Methionine and/or Methionine Sulfoxide Alter Parameters of Oxidative Stress in Liver of Rats

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High methionine (Met) levels and its metabolites have been related in several genetic abnormalities, such as methionine adenosyltransferase activity deficiency. Hypermethioninemic patients can present a variable degree of neurological dysfunction and hepatic alterations, whose underlying mechanisms are not completely established. In the present study we investigated whether oxidative stress is elicited by Met and/or methionine sulfoxide (MetO) in liver homogenates of 29-day-old Wistar rats. The in vitro effect of different concentrations of Met (0.02-2 mM), MetO (5-500 µM), as well as Mixture (Mix) (1 mM Met + 500 µM MetO) was studied on the following oxidative stress parameters: thiobarbituric acid reactive substances (TBARS), total thiol content, catalase (CAT) and superoxide dismutase (SOD) activities. Results showed that Met 1 and 2mM, and Mix significantly increased CAT activity. The activity of SOD was enhanced by Met 1 and 2 mM, MetO 500 µM and Mix. In contrast, TBARS levels and thiol content were not altered by Met, MetO and association of these compounds. Our findings clearly show that Met and/or MetO impair enzymatic antioxidant defenses in liver of young rats. It is presumed that these data might be associated, at least in part, with the hepatic damage observed in hypermethioninemic patients.

Key words: Methionine, Methionine sulfoxide, Oxidative stress, Liver, Rats

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