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Involvement of kainate receptors in the analgesic but not hypnotic effects induced by inhalation anesthetics

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Abstract:
In the present study, the role of kainate (KA) receptors in hypnosis and analgesia induced by emulsified inhalation anesthetics was investigated. A mouse model of hypnosis and analgesia was established by an intraperitoneal injection of emulsified enflurane, isoflurane or sevoflurane. We intracerebroventricularly (*icv*) or intrathecally (*it*) administered KA, a KA receptor agonist to mice. The effects of the KA on the sleep time were observed using a hypnosis test, and the tail-withdrawal latency was analyzed using the tail-withdrawal test. In the hypnosis test, KA (2.5, 5 or 10 ng; *icv* administered) treatment had no distinctive effects on the sleep time of mice treated with emulsified inhalation anesthetics. In the tail-withdrawal test, KA (0.2, 0.4 or 0.8 ng; *it* administered) treatment significantly and dose-dependently decreased the tail-withdrawal latency of mice treated with emulsified anesthetics. These results suggested that KA receptors may modulate the analgesic but not hypnotic effects induced by emulsified enflurane, isoflurane or sevoflurane.

Key words:
hypnosis, analgesia, inhalation anesthetics, KA receptors