Hypolipidemic, Hepatoprotective and Renoprotective Effects of Cydonia Oblonga Mill. Fruit in Streptozotocin-Induced Diabetic Rats

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Abstract

Diabetes mellitus is associated with complications in several different systems of the body, and the incidence of diabetes is rapidly increasing worldwide. The objective of the present study was to evaluate the effect of aqueous extract of Cydonia oblonga Mill. fruit on lipid profile and some biochemical parameters in streptozotocin-induced diabetic rats. The extract showed antihyperlipidemic activity as evidenced by significant decreases in serum triglyceride, total cholesterol, and low density lipoprotein cholesterol (LDL-C) levels along with the elevation of high density lipoprotein cholesterol (HDL-C) in the diabetic rats. The biochemical liver functional tests were also analyzed and it was shown that serum biomarkers of liver dysfunction, including alanine transaminase (ALT), aspartate transaminase (AST), and alkaline phosphatase (ALP) were significantly reduced in aqueous extract of Cydonia oblonga Mill. treated diabetic rats. In addition, our results showed that the oral administration of the extract prevented diabetes-induced increase in serum urea and creatinine levels as the markers of renal dysfunction. In conclusion, the present study indicates that aqueous extract of Cydonia oblonga Mill. is able to improve some of the symptoms associated with diabetes and possesses hypolipidemic, hepatoprotective, and renoprotective effects in streptozotocin-induced diabetic rats.

Keywords: Cydonia oblonga Mill; Diabetes; Hepatoprotective; Hypolipidemic; Renoprotective.

Introduction

Diabetes mellitus is a worldwide epidemic with considerable health and economic consequences that affects nearly 10% of the population (1, 2). This serious metabolic disorder remains a leading cause of cardiovascular diseases, blindness, end-stage renal failure, and hospitalizations. The disease characterized by chronic hyperglycemia and disturbances in fat and protein metabolism (3). Hyperglycemia is typically accompanied by progressive development of microvascular and macrovascular complications, causing morbidity and mortality in diabetic patients (4).

Diabetes is also associated with abnormalities in serum lipids and it was shown that elevated levels of total cholesterol, triglyceride, low density lipoprotein cholesterol (LDL-C) as well as low concentration of high density lipoprotein