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α -Terpineol attenuates morphine-induced physical dependence and tolerance in mice: role of nitric oxide

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Objective(s): Dependence and tolerance to opioid analgesics are major problems limiting their clinical application. α -Terpineol is a monoterpenoid alcohol with neuroprotective effects which is found in several medicinal plants such as *Myrtus communis*, *Laurus nobilis*, and *Stachys byzantina*. It has been shown that some of these medicinal plants such as *S. byzantina* attenuate dependence and tolerance to morphine. Since α -terpineol is one of the bioactive phytochemical constituent of these medicinal plants, the present study was conducted to investigate the effects of α -terpineol on morphine-induced dependence and tolerance in mice.

Materials and Methods: The mice were rendered dependent or tolerant to morphine by a 3-day administration schedule. The hot-plate test and naloxone-induced withdrawal syndrome were used to evaluate tolerance and dependence on morphine, respectively. To investigate a possible role for nitric oxide (NO) in the protective effect of α -terpineol, the NO synthase inhibitor, L-N(G)-nitroarginine methyl ester (L-NAME) and NO precursor, L-arginine, were used. Results: Administration of α -terpineol (5, 10, and 20 mg/kg, IP) significantly decreased the number of jumps in morphine dependent animals. Moreover, α -terpineol (20 and 40 mg/kg, IP) attenuated tolerance to the analgesic effect of morphine. The inhibitory effects of α -terpineol on morphine-induced dependence and tolerance were enhanced by pretreatment with L-NAME (10 mg/kg, IP). However, L-arginine (300 mg/kg, IP) antagonized the protective effects of α -terpineol on dependence and tolerance to morphine.

Conclusion: These findings indicate that α -terpineol prevents the development of dependence and tolerance to morphine probably through the influence on NO production.

Biography

Alireza Masoudi is affiliated to Department of Pharmacology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran. He is a recipient of many awards and grants for his valuable contributions and discoveries in major area of addiction research. His international experience includes various programs, contributions and participation in different countries for diverse fields of study. His research interests reflect in his wide range of publications in various national and international journals.

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