

EFFECT OF ENVIRONMENTAL POLLUTION AND ITS RELATIONSHIP ON OXIDATIVE STRESS IN PATIENTS WITH CARDIOVASCULAR DISEASES

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Introduction: Recent studies have shown consistent evidence on the effects of air pollution on morbidity and mortality in respiratory and cardiovascular diseases. In Brazil, the technological and economic development driven by increased industrial park, growth in light and heavy fleet and expansion of the frontier production, brought new challenges to determine the impacts of pollution on human health. The benzopyrene (BaP) is considered one of the most potent carcinogens in animals, also embryotoxic and teratogenic. Recent studies have shown that exposure to BaP could causes increased progression of atherosclerosis, which is characterized by increased inflammatory cells and atherosclerotic plaques, important complicating factors in cardiovascular diseases. It is known that pathophysiological processes such as aging, the development of cardiovascular and neurodegenerative diseases have been correlated with oxidative damage in biomolecules, resulting in oxidative stress. Many xenobiotics which humans are exposed to environmentally and / or occupationally generate intracellular reactive species, especially reactive oxygen species (ROS), favoring damage to biomolecules, as in lipids, in proteins and DNA. Moreover, they may induce atherogenesis, mutagenesis and carcinogenesis.

Objective: Evaluate there are significant correlation between patients attended at the Institute of Cardiology of Rio Grande do Sul with severe cardiac arrhythmias (SCA) and / or acute myocardial infarction (AMI), biomarkers of exposure to environmental pollutants and their possible interrelationship with oxidative damage.

Materials and Methods: This research will involve about 100 patients with SCA and AMI, that will be diagnosed through electrocardiography and cardiac enzyme performed at the Institute of Cardiology, which will respond to an additional questionnaire to obtain data referent to habits of life of patients and possible influence of environmental pollutants in the context of the presented pathology. The biomarker of exposure to benzopyrene will be determined through its urinary metabolite by HPLC with fluorescence detection. Urinary cotinine is a biomarker of exposure to tobacco and will be determined by HPLC-UV. The biomarkers of oxidative stress will be determined through blood levels of Malondialdehyde (MDA) which are analyzed by the method of Grotto *et al.* 2007, the levels of protein carbonyls (PCO) by the method of Levine *et al.* 1990, the levels of reduced glutathione (GSH) will be determined by the method of Garcia *et al.*, 2007. The comet assay will be performed to evaluate DNA damage, according to the method of Silva *et al.* 2004. Statistical analysis will be carried out using SPSS 10.0 and / or *Statistic 6.0*. The correlations will be investigated by Pearson or Spearman correlation, according to the distribution of study variables.

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References:

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