

学位論文の要旨

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主論文の題名

Sevoflurane in combination with propofol, not thiopental, induces a more robust neuroapoptosis than sevoflurane alone in the neonatal mouse brain

主論文の要旨

Purpose Sevoflurane is commonly used alone or in combination with thiopental or propofol in children and neonates. We measured the neurotoxicity of these anesthetics at clinical doses, alone and in combination, in the developing mouse brain.

Methods Seven-day-old mice were randomly assigned to 6 treatment groups. Three groups were exposed to 3% sevoflurane for 6 h after injection of saline, thiopental (5 mg/kg), or propofol (10 mg/kg), whereas three groups were exposed to room air for 6 h after injection of equal doses of saline, thiopental, or propofol. Apoptosis in the hippocampal CA1 region (CA1) and retrosplenial cortex (RC) was assessed using caspase-3 immunostaining.

Results Sevoflurane alone caused significantly higher apoptosis in the CA1 compared with saline plus air ($P = 0.04$). Sevoflurane in combination with propofol resulted in significantly greater numbers of apoptotic neurons than sevoflurane alone in both the CA1 and the RC ($P = 0.04$). However, there was no significant difference in apoptotic neuron density in both the regions between the groups treated with sevoflurane alone and in combination with thiopental ($P = 0.683$).

Conclusion There is the possibility that the combination of sevoflurane and propofol is more harmful anesthetic technique than sevoflurane alone in pediatric patients.