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SILYMARIN AND METFORMIN COMBINATION ATTENUATES DIABETIC NEPHROPATHY THROUGH ITS ANTIOXIDANT ACTIVITY

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Objectives: Reactive oxygen species (ROS) produced from the oxidative stress plays a phenomenal and crucial role for development of diabetes and its associated complications such as cardiomyopathy and nephropathy. Herbal molecules probably represent an ideal source to develop safe and effective agents for the treatment of diabetes. In context to this, the present study was designed to evaluate the combined effect of silymarin and metformin on diabetic nephropathy through its antioxidant activity.

Methods: Diabetes in rats was induced by high fat diet and low dose of streptozotocin (35 mg/kg) in Wistar rats. The levels of urinary sodium, creatinine, albumin and blood urea nitrogen (BUN) were estimated as a measure of nephropathic markers. Various lipid parameters from plasma and levels of enzymatic and non-enzymatic activities in kidney homogenate were estimated as a measure of diabetic and oxidative stress markers, respectively. Further, histological evaluation of kidney was also carried out.

Results: Combined treatment with metformin (50 mg/kg) and silymarin (25 mg/kg, 50 mg/kg and 100 mg/kg) showed antidiabetic activity by significantly decreasing in blood glucose, cholesterol, TG and LDL-C and increasing HDL-C levels. Diabetic rats also found to have significant increase in levels of urinary albumin, creatinine, BUN and decrease in levels of sodium. Treatment also showed renoprotective activity as evidenced by significant reduction in levels of urinary albumin, creatinine, BUN and increase in levels of sodium. Moreover, it also significantly decreased LPO and NO, while increased in the superoxide dismutase, catalase, glutathione, and total thiol levels in kidney homogenate. Further, histopathological examinations of kidney section revealed decrease in glomerular lesions, mesangial expansion and tubular atrophy.

Conclusions: The results suggest that combination of silymarin (100 mg/kg) and metformin (50 mg/kg) have marked antidiabetic and renoprotective activity against type II diabetes and its complication that is mediated through its free radical scavenging activity.