“PROCONVULSANT EFFECTS OF METHYLPHENIDATE ON PILOCARPINE-INDUCED SEIZURES IN MICE: INVOLVEMENT OF THE CHOLINERGIC SYSTEM”

Medeiros, D.P.F.1; Linhares, M.I.2; Venâncio, E.T.2; LIMA, C.N.C.2; Araújo, A.B.1; Aguiar, L. M.V.1; Fonteles, M.M.F.2

1 Medicine Faculty Of The Federal University Of Ceará, Fortaleza – Sobral/Ce - Brazil; 2Department of Physiology and Pharmacology, Federal University of Ceará, Fortaleza - Ce - Brazil;

INTRODUCTION: Methylphenidate (MFD) is a piperidine derivative that is structurally related to amphetamine. It is a psychostimulant widely used in Brazil for the treatment of Attention Deficit and Hyperactivity Disorder (ADHD). OBJECTIVE: This drug was investigated in the pilocarpine model and determination of acetylcholinesterase (AChE) in adult animals. METHODOLOGY: The effects of the MFD been evaluated in animal models of seizures induced by pilocarpine. The control group received saline. The MFD was administered acutely at doses of 2.5; 5; 10 and 20 mg / kg, po, followed by pilocarpine (400mg / kg, sc) in male adult mice (35-40g). The animals were observed 60 min after treatment. After the behavioral observation, animals were sacrificed and brain areas (hippocampus (HC) and Base Nucleus (NB)) were removed for analysis neurochemistry. RESULTS: There was reduction in seizure latency in animals pretreated with MFD at all doses [MFD2,5: 564,3±44,76 (8); MFD5: 632,3±46,90 (8); MFD10: 677,9±43,54 (14); MFD20: 696,0±25,99 (15)] when compared to pilocarpine group [P400: 875,7±42,80 (14)]. There was a decrease in the survival percentage in the groups pre-treated with MFD at all doses. P400 administration reduced the activity of AChE in the hippocampus and striatum when compared to control. Pretreatment with MFD (2.5 and 5 mg / kg) followed by P400 administration reduced AChE activity in the striatum compared to the control group [(CTRL = 141.8 ± 12.71 (n = 8); P400 = 48.76 ± 4.70 (n = 8); MFD2,5 + P400 = 64.48 ± 4.34 (n = 9); MFD5 + P400 = 56.50 ± 5.30 (n = 10); MFD10 P400 + = 136.7 ± 17.70 (n = 6); MFD20 P400 + = 143.0 ± 16.60 (n = 8)]. CONCLUSION: Our results suggest that MFD presented proconvulsant effects and that the cholinergic neurotransmitter system may play an important role in this effect.

Keywords: Seizures; methylphenidate; acetylcholinesterase