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研究论文

# 妊娠期和哺乳期双酚A暴露对幼年子代小鼠焦虑和抑郁行为的影响

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**摘要:**

双酚A(bisphenol-A,BPA)对脑和行为发育的低剂量效应已引起广泛关注。本研究分别于妊娠最后2周和分娩后前2周母鼠灌胃BPA(0.4和4 mg/kg·d),然后以旷场、高架十字迷宫、明暗箱、镜子迷宫、强迫游泳和被动回避箱等模型,分别测试幼年期(生后21～28 d)子代小鼠的行为,探讨围生期不同阶段的BPA暴露对幼年仔鼠自发活动、探究、焦虑、抑郁和被动回避记忆等行为的影响。结果表明,围生期不同阶段的BPA暴露对这些行为的影响不同,主要表现为:妊娠期BPA暴露促进幼年仔鼠的活动性,减弱其焦虑状态,提高雄性仔鼠的探究能力,促进雌性仔鼠的被动回避记忆;哺乳期BPA暴露减少幼年仔鼠的活动性,但对其焦虑行为的影响相对较弱,不影响仔鼠的探究能力和被动回避记忆;而妊娠期和哺乳期BPA暴露均加剧幼年仔鼠的抑郁行为。以上结果提示,妊娠期和哺乳期BPA暴露均可影响幼年仔鼠的焦虑、抑郁、被动回避记忆等多种行为,而妊娠期可能是BPA影响的更敏感时期。

**关键词:** 双酚A 行为发育 焦虑 抑郁 被动回避记忆

## Gestational and Lactational Exposure to Bisphenol A Affects Anxiety- and Depression-Behaviors in Young Offspring Mice

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Abstract:

Bisphenol A (BPA) is an environmental estrogenic disrupter widely used in the production of plastics, and ubiquitous human exposure to this chemical has been proposed to be a potential risk to public health. There has been a growing concern about the effect of early-life exposure to low doses of BPA. This study was to investigate the behavior difference of mice which exposed to BPA in gestation period or lactation period separately. After acclimatization for one week, adult female ICR mice were placed with males (two females: one male) and vaginal smears were examined daily. A sperm-positive smear determined gestational day (GD) 1. Pregnant mice were divided into 2 groups randomly. One group was orally exposed to BPA dissolved in peanut oil (0.4 or 4 mg/kg·d) or only peanut oil as vehicle control from GD8 until offspring mice born. The other group was exposed to BPA with the same method from offspring mice born to postnatal day (PND) 14. At PND21 of age, open field, dark/light transition, mirror chamber, elevated plus-maze, forced swim and step-down were respectively used to test spontaneous activity, exploratory behavior, anxiety, depression, and passive avoidance memory in offspring mice. The results showed that gestational or lactational exposure to BPA differently affects behaviors in offspring mice. Gestational exposure to BPA weakened anxiety and increased spontaneous activity of young offspring, as well as enhanced exploratory behavior of male offspring and passive avoidance memory of female offspring. Lactational exposure to BPA decreased the spontaneous activity of young offspring, but no significant effect on anxiety was found in offspring mice. Both gestational and lactational exposure to BPA strengthened depression in male and female offspring mice. These results suggested that non-reproductive behaviors in offspring mice, such as anxiety, depression, passive avoidance memory, were affected by both gestational and lactational exposure to BPA, while the affection was more sensitive in pregnancy period.

Keywords: Bisphenol A Behavior development Anxiety Depression Passive avoidance memory

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