

The effect of carvacrol in Oleic Acid induced acute lung injury in rats

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Objective: This study was conducted to compare the effects of oleic acid on the antioxidant systems of lung muscle tissue and carvacrol which has been proven to have healing effects on tumors of the lung, liver, breast, and testis and is known to have antioxidant effects, with respect to their healing and protective properties.

Methods: 28 male rats of the Wistar type (250-350 grams) were included in the study. They were divided to four groups. Group I: Group oleic acid (n: 7, 50 µl of oleic acid were administered to the oleic acid group and 30 minutes later 73 mg/kg of saline solution was given intraperitoneal as the same volume as carvacrol) Group II: Group oleic acid+carvacrol (n:7, 50 µl of oleic acid was administered to the oleic acid and thirty minutes after the injection 73 mg/kg of carvacrol was administered intraperitoneal. Group III: Group control (n: 7, 50 µl of saline solution (the same dose as the oleic acid group) was administered and thirty minutes after the injection 73 mg/kg of saline solution was administered intraperitoneal. Group IV: Group carvacrol: (n: 7, 50 µl of intravenous saline solution was administered and 30 minutes after the injection 73 mg/kg carvacrol was administered intraperitoneal). After being held in the oxygen room for 4 hours, blood and tissue samples were collected from the rats. Two histologists who were unaware of the group assignments assessed the acute lung injury via light microscopy; interstitial oedema, alveolar haemorrhage, intraalveolar neutrophils, intraalveolar macrophages and intraalveolar pneumocytes and electron microscopy; the integrity of the blood-gas barrier, the morphology of the type 1 and type 2 pneumocytes, and the presence of intraalveolar macrophages and granular material. The lung tissue was examined histopathologically and levels of protein carbonyl, malondialdehyd tissue, catalase (CAT), glutathione peroxidase (GSH-Px) and superoxide dismutase (SOD) which are known as oxidant, anti-oxidant parameters were measured. Levels of anti-inflammatory cytokines such as interleukin (IL)-6, IL-10, Tumor necrosis factor (TNF)-α and granulocyte colony stimulating factor (G-CSF) were measured in the blood samples.

Results: Oleic acid caused significant total lung injury compared to the control group and to the vehicle group and levels of protein carbonyl and malondialdehyd were higher than the other groups. Total lung tissue damage score, protein carbonyl, CAT, GSH-Px, SOD, levels were found to be similar in oleic acid and oleic acid+carvacrol groups. Levels of MDA tissue was lower in carvacrol and oleic acid+carvacrol groups than oleic acid group. Levels of proinflammatory and inflammatory cytokines IL-6, IL-10, TNF-α and G-CSF were found to be similar in both groups.

Conclusion: As a result it has been shown that because of the antioxidant effects of carvacrol in lung tissue the increased use of carvacrol may be helpful in preventing and reversing lung tissue damage.

Biography

Ozkan Onal has completed his medical education from Ankara Gazi University Medical School and he has completed his anesthesia training from Ankara Hacettepe University Medical School and he is working in Ankara Yuksek Ihtisas training and educational hospital. He has published more than 15 papers about anesthesia.

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