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Effects of intra-basolateral amygdala injection of dicyclomine (antagonist of muscarinic M1 receptors) and anastrozole (aromatase inhibitor) on inhibitory avoidance acquisition in adult male rats

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Background and Aims: A plethora of evidence indicates important effects of estrogen in learning and memory, which may be mediate in part by potentiation of cholinergic neurotransmition in brain areas involved in learning and memory such as amygdala. The current studies examine the role of dicyclomine (DIC) a M1 muscarinic antagonist and anastrozole (AN) an inhibitor of aromatase, the enzyme that produces estradiol from testosterone, and their interaction on acquisition of inhibitory avoidance task (IA).
Methods: Male Wistar rats were bilaterally cannulated into BLA and divided into 11 groups. Different groups received saline, DMSO, saline & DMSO as control groups, DIC (1, 5, 10, 15 and 30µg/0.5µl), AN (0.25 and 0.5µg/0.5µl) and DIC 10µg/0.5µl+AN 0.5µg/0.5µl before training in IA task. DIC was injected 10 min and AN was injected 20 min before training.
Results: Our results showed that both DIC at doses 10 , 15 and 30 µg/0.5µl and AN at dose 0.5µg/0.5µl significantly disrupted IA learning as indicated by significant decreased step-through latencies compared to the control group. The combination of drugs also decreased step-through latencies but this effect had no synergistic consequently.
Conclusions: These findings indicate that both M1 muscarinic receptors and aromatase activity in the BLA are involved in IA memory performance and their effects may occur in the same way. However, one possibility is that the severity of deficit induced by dicyclomine at dose 10 caused the co-administration of these drugs to have no synergistic impact on acquisition.

Keywords: Basolateral amygdala; Dicyclomine; Anastrozole; Passive avoidance aquisition