

Anethum graveolens Prevents Liver and Kidney Injury, Oxidative Stress and Inflammation in Mice Exposed to Nicotine Perinatally

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Abstract : Perinatal exposure to nicotine imbalances the redox status in newborns. This study investigated the effect of Anethum graveolens (dill) extract on oxidative stress and tissue injury in the liver and kidney of mice newborns exposed to nicotine perinatally. Pregnant mice received nicotine (0.25 mg/kg) on gestational day 12 to day 5 after birth and/or A. graveolens extract on a gestational day 1 to day 15 after birth. Newborn mice exposed to nicotine showed multiple histopathological alterations in the kidney and liver, including inflammatory cell infiltration and degenerative changes. Nicotine exposure increased hepatic and renal reactive oxygen species (ROS), lipid peroxidation, tumor necrosis factor (TNF- α), interleukin-6 (IL-6), and inducible nitric oxide synthase (iNOS) ($p < 0.001$), and decreased antioxidant defenses ($p < 0.001$). A. graveolens supplementation significantly prevented liver and kidney injury, suppressed ROS generation ($p < 0.001$), lipid peroxidation ($p < 0.001$), and inflammatory response ($p < 0.001$), and enhanced antioxidant defenses. In addition, A. graveolens upregulated hepatic and renal Nrf2 and HO-1 mRNA and increased HO-1 activity in normal and nicotine-exposed mice. In conclusion, A. graveolens protects against perinatal nicotine-induced oxidative stress, inflammation, and tissue injury in the liver and kidney of newborn mice. A. graveolens upregulated hepatic and renal Nrf2/HO-1 signaling and enhanced antioxidant defenses in mice.

Keywords : dill, oxidative stress, cytokines, nicotine

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