

## Evaluation of silymarin and melatonin protective effects in the kidney of streptozotocin-induced diabetic rats: biochemical and histopathological studies

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**Background and Aims:** The aim of current study was to investigate the protective effects of silymarin (SMN), melatonin (MEL) individually and in combination on STZ-induced oxidative stress that occurs in kidney of diabetic rats.

**Methods:** Thirty male Wistar rats were divided to different groups including: control (C), untreated diabetic (D), SMN-treated diabetic (SMN, 50 mg/kg, orally), MEL-treated diabetic [10 mg/kg, intraperitoneally (i.p.)] and SMN- and MEL-treated diabetic (S+M). Diabetes was induced by a single-dose of STZ injection (50 mg/kg, i.p.). The animals received either vehicle or test compounds immediately after diabetes induction for 4 weeks. Blood glucose concentration was measured in daily base on first week and both blood glucose and body weight were monitored weekly and at the end of experiment. The level of nitric oxide (NO), total thiol molecules (TTM) and malondialdehyde (MDA) concentrations as chemical biomarkers of oxidative stress were measured in the kidney tissue. To confirm the biochemical alterations the histopathologic examinations in renal tissue were performed.

**Results:** Both SMN and MEL not only reduced significantly ( $P < 0.05$ ) the diabetic-related increase of NO and MDA but also remarkably elevated the STZ-reduced TTM level. The histopathological findings did not support the protective effects of SMN on antioxidant status in the kidney as SMN individually was not able to reduce hyalan casts indicating severe injuries of the glomeruli. While MEL could decrease significantly the amount of hyalan casts especially in the proximal tubules. Furthermore in SMN plus MEL-treated diabetic group some hyalan cast droplets were observed.

**Conclusions:** our data suggest that SMN only recovered the STZ-altered oxidative stress biomarkers while MEL could improve both the biochemical and histopathological changes in diabetic rats.

**Keywords:** Diabetes; Kidney; Melatonin; Silymarin