

Antioxidant Effect of Curcumin Extracts in Induced Diabetic Wister Rats

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Abstract: This study aimed to determine the protective effect of curcumin on streptozotocin (STZ)-induced oxidative stress in various tissues of albino Wister rats. Adult male rats (8 weeks), weighing 195 to 225 g was made diabetic by injecting STZ (65 mg kg⁻¹ body weight) intraperitoneally. During the whole experimental period, animals were fed with a balanced commercial chow and water ad libitum. Diabetic rats given either water or ethanolic curcumin extracts (80 mg kg⁻¹ body weight) in aqueous suspension daily for a period of seven weeks. The levels of oxidative stress parameters and activity of antioxidant enzymes were determined in various tissues. STZ-induced hyperglycemia resulted in increased glucose level, glycosylated haemoglobin in red blood cells and other tissues and altered antioxidant enzyme activities such as AST and ALT. These elevated blood parameters and enzymatic activities induced by hyperglycemia were significantly restored to near normal by oral administration of curcumin once daily for 7 weeks, as compared to untreated rats. There was a significant elevation in the level of liver and kidney malondialdehyde (MDA), while the activities of antioxidant enzymes superoxide dismutase and catalase (SOD and CAT) were significantly decreased in STZ rats which also restored to normal after curcumin treatment. The results obtained indicated that ethanolic extract has more potent protective action than water extract against all hyperglycemic parameters. Biochemical observations were supplemented by histopathological examination of liver and kidney sections. Interestingly, feeding curcumin to the diabetic rats controlled oxidative stress by inhibiting the increase in TBARS and protein carbonyls and reversing altered antioxidant enzyme activities without altering the hyperglycemic state in most of the tissues. So, curcumin appear to be beneficial in preventing diabetes-induced oxidative stress in rats despite unaltered hyperglycemic status.

Key words: Hyperglycemic parameters, curcumin extracts, oxidative stress, diabetic rats

INTRODUCTION

Hyperglycemia causes the autoxidation of glucose, glycation of proteins and the activation of polyol metabolism. These changes accelerate generation of Reactive Oxygen Species (ROS) and increases in oxidative chemical modification of lipids, DNA and proteins in various tissues. Oxidative stress may play an important role in the development of complications in diabetes such as lens cataracts, nephropathy and neuropathy. Glycation

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