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The Nitric Oxide (NO) Donor Molsidomine Antagonizes Scopolamine and L-NAME-induced Performance Deficits in a Spatial Memory Task in the Rat

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Nitric oxide (NO) is considered as an intracellular messenger in the brain. Its involvement in learning and memory processes has been proposed. Compounds that inhibit NO synthase (NOS), the key synthesizing enzyme, may inhibit cognition, while NO donors may facilitate it. The present study was designed to investigate the effects of the NO donor molsidomine on rats' spatial memory. Thus, the ability of molsidomine (2 and 4 mg/kg, i.p.) in attenuating spatial memory deficits produced either by the muscarinic receptor antagonist scopolamine (0.2 mg/kg, s.c.) or by the NOS inhibitor L-NAME (30 mg/kg, i.p.) was assessed. For this aim, the object location test was selected. In a first study, molsidomine (4 mg/kg) counteracted the scopolamine-induced performance deficits in this spatial memory task. Subsequently, pre-training administration of molsidomine (4 but not 2 mg/kg) antagonized also the impairing effects produced by L-NAME in the object location paradigm. These results indicate that NO is involved in spatial recognition memory and that an NO component modulates the effects of the cholinergic system on spatial memory.