Assessing the effect of drug tolerance due to chronic administration of morphine and salicylate on synaptic plasticity

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Abstract

Background & Aim*:* Salicylates and opioids are widely used in chronic pain relief. Chronic use of these drugs reorganizes synaptic function, especially experience-dependent plasticity in brain regions. Therefore, in this study the effects of chronic administration of salicylate and morphine on synaptic plasticity were investigated.

Methods**:** in this review, Elsevier, Science Direct, PubMed and Google Scholar databases were searched for the following keywords: salicylate, morphine, drug tolerance, and synaptic plasticity. At the end, 62 of the obtained reports were included in the study.

Results**:** In addition to induction of tolerance to anti-nociceptive effect and cross-tolerance, chronic salicylate administration as like as morphine has long-lasting effects on hippocampal neuronal networks which are manifested as excitability of neurons and ability of activity and experience-dependent plasticity. Some of these effects can be documented in the hippocampus-related functions such as spatial learning and memory.

Conclusion**:** Considering the effects of salicylate and morphine on the nervous system and synaptic transmission, the effects of these drugs on the processing of input data and as a result on cognitive functioning would not be unlikely, thus necessitating further behavioral and electrophysiological studies.

Keywords**:** Salicylate, Morphine, Drug tolerance, Synaptic plasticity

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