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Electromagnetic fields affect infant heart rate

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NEW YORK (Reuters Health) - The electromagnetic fields that are generated by incubators in hospital nurseries influence the heart rate variability in newborns, suggesting that such fields are capable of altering autonomic nervous system activity, new research indicates.

The autonomic nervous system helps the body adapt to changes in the environment by adjusting or regulating stress responses. These functions take place "automatically" or "involuntarily" and include but are not limited to adjustments in blood vessel size, fluctuations in blood pressure, and the generation of electrical activity, such as the electrical signal that makes the heart muscle contract - and keeps the heart beating.

The long-term impact of electromagnetic field exposure is unclear, but it could have implications for preterm infants who often spend several weeks in incubators, note Dr. Carlo V. Bellieni, from Policlinico Le Scote in Siena, Italy, and colleagues.

The researchers report their findings in the Fetal and Neonatal Edition of the Archives of Disease in Childhood.

The study results stem from an evaluation of heart rate variability in 43 newborns, none of whom were premature or critically ill. Twenty-seven of the infants underwent heart rate variability testing for 5-minute intervals while an incubator motor was on, off, and on again. The remaining 16 infants were not exposed to an incubator motor, but were exposed to audio stimuli mimicking the sounds of a motor.

Heart rate variability refers to the normal alterations in heart rate that occur under resting conditions, and in other circumstances, in healthy individuals. Reduced heart rate variability is therefore a sign of some cardiac abnormality.

When the incubator motor was turned off, total power and the high-frequency component of heart rate variability increased, while the low frequency/high frequency ratio decreased. Turning on the motor again restored the balance. The low frequency spectral component of heart rate variability changed significantly, but only when the motor was turned on the second time.

Heart rate variability did not change in the group of infants exposed to changing background.

"International recommendations and laws set levels to safeguard the health of workers exposed to electromagnetic fields: newborns should be worthy of similar protection," the authors conclude. They suggest that preterm infants be periodically evaluated, with particular attention to the development of the autonomic nervous system.

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