

# Abstract

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## Effects of long-term dietary intake of magnesium on oxidative stress, apoptosis and ageing in rat liver.

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**OBJECTIVE:** In the present study, we investigated the effect of long-term dietary Mg intake on the rate of oxidative stress, apoptosis and ageing in rat livers.

**METHODS:** To address this issue, rats were fed diets containing either a moderately deficient (0.15 g Mg/kg diet), a standard (0.8 g Mg/kg diet) or a high (3.2 g Mg/kg diet) Mg dose for two years.

**RESULTS:** It is noteworthy that a higher percentage of animal mortality was observed in the lowest Mg diet, as compared to the other groups. Oxidative stress and antioxidant status were evaluated by measuring different enzyme activities, among which glutathione peroxidase activity was significantly reduced when Mg content was decreased in the diet. Moreover, we obtained an activation of caspase-3 and a higher lipid peroxidation in the Mg-deficient group, as compared to the Mg standard group, while no changes in Mg-supplemented group were observed, in accordance with our previously published data in primary cultures of rat hepatocytes (Martin et al., J Nutr 2003). Telomere shortening was measured in rat livers, as a marker of ageing. We found that telomere length was decreased in old animals, as compared to young animals confirming that telomere shortening correlated well with ageing events. Moreover, in old animals, we obtained a decrease of telomere length in the Mg-deficient group, as compared to the other groups.

**CONCLUSION:** Taken together, our results show that a long-term chronic Mg deficiency led to oxidative stress, apoptosis and an acceleration of ageing in rat livers.

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