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PLACENTAL TRANSFER OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) AND RELATIONS WITH DEMOGRAPHIC AND PHYSIOLOGIC FACTORS: A PRELIMINARY STUDY IN A CHINESE BIRTH COHORT

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Per- and polyfluoroalkyl substances (PFASs) can cross the placental barrier. However, little is known about the predictors of placental transfer efficiency. We aimed to explore whether placental transfer efficiency (based on the ratio of cord to maternal sera concentrations) is affected by maternal demographic and physiologic factors. PFAS concentrations were analyzed in matched samples of maternal sera in all 3 trimesters and umbilical cord sera (N=100) from the prospective Healthy Baby Cohort (HBC), China in 2012-2014. Linear regression was used to estimate associations of transfer efficiencies with predictors. Aside from traditional PFASs, a novel PFAS named F-53B was detected for the first time in pregnant women and the fetus. Strongest correlations between cord PFAS levels and maternal levels were observed for maternal sera sampled in 3rd trimester followed by samples taken in 2nd and 1st trimester. Higher transfer efficiencies of PFASs were associated with older maternal age, higher educational attainment and lower glomerular filtration rate (GFR). Of interest, cord sera albumin was a positive predictor for higher transfer efficiency, whereas maternal serum albumin tended to reduce transfer efficiency. Our results suggested an ubiquitous exposure to F-53B in Chinese pregnant women and their fetus. PFAS levels in maternal serum sampled in 3 trimester gave better estimates of PFAS fetal exposure, as represented by cord serum levels. Physiological predictors for placental transfer of PFASs were observed for the first time in a Chinese birth cohort. GFR and serum albumin may play critical roles in the PFAS placental transfer.

Biography

Jia-yin Dai is a professor of ecotoxicology at the Institute of Zoology. He obtained a Ph.D in 1999 from Nanjing University, China, and carried out postdoctoral research work from 2001 to 2005 at the Weill Medical College of Cornell University, USA. He is the director of the Key Laboratory of Animal Ecology and Conservation Biology, and an editorial board member of Integrative Zoology. He has published more than 100 papers in reputed journals and is also the recipient of the NSFC "Distinguished Young Scholars" award and the CAS "One Hundred Talent Program" award.

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