

ABSTRACT

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Obesity is currently one of the most widespread chronic diseases in the world. Many scientific teams are trying to clarify the causes of this disease and also examine changes in the body that may be related to this disease. The aim of this study was to determine the activity and expression of the enzymes superoxide dismutase (SOD) and catalase (CAT) and to assess activity of peroxidase (Px) in liver cytosol of experimental NMRI mice with obesity induced by monosodium glutamate (MSG) and healthy controls. Activities and expressions of selected enzymes were compared with respect to the pathological conditions (MSG mice, osmolality controls and unaffected mice), age (8 weeks x 20 weeks) and sex of the experimental mice. Activities were determined using spectrophotometric methods and polyacrylamide gel electrophoresis followed by immunoblotting was employed to monitor protein expressions. Differences in specific activities of SOD and CAT among the groups were only small. The most significant changes related to the induction of obesity were observed in activity of Px. MSG mice of both sexes and ages had a higher activity of Px than unaffected mice, specifically the difference was one third in the case of 8-week-old females and one quarter for males of the same age. Relative expression of SOD and CAT significantly decreased with age in the groups of MSG mice and osmolality controls, while it remained the same in unaffected mice. Comparison of results among individual groups of mice allowed to evaluate the effect of the pathological condition, age and sex of experimental animals on activity and expression of antioxidant enzymes.