EFFECT OF N-ACETYLCYSTEINE COMBINED WITH EXOGENOUS SURFACTANT IN DOUBLE-HIT MODEL OF LUNG INJURY IN RATS

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Hyperoxia and subsequent accumulation of reactive oxygen species (ROS) together with secondary bacteria-induced inflammation lead to lung damage. N-acetylcysteine (NAC) is an antioxidant that in combination with a pulmonary surfactant may improve lung function. Therefore, we aimed to compare the efficacy of NAC combined with exogenous surfactant in the experimental double-hit model of lung injury.
Bacterial lipopolysaccharide (LPS; 500µg/kg) instilled intratracheally and hyperoxia were used to induce lung injury in adult Wistar rats. Animals were treated with intravenous (i.v.) NAC (10 mg/kg) alone or with i.v. NAC in combination with intratracheal surfactant (PSUR+NAC) (poractant alpha, 50mgPL/kg). Control received saline. After 4 hours of ventilation, inflammatory markers, oxidative damage, total white blood cell (WBC) count and lung oedema were evaluated.
Hyperoxia and LPS increase lung IL-1ß, TNF-α, IL-6, TBARS, AOPP, lung oedema and decrease total antioxidant capacity (TAC) and total WBC count. In LPS-treated animals, NAC increases TAC and decreases IL-6. This effect is potentiated by combined administration of exogenous surfactant and NAC. In addition, PSUR+NAC improved TNF-α, IL-1ß and TAC compared to NAC only.
Combination of exogenous surfactant with NAC suppresses lung inflammation and oxidative stress in the experimental double-hit model of lung injury.

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