

Effect of Kelulut honey supplementation on bone health in male rats on high-carbohydrate high-fat diet

ABSTRACT

Purpose: To determine the effects of Kelulut honey (KH) on the bone health of rats with metabolic syndrome. **Methods:** Male Wistar rats were randomized into normal control and metabolic syndrome s fed with a diet enriched with carbohydrate and fat. The rats in the metabolic syndrome arm were further assigned into the negative control group and honey group supplemented orally with Kelulut honey (1g/kg) daily for eight weeks. After the rats were sacrificed, the trabecular and cortical micro-architecture of the harvested femur was analysed using X-ray micro-computed tomography, while histomorphometric method was used to determine bone cell indices. Femoral biomechanical properties were analysed using a universal mechanical tester. **Results:** Total cross-sectional area, osteoid surface and volume, displacement and strain reduced significantly, while eroded surface increased significantly in the rats with metabolic syndrome than the normal rats ($p < 0.05$). The honey group showed a significant reduction in osteoclast surface than the normal healthy control ($p < 0.05$). Other skeletal parameters did not show a significant intergroup difference. **Conclusion:** Metabolic syndrome is harmful to bone health and honey has limited effects in reversing these negative effects.