an increase in SIDS⁴. A total of 196 cases of SIDS were analyzed by comparing the prevalence of SIDS during days of extreme temperatures versus those near average temperature for a given month. The results showed a positive correlation between temperature and SIDS in 3–12 month-old infants specifically. On days when temperatures were greater than 29 °C, there was a 2.78 times greater chance of sudden infant death than on 20 °C days. The connection between SIDS and heat has also been studied using stress gene expression⁵. Cultured fibroblasts and connective tissue cells were taken in autopsies of SIDS-related deaths, and the expression of four stress responsive genes was measured. High temperatures increased expression of all four genes. The genes *HSPAA1B*

and *HSPD1*, which become active during elevated stress responses, had the highest levels of expression compared to the control gene.

A decrease in the prevalence of SIDS from 153 to 51.6 deaths per 100,000 live births has occurred since 1980⁶, which may be largely due to the Back to Sleep campaign's promotion of awareness of SIDS and safer sleeping positions. Of course, no parents should have to worry about their children not waking up. Thankfully, many scientists continue to work towards identifying new causes and preventive measures for SIDS, offering the hope that its incidence will only continue to decrease.

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