Malaysian Bee Bread Attenuates Apoptosis and Improves Cell Proliferation in Testis of High-Fat Diet-Induced Obese Rats

Joseph Bagi Suleiman[1, 3], Ainul Bahiyah Abu Bakar[1], Mahaneem Mohamed[1, 2]

[1]Department of Physiology, School of Medical Sciences, Universiti Sains Malaysia, Kubang Kerian, Kelantan, Malaysia;[2]Unit of Integrative Medicine, School of Medical Sciences, Universiti Sains Malaysia, Kubang Kerian, Kelantan, Malaysia;
[3]Department of Science Laboratory Technology, Akanu Ibiam Federal Polytechnic, Unwana, Afikpo Ebonyi State, Nigeria

ABSTRACT

Introduction: Obesity has been reported to impair male reproductive function and testicular apoptosis while bee bread has been traditionally consumed to enhance male fertility.

Objective: The objective of this study was to determine the effects of Malaysian bee bread on apoptosis and proliferation of testicular germ cells in high-fat diet-induced obese rats.

Methods: Twenty-four adult male Sprague Dawley rats weighing between 250-300 g were randomised into four groups (n=6/group), namely normal control (NC), high-fat diet (HFD), HFD plus bee bread (HFD+B) and HFD plus an anti-obesity drug orlistat (HFD+O) groups. Bee bread (0.5g/kg/day) and orlistat (10 mg/kg/day) were suspended in distilled water and given by oral gavage for 12 weeks. Markers for apoptosis and proliferation of testicular germ cells were assessed.

Results: mRNA transcript levels of caspase-3, caspase-8, caspase-9, p53 and Bax/Bcl2 ratio in the testis of HFD group were significantly increased while immunohistochemical staining of cleaved caspase-3 increased and proliferating cell nuclear antigen (PCNA) immunoexpressions decreased relative to NC group.
Treatment with bee bread significantly decreased the apoptotic markers, significantly decreased mRNA transcript levels of anti-apoptotic markers (Bcl2) and increased PCNA immunoexpression in HFD+B, relative to NC group and HFD+O.

Conclusion: Bee bread improved proliferation of testicular germ cells by attenuating apoptosis in high-fat diet-induced obese male rats.

Keywords: Bee bread, high-fat diet, testis, apoptosis