

## DILTIAZEM PREVENTS MONOSODIUM GLUTAMATE TOXICITY IN THE RAT TESTES

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Increased exposure to food additives may exhibit harmful effect on the male reproductive system. Neonatal application of high doses of popular taste enhancer monosodium glutamate (MSG) to different kinds of animals cause lesions of the hypothalamic nuclei and the retina. Later in adulthood, animals exhibit a series of neuroendocrine disorders (stunted growth, obesity and decreased fertility).

The mechanism of MSG action is not completely explained yet. We hypothesized that high concentration of MSG could alter permeability of neural membrane for calcium. The objective of our study was to find out whether the pretreatment with diltiazem, a calcium channel blocker, could prevent harmful effect of MSG in the rat testes. Male rat pups were treated with: 0.9% sodium chloride (C group), 4 mg/g BW of MSG (M group), 5 mg/g BW of diltiazem (D group) and diltiazem 5 mg/g BW with MSG (DM group) on 2<sup>nd</sup>, 4<sup>th</sup>, 6<sup>th</sup>, 8<sup>th</sup>, 10<sup>th</sup> postnatal day. Animals were sacrificed at the age of six months. MSG treatment resulted in: stunted growth (decreased naso-anal length and tail length;  $p < 0.05$ ), decreased relative testis weight ( $p < 0.05$ ), and increased adipose tissue mass (Lee index;  $p < 0.05$ ), testicular atrophy and decreased histomorphometric parameters (tubular area, tubular perimeter, Feret diameter, tubular diameter, epithelial height;  $p < 0.001$ ). The rats of C, D and DM groups had normal testicular histology and morphometric parameters. Pretreatment with diltiazem has prevented the development of morphological disorders of testes. Our results suggest that calcium overloading may play an important role among mechanisms of MSG testicular toxicity.

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**Key words:** *monosodium glutamate, diltiazem, morphometric parameters, testes, toxicity*