

# Curcumin Supplementation Ameliorated Vascular Dysfunction and Antioxidant Status in High Sucrose, High Fat Fed Rats

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## ABSTRACT

Vascular endothelial dysfunction is a potential risk factor for cardiovascular diseases. This study evaluated the effect of curcumin on vascular dysfunction relative factors using rats fed on high sucrose, high fat (HSF) diet. The experiment was conducted in two animal feeding stages. In the first feeding phase, male Sprague-Dawley rats were randomly divided into two groups: control group (n=8) was fed on AIN-93G diet and HSF group (n=24) was fed on HSF diet for 8 weeks to induce obese status. In the second feeding phase lasting 4 weeks, HSF group was further randomly subdivided into three subgroups: O group (n=8) continued feeding on HSF diet; OA group (n=8) had HSF diet replaced with AIN-93G diet; and OC group (n=8) was fed on HSF diet supplemented with curcumin (300mg/kg body weight/day). After 8 weeks, HSF diet significantly elevated levels of AST, ALT, insulin, HOMA-IR, LDL-C, Hcy, CRP, VCAM-1 and ICAM-1, but significantly reduced levels of NO and HDL-C. After dietary intervention, OA and OC groups exhibited significantly lower levels of AST, ALT, HOMA-IR, cholesterol, LDL-C, Hcy, CRP, VCAM-1 and ICAM-1, and higher levels of NO and CAT activity compared to those of O group. SOD, CAT and GPx activities were increased in OA group. CAT levels were enhanced in OC group. In conclusion, this study showed curcumin supplementation and dietary replacement can inhibit HSF diet-induced vascular dysfunction potentially through enhanced NO production and antioxidant enzymes activities, thereby leading to suppressed inflammation and oxidative damage in the vascular endothelium.