

FETAL VOCS EXPOSURE AND INFANTILE NEUROBEHAVIORAL DEVELOPMENT IN MOTHERS AND CHILDREN'S ENVIRONMENTAL HEALTH (MOCEH) STUDY

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Background and Aims :Prenatal exposures to VOCs are treated as environmental toxicant which has health effect on fetus and their last of life. However, regarding to postnatal neurobehavioral development, limited studies were done and even failed to find a significant relationship between them. Therefore, we aimed to investigate the relationship between prenatal exposure to VOCs and postnatal neurobehavioral development of 6 and 12month.

Methods: 1,751 pregnant women were enrolled in birth cohort of MOthers and Children's Environmental Health(MOCEH) study from 2006 to 2010. We investigated maternal general characteristics including socio-economic and obstetric characteristics by questionnaires. Environmental hygienist assessed total volatile organic compound(TVOC) and formaldehyde(HCHO) exposure by using passive samplers for 382 pregnant women during pregnancy. After delivery, birth outcomes such as gestational age, birth weight and gender of newborns were obtained from delivery records. Certificated investigators performed baley test for measuring mental developmental index(MDI) and psychomotor developmental index(PDI) of infants on 6 and 12month. After excluding twins, undelivered cases and missing values for important covariates, we used 338 newborn's data and multiple general linear models in statistical analyses(SAS version 9.2).

Results: The median values of TVOC and HCHO were 183.8 and 69.5ug/m3. The mean of newborn's birth weight is 3289.3g and 7cases were low birth weight(2%). The mean of infantile MDI scores were 96.4 and 103.8 at 6 and 12month, and PDI were 96.2 and 96.6 at each point, respectively.

In adjusted model controlled covariates including breast-feeding and maternal education, a quartile increase of TVOC showed statistically significant decrease in MDI($\beta=-1.7$, SE:0.8. $p=0.05$) at 6 month, however, not statistically significant decrease in PDI score($\beta:-1.2$,SE=0.9).

Conclusions:These results indicated that elevated exposure to TVOC of fetal period may decrease postnatal neurobehavioral development during early life.

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