Abstract

The study was designed to investigate the involvement of noradrenergic and serotonergic receptor systems in the modulation of formalin-induced pain-related behaviour in the Speke's hinged tortoise. Intradermal injection of 100 μL of formalin at a dilution of 12.5% caused pain-related behaviour (hindlimb withdrawal) that lasted for a mean time of 19.28 min (monophasic response). Intrathecal administration of clonidine (α_2-adrenergic receptor agonist) and yohimbine (α_2-adrenergic receptor antagonist) at a dose of 40 μg/kg and 37.5 μg/kg or 50 μg/kg, respectively, caused a highly significant reduction in the duration of the formalin-induced pain-related behaviour. The effect of clonidine was reversed by intrathecal administration of yohimbine at a dose of 26.7 μg/kg. The effect of yohimbine at a dose of 50 μg/kg was reversed by intrathecal injection of 20 μg/kg of the serotonergic receptor antagonist methysergide maleate. When performing antagonistic reactions, the administration of the antagonist was followed immediately by that of the agonist. The study indicates that for experimental purposes, intrathecal route of drug administration through the atlanto-occipital joint is effective in tortoises. The data also suggest that testudines have noradrenergic and serotonergic systems that appear to play a role in the modulation of pain in this species.