ABSTRACT

THE EFFECT OF INTRAVENOUS N-ACETYLCYSTEINE (NAC) ON MALONDIALDEHYDE (MDA) LEVEL AND RENAL TUBULAR NECROSIS IN GLYCEROL-INDUCED RAT (*RATTUS NORVEGICUS)*

Oxidative injury produced via Fenton reaction and myoglobin redox cycle plays crucial role in the pathogenesis of myoglobinuric acute kidney injury (AKI). It may directly damage renal tubules as well as generate lipid peroxidation products with vasoconstrictor properties. *N-acetylcysteine* (NAC) is an antioxidant, that has been proven for the protective effects in many experimental models of renal injury and also the improvement of renal microcirculation. The aim of this study was to scrutinize any possible protective effect of NAC in glycerol induced rat model by measuring tissue malondialdehyde (MDA) and examining tubular necrosis, and to explore whether the effect was dose-related or not.

Methods : Male Wistar rats were divided into five groups: 1) saline control group, (2) glycerol (50%, 8ml/kg, i.m) plus saline i.v group, 3) glycerol plus NAC (100 mg/kg)-treated group, 4) glycerol plus NAC (200 mg/kg)-treated group, 5) glycerol plus NAC (400 mg/kg)-treated group. Rats were sacrificed at 24 h after glycerol injection, and renal tissues were harvested for measuring MDA via TBA method as well as making histopathologic slides.

Results : Glycerol administration significantly increased renal tissue MDA and tubular necrosis, however NAC administration prevented the MDA increment. There were significant differences between glycerol+NAC treated groups with glycerol alone treated group but there were no significant differences between glycerol+NAC groups with the conrol group. Intravenous administration of NAC also reduced tubular necrosis since there were significant differences between glycerol+NAC treated groups with glycerol group. There were no significant diferences of tissue MDA level and tubular necrosis percentage among NAC 100, 200 and 400 group. However there was a significant correlation between NAC dose with tissue MDA level. There was no significant correlation between NAC dose with tubular necrosis.

Conclusion : NAC was found to attenuate lipid peroxidation as well as renal tubular necrosis in this glycerol induced rat model, and NAC 100 mg/kg was the recommanded dose.

Key words : myoglobin, acute kidney injury, N-Acetylcysteine, MDA, tubular necrosis