



Donepezile prevents morphine-induced apoptosis in rat cerebral cortex

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Background and Aims: More recently we found that donepezile, a specific NMDA receptor agonist, decreased the development of tolerance to the analgesic effect of morphine. It has been indicated that tolerance to the analgesic effect of morphine is associated with apoptosis in the central nervous system. In this investigation the effect of donepezile on morphine-induced apoptosis in rat cerebral cortex was evaluated.

Methods: An in situ terminal deoxynucleotidyl transferase-mediated dUTP-biotin nick end-labeling (TUNEL) method was used as an apoptosis assay. All animals (n=6) received the same treatment regimen such as the behavioral groups in our previous study.

Results: The results indicated that in the control group (morphine and 0.9% normal saline), the number of TUNEL-positive cells significantly ($P<0.001$) increased in cerebral cortex in comparison with vehicle treated animals. In addition donepezile (0.5, 1 and 1.5 mg/kg/day, ip) for 14 days, attenuated the number of apoptotic cells in the cerebral cortex in comparison with the control group.

Conclusions: In conclusion, we found that administration of donepezile attenuates morphine-induced apoptosis in the cerebral cortex after the development of tolerance to morphine's analgesic effects.

Keywords: Apoptosis; Donepezile; Morphine; Tolerance