

Original Paper

The protective role of folic acid on teratogenic effect of Carbamazepine in Balb/c mice

Afshar M (PhD)¹, Moallem SA (PhD)*², Baharara J (PhD)³, Takjoo T (MSc)⁴

¹Associate Professor, Department of Anatomy, Birjand University of Medical Sciences, Birjand, Iran.

²Associate Professor, Pharmaceutical Research Center, Medical Toxicology Research Center, Department of Pharmacodynamics & Toxicology, School of Pharmacy, Mashhad University of Medical Sciences, Mashhad,

Iran. ³Assistant Professor, Department of Biology, Mashhad Azad University, Mashhad, Iran.

⁴Developmental Biologist, Department of Biology, Mashhad Azad University, Mashhad, Iran.

Abstract

Background and Objective: Carbamazepine (CBZ) is an antiepileptic drug that causes significant malformations such as neural tube defects (NTDs), cardiac, skeletal and craniofacial defects if it is consumed during pregnancy. The aim of this study was to evaluate the protective effect of folic acid on prevention of birth defect due to Carbamazepine in Balb/c mice.

Materials and Methods: In this experimental study, Sixty Balb/c timed-pregnant mice were divided into 4 experimental and 2 control groups. Two experimental groups received daily intraperitoneal injections of 30 mg/kg (group I) and 60 mg/kg/body weight (group II) of CBZ on gestational days (GD) 6 to 15. Two other experimental groups (group III and IV) received similar doses of CBZ with folic acid supplement (3 mg/kg/day) by gavage route for 10 days before pregnancy and 15 days after GD0 (gestational day 0). Two control groups received normal saline or Tween 20 (polysorbate 20). Dams underwent cesarean section on GD18 and embryos were collected. External examination was done and data concerning malformations, weight and crown-rump of fetuses were collected and analyzed by using SPSS-11.5 software and ANOVA and chi-square tests.

Results: The mean weight and crown-rump of the fetuses in both experimental groups I and II were significantly reduced. Also in both experimental groups I and II various malformations were detected such as open eyes, limb defects, scoliosis, facial deformity and NTDs. The mean weight and crown-rump of fetuses in the folic acid treated groups did not show any meaningful differences in comparison with fetuses in experimental groups I and II. Also, meaningful reductions in eye, vertebral, limb and facial defects were seen in fetuses of group III. In experimental group IV, reduction of vertebral and limb defects were observed.

Conclusion: This study showed that consumption of folic acid (3 mg/kg/body weight) before and during pregnancy can reduce birth defects due to CBZ in Balb/c mice fetus.

Keywords: Carbamazepine, Birth defects, Folic acid, Mice

* Corresponding Author: Moallem SA (PhD), E-mail: moallem@mums.ac.ir

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