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Silymarin, the Antioxidant Component of *Silybum Marianum,* Protects against Oxidative Organ Injury in a Rat Model of Sepsis

Hale Z. Toklu[1], Ayliz Velioglu-Ogunc[2], Nursal Gedik[3], Meral Keyer Uysal[1], Goksel Sener[1]

[1]Dept. of Pharmacology, School of Pharmacy, Marmara University; [2]Vocational School of Health Related Professions; [3]Kasimpasa Military Hospital, Division of Biochemistry, Istanbul, Turkey

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INTRODUCTION

Recent studies have shown that sepsis is associated with enhanced generation of reactive oxygen metabolites, which lead to multiple organ dysfunction. Based on the potent antioxidant effects of silymarin, we investigated the putative protective role of silymarin against sepsis-induced oxidative organ damage.

MATERIALS AND METHODS

Sepsis was induced by cecal ligation and puncture (CLP) in Spraque Dowley rats. Sham operated (control) and CLP group had received either saline or silymarin (50 mg/kg, sc) 30 min prior the operation. Six hours after the surgery, rats were decapitated and the biochemical changes were evaluated in brain and lung tissues by malondialdehyde (MDA), glutathione (GSH) levels, and myeloperoxidase (MPO) activity. Formation of reactive oxygen species in tissue samples was monitored by using chemiluminescence (CL) technique with luminol and lusigenin probe. Total antioxidant capacity, lactate dehydrogenase (LDH), tumour necrosis factor- α (TNF-α), interleukin-1β, and IL-6 levels were assayed in blood samples.

RESULTS

Brain and lung MDA levels and MPO activity in the CLP group were significantly increased ($p<0.001$) with concomitant decreases in GSH levels ($p<0.001$), when compared to control group. Silymarin treatment significantly reversed ($p<0.001$) the elevations in MDA levels while the reduced GSH levels were increased back to control levels ($p<0.01$-$p<0.001$). Furthermore luminol and lucigenin CL were significantly ($p<0.05$-$p<0.001$) increased in CLP group. The increased LDH, TNF-α, and interleukins in CLP group were significantly ($p<0.05$-$p<0.001$) reduced by silymarin treatment.

CONCLUSION

The protective effects of silymarin may be due to its ability to inhibit neutrophil infiltration and to balance oxidant-antioxidant status. Thus, silymarin have a therapeutic value in limiting sepsis-associated multiple organ damage.