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E-BABE- Dexmedetomidine Oral Mucosa Patch for Sedation Suppresses Apoptosis in Hippocampus of Normal Rats

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exmedetomidine, an α2-adrenergic agonist, provides sedative and analgesic effects without significant respiratory depression. Dexmedetomidine has been suggested to have an antiapoptotic effect in response to various brain insults. We developed an oral mucosa patch using dexmedetomidine for sedation. The effects of the dexmedetomidine oral mucosa patch on cell proliferation and apoptosis in the hippocampus were evaluated. A hydrogel oral mucosa patch was adhered onto the oral cavity of physiologically normal rats and was attached for 2 hours, 6 hours, 12 hours or 24 hours. Plasma dexmedetomidine concentrations were determined by liquid chromatography-electrospray ionization-tandem mass spectrometry-multiple-ion reaction monitoring (LC-ESI-MS/MS-MRM). Cell proliferation in the hippocampus was detected by Ki-67 immunohistochemistry. Caspase-3 immunohistochemistry, terminal deoxynucleotidyl transferasemediated dUTP nick end labeling staining and Western blotting for Bax and Bcl-2 were performed to detect hippocampal apoptosis. The levels of Brain-Derived Neurotrophic Factor (BDNF) and tyrosine kinase B (TrkB) in the hippocampus were also measured by Western blotting. Plasma dexmedetomidine concentration increased according to the attachment time of the dexmedetomidine oral mucosa patch. Hippocampal cell proliferation did not change due to the dexmedetomidine oral mucosa patch, and the dexmedetomidine oral mucosa patch exerted no significant effect on BDNF or TrkB expression. In contrast, the dexmedetomidine oral mucosa patch exerted an antiapoptotic effect depending on the attachment time of the dexmedetomidine oral mucosa patch. A dexmedetomidine oral mucosa patch can be used as a convenient tool for sedation and is of therapeutic value due to its antiapoptotic effects under normal conditions.

Biography

Deok-Won LEE is currently working as a Professor at Department of Oral & Maxillofacial Surgery Kyung Hee University Dental Hospital at Gangdong (Kyung Hee Neo Medical Center) School of Dentistry, Kyung Hee University.

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