

Teratogenic Effect of Bisphenol A in Development of Balb/C Mouse

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Abstract : Bisphenol A (BPA) is a monomer used in the manufacture of polycarbonate plastics. Due to having properties such as transparency, heat and impact resistance, it is used widely in medicine, sorts, electronic components, and food containers. It is also used in the production of resins which is applied for lining cans. BPA releases from resins and polycarbonate when it is heated or continuously used the containers from which BPA can enter the body. There are several reports indicating the presence of BPA in the placenta, amniotic fluid, and the embryo itself. While researchers investigated the teratogenic effect of BPA on embryos, very limited work has been done on the effects of BPA when applied from early stages of development. In this study, The teratogenic effect of BPA was investigated at earliest preimplantation (day zero) through day 15.5 of the development of Balb/C mouse embryos. After ensuring the pregnancy via observing vaginal plug, Pregnant mice were divided into five groups. For the three experimental groups, the amount of 500, 750, and 1000 mg/kg/d Bisphenol A was given orally according to body weight. The sham group that was treated with sesame oil, which was used as vehicle and control group remained intact. On day 18.5 of gestation, embryos were removed from the uterus. Randomly half of the embryo were fixed in Bouin for tissue analysis. The other half were prepared for skeletal system staining using Alizarin Red and alcian blue dyes. The results showed that the embryonic weight and the crown-rump length of embryos decreased significantly ($P < 0.05$) in all experimental groups compared to the control group and the sham. In this study, skeletal abnormalities such as delay in ossification of skull and limbs as well as the deviation in the backbone were seen. This research suggests that pregnant mothers need to be aware of possible teratogenic effects of BPA at any stage of pregnancy especially from early to mid stages. In this case, pregnant mothers may need to stop using any manufacture of polycarbonate plastics, as a container for food or drinking.

Keywords : bisphenol A, development, polycarbonate plastic, skeletal system, teratogenicity

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