Documents

Mohamadin, A.M.[a b] , Elberry, A.A.[c] , Gawad, H.S.A.[d] , Morsy, G.M.[e] , Al-Abbasi, F.A.[f]

Protective effects of simvastatin, an HMGCoA reductase inhibitor, against oxidative damage in experimental diabetic rats

(2011) *International Journal of PharmTech Research*, 3 (3), pp. 1780-1795.

[a] Department of Chemistry for Health Sciences, Deanery of Academic Services, Taibah University, Al-Madinah, Saudi Arabia
[b] Biochemistry Dept, Faculty of Pharmacy, Al-Azhar University, Nasr City, Cairo, Egypt
[c] Department of Clinical Pharmacy, Faculty of Pharmacy, King Abdulaziz University, Jeddah, Saudi Arabia
[d] Department of Physiology, College of Medicine, Taibah University, Al-Madinah, Saudi Arabia
[e] Biochemistry Department, Applied Science College, Taibah University, Al-Madinah, Saudi Arabia
[f] Department of Biochemistry, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract
The role of oxidative stress has been reported in various diabetic complications. The present study was undertaken to evaluate the possible protective effects of simvastatin (SMV), a HMG-CoA reductase inhibitor against oxidative stress in streptozotocin (STZ) induced diabetic rats. Diabetes induced in rats by a single intraperitoneal injection of STZ (6o mg/Kg). A dose of 10 mg/kg of either SMV or glibenclamide (0.6 mg/kg) was orally administered 3 days prior to STZ administration and these supplementations were continued to the end of the study (5 weeks). The effects of SMV on blood glucose, hemoglobin (Hb), glycosylated hemoglobin (HbA1c), urea, serum creatinine, aspartate aminotransferase (AST), alanine aminotransferase (ALT), lipid profiles, glutathione (GSH) and vitamin C were measured. Reduced GSH, thiobarbituric acid reactive substances (TBARS), superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GSH-Px) were measured in the liver and renal tissues. At the end of experiment, fasting blood glucose, HbA1c, BUN, creatinine, AST, ALT and lipid profiles were significantly increased, whereas Hb, GSH and vitamin C were significantly decreased in diabetic rats. Moreover, liver and renal tissue TBARS was markedly increased while GSH, SOD, CAT and GSH-Px were significantly decreased. In vitro studies on the effect of SMV on scavenging 1,1-diphenyl-2-picrylhydrazyl (DPPH) and total antioxidant capacity (TAC) also confirmed the free radical scavenging and antioxidant activity of SMV. Oral administration of SMV improved the lipid profile, liver and renal function tests. Tissue GSH, SOD, CAT and GSH-Px were significantly increased while TBARS was markedly reduced. Therefore, the present results revealed that SMV has a protective effect against STZ-induced oxidative damage by scavenging the free radicals generation and enhancement of the antioxidant defense mechanisms.

Author Keywords
Diabetes; Oxidative stress; Simvastatin; Streptozotocin

Document Type: Article
Source: Scopus