Protective effect of Tualang honey against cadmium-induced morphological abnormalities and oxidative stress in the ovary of rats

ABSTRACT

Background: To investigate the protective effects of Tualang honey against the toxicity effects induced by cadmium (Cd) on the ovary.

Methods: A total of 32 female Sprague Dawley rats were taken and randomly divided into four groups (n = 8). Throughout the experimental period of 6 weeks, negative control-NC (vehicle deionized water), positive control-CD (Cd at 5 mg/kg), Tualang honey followed by Cd exposure-TH (Tualang honey at 200 mg/kg and Cd at 5 mg/kg) and Tualang honey control-THC (Tualang honey at 200 mg/kg) groups, were administered orally on a daily basis.

Results: Rats exposed to Cd were significantly higher in ovarian weight, number of antral and atretic follicles as compared to the NC group. The disruptive effects of Cd on ovarian follicles were associated with a disruption in gonadotropin hormones and decreases in follicular stimulating hormone (FSH) and luteinizing hormone (LH). Moreover, a significant formation of oxidative stress in ovarian Cd-exposed rats has been proven by increasing the level of lipid peroxidation products (malondialdehyde) and decreasing the levels of enzymatic antioxidant (catalase). Interestingly, a daily supplementation of high antioxidant agents such as Tualang honey in these animals, caused significant improvements in the histological changes. Additionally, less atretic follicles were observed, restoring the normal level of LH and FSH ($P < 0.001$), and normalizing the ovarian malondialdehyde ($P < 0.05$) and catalase levels in comparison with CD group ($P < 0.05$).

Conclusions: Tualang honey has protective effects against Cd-induced ovarian toxicity by reducing morphological abnormalities, restoring the normal levels of gonadotropin hormones and stabilizing equilibrium levels of lipid peroxidation and antioxidant enzyme in ovaries of rats.

Keyword: Tualang honey; Cadmium; Ovary; Antioxidant; Oxidative stress