Strychnine-Sensitive Glycine Receptors Mediate the Analgesic but Not the Hypnotic Effects of Emulsified Volatile Anaesthetics

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Key Words

Glycine receptor • Volatile anaesthetics • Propofol

Comment

We read the article by Chen et al. [1] dealing with the role of glycine receptors in volatile-anaesthetic-induced anesthesia with great interest. The authors investigated the effects of intraperitoneally injected doses of volatile anaesthetics separating the antinociceptive and hypnotic effects of these anaesthetics. Strychnine, a selective glycine receptor antagonist, had no influence on the sleeping time in mice but decreased the pain index in the hot plate test, a model of experimentally induced pain. The results lead to the hypothesis that glycine receptors contribute to the analgesic but not the hypnotic effects of volatile anaesthetics.

There is a certain body of evidence that the glycine receptor is crucial not only for the effects of a variety of volatile anaesthetics but also for the effects of alcohols and the intravenous anaesthetic propofol [2, 3]. In line with the results obtained by the authors, we have previously shown that the intravenous anaesthetic propofol did not differ from its non-hypnotic structural analogue di-tert-butylphenol in the potency to activate glycine receptors [4]. This suggests that the activation of glycine receptors may not contribute substantially to the hypnotic effects of propofol in vivo. Furthermore, there is experimental evidence that loss of inhibitory synaptic transmission within the dorsal horn of the spinal cord

plays a key role in modulating ascending nociceptive pathways and pain processing [5, 6]. Inhibitory postsynaptic transmission in the spinal cord involves mainly glycine and, to a lesser extent, GABA [7].

Apparently, positive glycine receptor modulation is not directly linked to the hypnotic effects of different anaesthetics. These findings and the studies of other groups point towards the strychnine-sensitive glycine receptor family as a target site for therapeutic agents aiming at inhibiting pain sensitization but not for inducing hypnosis [1, 4, 6].

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