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Ketamine-Midazolam Anesthesia Induces Total Inhibition of Cortical Activity in the Brain of Newborn Rats

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Abstract

© 2016, Springer Science+Business Media New York. The effects of general anesthetics ketamine and midazolam, the drugs that cause neuroapoptosis at the early stages of CNS development, on electrical activity of the somatosensory cortex in newborn rats were studied using extracellular recording of local field potentials and action potentials of cortical neurons. Combined administration of ketamine (40 mg/kg) and midazolam (9 mg/kg) induced surgical coma and almost completely suppressed early oscillatory patterns and neuronal firing. These effects persisted over 3 h after injection of the anesthetics. We concluded that general anesthesia induced by combined administration of ketamine and midazolam profoundly suppressed cortical activity in newborn rats, which can trigger neuroapoptosis in the developing brain.

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Keywords

anesthesia, EEG, newborn, somatosensory cortex