CURCUMIN PREVENTS EFFECTS OF CADMIUM ON PURINERGIC SYSTEM IN RATS CHRONICALLY EXPOSED TO CADMIUM

Costa, P.¹; Gonçalves, J.F.²; Abdalla, F.H.¹; Baldissareli, J.¹; Martins, C.C¹; Lopes, T.F.¹; Silva, A. D¹; Mânica, A. Schetinger, M.R.C.¹; Morsch, V.M.¹

1 Departamento de Bioquímica e Biologia Molecular, Universidade Federal de Santa Maria, Santa Maria, RS, Brazil;
2 Instituto Federal de Educação, Ciência e Tecnologia Farroupilha, Alegrete, RS, Brazil.

Cadmium (Cd) is one of the most toxic metals. Some studies on Cd toxicity have found an association with purinergic neurotransmission. Therefore, the use of compounds such as curcumin (Curc), derived from the rhizome of the turmeric (Curcuma longa Linn), which exerts neuroprotective effects against poisoning conditions is interesting. Thus, the aim was to investigate the influence of Curc on Cd poisoning by evaluating NTPDase and 5'-nucleotidase activity in brain of rats. Adult male Wistar rats received Cd (1 mg/kg) and/or Curc (30, 60 or 90 mg/kg) by gavage 5 days/week for 3 months. The animals were divided into 8 groups (n=4-7): saline/oil, saline/Curc30, saline/Curc60, saline/Curc90, Cd/oil, Cd/Curc30, Cd/Curc60 and Cd/Curc90.NTPDase and 5'-nucleotidase activities were determined in cerebral cortex synaptosomes (protocol under number: 114/2013). Data were analyzed by two-way ANOVA and Duncan's test (p<0.05). Results demonstrated that the group saline/Curc 60, saline/Curc 90, Cd/oil, and Cd/Curc 90 presented an increase of 88%, 93%, 117% and 91% in NTPDase activity and Cd-exposure caused a decrease of 39% in 5'-nucleotidase activity. The concentration 30 and 60 mg/kg of Curc prevented the increased in NTPDase activity, and the decrease in 5'-nucleotidase activity was abolished in the administration of Curc 60 and 90 mg/kg. The results suggest that Cd causes an increase in the NTPDase activity, leading the rapid hydrolysis of ATP and ADP in AMP, favoring adenosine production, a molecule with protective effect in the CNS. However, a decrease in 5'-nucleotidase activity, reduces the adenosine formation, which may lead to impairment on neuroprotective effects. In addition, the Curc administered in intoxicated rats prevented the increase in the NTPDase activity, increasing the extracellular concentration of ATP and ADP. Curc was able to prevent the effects of Cd on purinergic system, which is relevant since the regulation of these enzymes could have important potential therapeutic.

Keywords: Cd, Curc, purinergic system.
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