SEXUAL DIMORPHISM IN REDOX HOMEOSTASIS IN THE LIVER OF WISTAR RATS

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Introduction and objectives: Non-alcoholic fatty liver disease (NAFLD) represents a spectrum of conditions caused by an excess of fatty accumulation in the liver that affect up to 30% of the population in western countries, especially women. If untreated, this disease may progress to non-alcoholic steatohepatitis, fibrosis, cirrhosis and/or hepatocellular cancer. Furthermore, the reactive oxygen species (ROS), which are responsible for many cellular signaling events and cellular oxidative damage, have also a known role in various pathophysiological processes, including the development of NAFLD. However, there is a lack of scientific evidences defining the role of NOX between genders in NAFLD. Thus, the aim of this study was to evaluate the sexual dimorphism in redox homeostasis in the liver of Wistar rats.

Materials and methods: Males and females Wistar rats were euthanized at 4 months age. NADPH Oxidase (NOX) activity was performed by Amplex Red/HRP method. The antioxidants enzymes activity, catalase and glutathione peroxidase, and the thiol content were measured by spectrophotometry. The mRNA expression of NOX enzymes was evaluated by qPCR.

Results: Our data indicated that males present higher NOX activity, NOX4 expression and catalase activity. In addition, males have lower glutathione peroxidase activity. Finally, thiol content was not different between the analyzed groups.

Conclusion: Males generate more ROS than female, but at the same time have higher catalase activity. Since thiol content, a biomarker of oxidative stress, was not different between groups, we postulated that the higher NOX activity was counteracted by the higher antioxidant activity in male rats.

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Key Words: Sexual dimorphism, reactive oxygen species, non-alcoholic fatty liver disease