

## Maternal Exposure to Bisphenol A and Its Association with Birth Outcomes

**Authors :** Yi-Ting Chen, Yu-Fang Huang, Pei-Wei Wang, Hai-Wei Liang, Chun-Hao Lai, Mei-Lien Chen

**Abstract :** Background: Bisphenol A (BPA) is commonly used in consumer products, such as inner coatings of cans and polycarbonated bottles. BPA is considered to be an endocrine disrupting substance (EDs) that affects normal human hormones and may cause adverse effects on human health. Pregnant women and fetuses are susceptible groups of endocrine disrupting substances. Prenatal exposure to BPA has been shown to affect the fetus through the placenta. Therefore, it is important to evaluate the potential health risk of fetal exposure to BPA during pregnancy. The aims of this study were (1) to determine the urinary concentration of BPA in pregnant women, and (2) to investigate the association between BPA exposure during pregnancy and birth outcomes. Methods: This study recruited 117 pregnant women and their fetuses from 2012 to 2014 from the Taiwan Maternal- Infant Cohort Study (TMICS). Maternal urine samples were collected in the third trimester and questionnaires were used to collect socio-demographic characteristics, eating habits and medical conditions of the participants. Information about birth outcomes of the fetus was obtained from medical records. As for chemicals analysis, BPA concentrations in urine were determined by off-line solid-phase extraction-ultra-performance liquid chromatography coupled with a Q-ToF mass spectrometer. The urinary concentrations were adjusted with creatinine. The association between maternal concentrations of BPA and birth outcomes was estimated using the logistic regression model. Results: The detection rate of BPA is 99%; the concentration ranges ( $\mu\text{g/g}$ ) from 0.16 to 46.90. The mean (SD) BPA levels are 5.37(6.42)  $\mu\text{g/g}$  creatinine. The mean  $\pm$ SD of the body weight, body length, head circumference, chest circumference and gestational age at birth are 3105.18  $\pm$  339.53 g, 49.33  $\pm$  1.90 cm, 34.16  $\pm$  1.06 cm, 32.34  $\pm$  1.37 cm and 38.58  $\pm$  1.37 weeks, respectively. After stratifying the exposure levels into two groups by median, pregnant women in higher exposure group would have an increased risk of lower body weight (OR=0.57, 95%CI=0.271-1.193), smaller chest circumference (OR=0.70, 95%CI=0.335-1.47) and shorter gestational age at birth newborn (OR=0.46, 95%CI=0.191-1.114). However, there are no associations between BPA concentration and birth outcomes reach a significant level ( $p < 0.05$ ) in statistics. Conclusions: This study presents prenatal BPA profiles and infants in northern Taiwan. Women who have higher BPA concentrations tend to give birth to lower body weight, smaller chest circumference or shorter gestational age at birth newborn. More data will be included to verify the results. This report will also present the predictors of BPA concentrations for pregnant women.

**Keywords :** bisphenol A, birth outcomes, biomonitoring, prenatal exposure

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