

Abstract ID: 66 for KRD 2020

PRELIMINARY STUDY ON THE EFFECT OF TUALANG HONEY AND ITS SILVER NANOPARTICLES ON KAINIC ACID-INDUCED MEMORY DEFICITS AND OXIDATIVE DAMAGE IN RAT HIPPOCAMPUS.

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ABSTRACT

Kainic acid (KA) mediated excitotoxicity has been shown to cause memory impairment and oxidative stress in rats brain. The aim of this study was to investigate the effect of Tualang honey (TH) and its silver nanoparticles (THSN) on the KA-induced memory deficits and oxidative damage in rats' hippocampus. Twenty-four adult male Sprague-Dawley rats were randomized into eight groups: (i) control, (ii) THSN (10mg/kg), (iii) THSN (50mg/kg), (iv) KA only, (v) KA+TH, (vi) KA+THSN (10mg/kg), (vii) KA+THSN (50mg/kg), and (viii) KA+Topiramate. Based on their respective groups, rats were pretreated orally with either distilled water, THSN (10 or 50 mg/kg body weight), Tualang honey (1.0 g/kg body weight), or Topiramate (40 mg/kg body weight), five times at 12 hours intervals. Saline or KA (15 mg/kg body weight) were injected subcutaneously 30 min after last oral treatment. Novel object recognition test (NORT) was performed for memory assessment. The rats were sacrificed 24 hours post KA induction and hippocampus was harvested. Malondialdehyde (MDA) and superoxide dismutase (SOD) were measured using commercially available ELISA kits. The results showed that there was a trend of decreased in MDA level in both TH and THSN groups, however there were no significance difference. There was significantly increased level in SOD following pretreatment with TH and THSN groups compared to KA only group. Interestingly, these pretreatment groups also demonstrated enhanced memory as evidenced by significant increase in recognition index in NORT when compared to KA only group. In conclusion, this preliminary finding suggests that the pretreatment with TH and THSN might have potential role to improve the memory and ameliorate oxidative stress in the KA-induced excitotoxicity rats. However, further study needs to be carried out to understand the precise mechanism.

Keywords: Tualang honey, silver nanoparticles, excitotoxicity, hippocampus, oxidative stress