A MORPHOMETRIC STUDY OF THE TERATOGENIC EFFECT OF MONOSODIUM GLUTAMATE ON THE DEVELOPING CEREBRAL CORTEX OF WISTAR RATS (RATTUS NOVERGICUS)

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ABSTRACT
Effects of a flavor enhancer, monosodium glutamate (MSG) were evaluated in female albino rats during the gestational period. The aim of the present study was to investigate the morphometric and morphologic effect of prenatal administration of monosodium glutamate on the developing cerebrum of Wistar rats offsprings. Thirty two (32) virgin female Wistar rats weighing between 200g and 230g were used for this study. The animals were divided into 4 groups of 8 rats each. Each group was kept in a separate plastic cage. The rats were fed with commercial rat feed and tap water ad libitum throughout the experimental period. Oral doses of 6g/kg, 8/kg and 10g/kg body weight of MSG were administered to pregnant rats in 3 of the groups respectively from the 7th to the 15th day of gestation. The first group of rats was used as the normal control which received distilled water ad libitum for the same number of days. The fetal weight, fetal crown rump length, fetal head weight, brain weight, cerebral weight, cerebral width (narrow area) and cerebral width (broad area) of the developing cerebral cortex showed that in the group that received 10 g/kg, there was a significant (p<0.05) reduction in all the parameters when compared to the normal control. MSG also induced some abnormal changes in gestation such as tincture in the stomach of experimental (8g/kg) animals, increased mortality in group IV pups, macrocephaly as well as ulceration in the thoracic region among the group IV animals with a total death of 6 pups. It was concluded that monosodium glutamate exposure may cause severe intrauterine growth retardation; and may be neurotoxic to the developing cerebrum of Wistar rats.

Keywords: Developing cerebrum; Monosodium glutamate; morphometry; prenatal; Wistar rats.
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