

LOW DOSE MIXTURE EFFECTS OF BISPHENOL A AND ISOBUTYLPARABEN FOR THE MALE REPRODUCTIVE SYSTEM

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Background and Aims: Exposure to individual estrogenic endocrine disruptors at relatively high doses could induce male reproductive abnormality. Recently, the concerns were increased on how estrogenic endocrine disruptors can generate reproductive adverse effects in a mixture at a concentration that does not individually induce observable effects. This study was performed to determine the effect of mixture exposure on male reproductivity at low level of bisphenol A (BPA) and isobutylparaben (IBP).

Methods: Corn oil, BPA (0.05 mg/kg/day), IBP (2.5 mg/kg/day) and mixture (BPA 0.05 mg/kg/day and IBP 2.5 mg/kg/day) were administered once daily by oral gavage to dam from gestation day 6 to lactation day 21 for 8 weeks to pregnant Sprague-Dawley rats. After lactation, treatment groups were divided into three vehicles - BPA, IBP and mixture treated groups. Male pups were sacrificed by isophorone at postnatal day 70. Male pups were examined for developmental characteristics, body and organ weight (testis, epididymis and prostate), serum sex hormones, thyroid hormones, sperm toxicity, and histological change of testis and epididymis.

Results: The IBP-treated group showed decreased estradiol levels in the early life stage. Life long period exposed groups showed increased body weight and decreased testosterone levels in IBP- and mixture-treated groups; increased relative epididymis weight in BPA-treated group compared to control; and decreased testosterone and triiodothyronine levels in the mixture-treated group. Epididymal sperm count and motility was significantly decreased in all treated groups. The histological findings using hematoxylin and eosin stain of the testis and epididymis did not change between control and treatment groups.

Conclusions: Early life exposure to low dose BPA and IBP in male rats showed adverse synergistic effects to the male reproductive system in adulthood.