البحث الخامس

Therapeutic effect of selenium and vitamin E on arsenic induced cardiac damage in adult male albino rat: Histological, biochemical and pharmacological study.

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Abstract:

Introduction: Arsenic is present naturally in drinking water, soil and air. Exposure to it via drinking water is associated with cardiomyopathy and ischemic heart disease, hypertension, peripheral vascular disease. Selenium and vitamin E co-administration markedlyimproves the deleterious effect of arsenic in rat myocardium. Both agents are natural antioxidants used to decrease tissue inflammatory reaction exerted by free oxygen radicals. Each drug could be used alone in treatment of sodium arsenate induced myocardial damage. However, combined administration of both drugs has a more potent anti-oxidant and antiapoptotic effect compared to using each drug alone. Aim of work: to elucidate the therapeutic role of selenium and vitamin E on sodium arsenate induced histological and biochemical alterations on rat myocardium. Material and methods: Fifty adult male albino rats were divided into five groups, weighing 180-220 g; Group I (Normal control): The rats were injected intraperitoneally once daily with 0.9% saline. Group II (Sodium arsenate administration for two weeks): Therats were injected intraperitoneally with 7.2mg/kg/day of sodium arsenate for two weeks. Group III (Sodium arsenate administration for six weeks): The rats were injected intraperitoneally with 7.2mg /kg/day of sodium arsenatefor six weeks. Group IV (Sodium arsenate for two weeks then selenium +vitamin E co-administration): The rats were injected intraperitoneally with 7.2mg/kg/day of sodium arsenate for two weeksfollowed by co administration with both 10 µg / kg / day selenium, and 20 mg / kg / day vitamin E for another two weeks. Group V (Sodium arsenate for six weeks then selenium +vitamin E co-administration): The rats were injected intraperitoneally with 7.2mg/kg/dayof sodium arsenate for six weeks followed by co administration with both 10 µg / kg / day selenium, and 20 mg / kg / day vitamin E

for another two weeks. The heart was excised and processed for the following studies: Light microscopic study with hematoxylin and eosin (H & E) and Masson's trichrome stains, electron microscopic examination and biochemical estimation of antioxidant enzymes. Results: Examination of specimens of the groups treated with sodium arsenate revealed disturbed myocardial architecture, nuclear and cytoplasmic degeneration, myocardial fibrosis and marked reduction of tissue levels of antioxidant enzymes. However, selenium –vitamin E co-administration markedly ameliorated these histological and biochemical alterations. Conclusion: It could be concluded that selenium and vitamin E had a beneficial role in treatment of cardiomyopathy caused by sodium arsenate administration in adult male albino rats.