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The Protective Effect of N-acetyl Cysteine on Mitochondrial Copy Number of Salivary Glands after Induction of Oxidative Stress in Albino Rats

ABSTRACT

Background: Oxidative stress is defined as condition when reactive oxidative species generation exceed the physiological level, and overcome the antioxidant capacity which lead to biomolecules damage, excessive peroxidation of lipid, damage of DNA strands ,impairs gene expression, mitochondrial dysfunction and play a main role in the pathophysiology of many diseases. **Aim of the study:** This study was aimed to investigate protective role of N-acetyl cysteine (NAC) as antioxidant on mitochondrial gene expression and copy number against oxidative stress damage in salivary glands **Material and Methods:** Forty adult male albino rats were used in this study. Animals were divided into 4 groups: Group1 (Control negative, n=10): Normal diet and tap water for drinking intraperitoneally for 4weeks. Group2: (Control positive, H2O2) (n=10) normal diet and drinking water contain 0.5% H2O2 daily to induce oxidative stress for 4weeks. Group3: N-acetyl cysteine (NAC, n=10) normal diet and tap water for drinking injected daily with NAC 150 mg /kg (i.p.) For 4weeks. Group4: (Protected group) (NAC+H2O2) (n=10) normal diet and drinking water contain 0.5% H2O2 daily to induce oxidative stress, injected daily with NAC 150 mg. /kg (i.p.) for 4weeks. Tissues were collected after 4 weeks of experiment, all animal groups were euthanized and salivary glands were removed for genomic and histopathologic study**. Result:** The results showed that oxidative stress induced by H2O2 cause significant reduction in the mitochondrial copy number in salivary gland tissue and induce severe necrosis and degeneration in control positive group while protected group with NAC showed no significant changes in mitochondrial copy number and no necrosis or degeneration in salivary gland tissue **Conclusion:** N-acetyl cysteine protects the mitochondrial copy number of salivary glands from reduction by oxidative stress and prevents histopathological changes