Introduction

There has been a steady increase in the epidemiology of obesity over the last 30 years with developed countries leading the way (Dixon, 2010). In conjunction with alarming rise in obesity to epidemic proportions, related complications such as insulin resistance, oxidative stress and inflammation represent a major risk factor for a number of chronic diseases including type-2 diabetes, cardiovascular diseases and cancer (André and Gonthier, 2010).

Oxidative stress is an imbalance between tissue free radicals, reactive oxygen species (ROS) and antioxidants, and might be a key mechanism underlying obesity-related co-morbidities (Vincent et al. 2007). Numerous research studies have recommended that obesity is associated with enhanced oxidant stress (Yesilbursa et al. 2005; Mohn et al. 2005) i.e. enhanced free radical production and/or depleted cellular antioxidant defense systems (Powers et al. 2004). Possible mechanisms contributing to the obesity associated oxidant stress include augmented oxygen consumption and subsequent radical production via mitochondrial respiration, diminished antioxidant capacity, elevated fat deposition and cell injury causing amplified rates of radical formation such as $O_2^-$ and $OH^-$ (Vincent et al. 2001).

Numerous studies have shown the modifications of lipid and lipoprotein metabolism in obese subjects.
Effect of rosuvastatin on obesity-induced cardiac oxidative stress in Wistar rats—A preliminary study

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The prevalence of obesity has been rising alarmingly and it has now become a global concern causing an enormous economic burden on the health care system. Obesity is generally linked to complications in lipid metabolism and oxidative stress. The aim of the present study was to investigate the effect of rosuvastatin (10 mg/kg, po) on obesity-induced oxidative stress in high fat-fed Wistar rats. Oral administration of rosuvastatin (10 mg/kg) for 21 days along with high fat diet brought about significant elevation in serum high density lipoprotein and cardiac antioxidant enzymes levels (superoxide dismutase, catalase, glutathione, glutathione peroxidase, glutathione peroxidase-, glutathione reductase- and glutathione-S-transferase) while decreasing in serum lactate dehydrogenase, apolipoprotein-B, lipids (triglycerides, total cholesterol, low density lipoprotein-cholesterol, very low density lipoprotein-cholesterol and atherogenic index) and cardiac thiobarbituric acid reactive substances levels. The results were comparable with orlistat, a standard antiobesity drug. These preliminary results for the first time demonstrate that administration of rosuvastatin can be beneficial for the suppression of obesity-induced oxidative stress and dyslipidemia in high fat-fed Wistar rats.

Keywords: Antioxidants, Apo-B, High fat diet, LDH, Lipid peroxides, Obesity

Pharmacological agents are often used in the treatment of obesity. At present, there are only two Food and Drug Administration (FDA)–approved long-term-use antiobesity drugs viz. orlistat and sibutramine. Their use is often associated with gastrointestinal or cardiovascular and central nervous system side effects (elevated blood pressure, dry mouth, constipation, headache and insomnia)4,5. Thus, there is a need for the discovery and development of novel, safe, and effective drugs for the control and treatment of obesity.

Statins, inhibitors of 3-hydroxy-3-methylglutaryl coenzyme A (HMG-Co A) reductase, are the most commonly used drugs for the management of hypercholesterolemia and have become standard medical remedy in the armamentarium available for the prevention and management of cardiovascular disease. Statins were first developed in order to lower total serum cholesterol and improve the lipid profile but have consequently been shown to put forth a variety of beneficial, ‘pleiotropic’ effects, particularly related to cardiovascular disease, including improved endothelial function, reduced oxidative stress, less platelet adhesion and atherosclerotic plaque stabilisation6. The stability of tissues against oxidative stress in cardiovascular and lipid metabolic disorders

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