

Effects of folic acid on prevention of developmental malformations due to chronic consumption of acetaminophen in mice

Abstract

Background&Objective: Acetaminophen is a drug that is used commonly in the all time of pregnancy as a antipyretic and analgesic. The aim of this study was to determine teratogenic effects of this drug when it is used continuously before and during pregnancy.

Materials&Methods: 210 virgin female Balb/c mice in a standard animal house condition were assigned in to three experimental groups and three period of time (30 mice in the each of I and II experimental groups and 60 in III experimental group):

The first experimental group subdivided in to three I10, I20, I30 subgroups that received acetaminophen once daily at dose 40mg/kg/day by gavage in 10, 20 and 30 days prior to gestation and early 10 days of pregnancy, respectively. The second experimental group divided like the previous group (II10, II20, II30) but received 40 mg/kg/day of this drug twice daily (80 mg/kg/day). The third experimental group (III10, III20, III30) received 80 mg/kg/day of acetaminophen with and without 0.14 mg/kg/day of folic acid. Mice in Control groups, received normal saline and base of drug respectively. After using standard coupling method (three female mice with one male and determination of Gestational day 0) in GD18 the dams were sacrificed and the fetuses were removed. Macroscopic observation was done by stereomicroscope. ANOVA and TUKEY tests were used by the help of 10 version of SPSS software.

Results: Long consumption of acetaminophen in doses of 40 and 80 mg/kg/day in the 20 and 30 days before pregnancy and 10 days after pregnancy can induce shortened and asymmetrical limbs and hand aplasia. In addition, ekymosis and fetal resorption were seen. 16.1%, 6.5% and 14% of fetuses were malformed in the I30, II20 and II30 groups, respectively. Also, 11.3%, 4.9% and 12.4% of fetuses in these same groups had limb defects. In the III20 and III30 groups that fetuses used folic acid and drug at the same time, rate of malformations reduced to 1.6% ($P<0.05$).

Conclusion: It is recommended pregnant women not to take acetaminophen atleast a month before pregnancy and in case of taking this drug the folic acid to be accompanied.

Key Words: Acetaminophen- Pregnancy- Teratogenic effects- Folic acid

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