

TRIHONEY AMELIORATES OXIDATIVE STRESS IN ATHEROSCLEROTIC AORTA

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ABSTRACT

Oxidative stress is one of the mechanisms involved in the pathogenesis of atherosclerosis. Reactive oxygen species (ROS) are implicated in various pathogenic signalling pathways underlying vascular inflammation. Antioxidant enzymes such as superoxide dismutase (SOD) and glutathione peroxidase (GPx) play a significant role in protecting against harmful effects of ROS. Honey has been shown to function as antioxidant through suppression of oxidative stress and radical scavenging ability. This study aims to explore the antioxidant potential of Trihoney (Combination of three types of honey, namely: Trigona, Mellifera, and Dorsata) on oxidative stress in atherosclerotic plaques of hypercholesterolemic rabbits. Thirty male New Zealand white rabbits were assigned into 5 groups as follows: normal diet (C), normal diet with 0.6g/kg/day of Trihoney (C+H), 1% cholesterol diet (HC), 1% cholesterol diet with 0.6g/kg/day of Trihoney (HC+H), and 1% cholesterol diet with 2mg/kg/day of atorvastatin (HC+At). All animals were sacrificed after 12 weeks of treatment upon confirmation of hypercholesterolemia. The atherosclerotic aorta was harvested and homogenised. Activities of SOD and GPx were determined in aorta homogenate by enzyme assay kits. Aorta homogenate malondialdehyde (MDA) concentration was determined by enzyme-linked immunosorbent assay kit. Untreated hypercholesterolemic group HC showed it suppressed SOD and GPx activities, in addition to significant ($p < 0.001$) elevation of MDA concentration. The atherogenic group treated with Trihoney demonstrated significant ($p < 0.01$) enhanced activities of both SOD and GPx compared to HC group. Treatment with atorvastatin significantly ($p < 0.001$) enhanced GPx activity as compared to all other treated and untreated groups. Trihoney supplemented group, and atorvastatin treated group demonstrated significant ($p < 0.001$) reduction in MDA concentration compared to the HC group. **Conclusions:** Trihoney has the potentials to enhance antioxidant enzyme activity and ameliorates the oxidative stress in the atherosclerotic aorta.

Keywords: Atherosclerosis, Oxidative stress, Trihoney, Atorvastatin.