Dietary Supplementation with Ginger Varieties Prevent Inflammation and Alterations in Ectonucleotidases and Acetylcholinesterase Activities in Hypertensive Rats

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Inflammation exerts a crucial pathogenic role in hypertension and ginger rhizomes have been shown to exert anti-inflammatory effect. Hence, the present study sought to investigate the effects of two ginger varieties on activities of ectonucleotidases, adenosine deaminase (ADA) and cholinesterase activities as well as on cytokine levels in Nω-Nitro-L-arginine methyl ester hydrochloride (L-NAME)-induced hypertensive rats. The animals were divided into seven groups (n = 10): normotensive control rats; hypertensive (L-NAME) rats; hypertensive control rats treated with atenolol (10 mg/kg body weight/day); normotensive and hypertensive rats treated with 4% supplementation of red or white ginger, respectively. After 14 days of pre-treatment with both gingers the hypertension was induced in the animals by oral administration of L-NAME 40 mg/kg body weight. The results revealed a significant increase in ATP and ADP hydrolysis, ADA and cholinesterase activities from L-NAME hypertensive rats when compared with the control rats. In addition, an increase in serum pro-inflammatory cytokines [interleukin (IL-1 and IL-6), interferon (IFN)-γ and tumor necrosis factor-alpha (TNF-α)] with a concomitant decrease in anti-inflammatory cytokines [interleukin (IL-10)] was observed in L-NAME hypertensive rats. However, dietary supplementation with both ginger varieties was efficient in preventing these alterations by decreasing ATP hydrolysis, ACh degradation and pro-inflammatory cytokines in hypertensive rats. Thus, these activities could suggest possible insight about protective mechanisms of ginger rhizomes against hypertension-related inflammation.

Keywords: Ginger; hypertension; inflammation.