

FETAL EXPOSURE TO POLYBROMINATED DIPHENYL ETHERS (PBDES) AND ATOPIC DERMATITIS IN INFANTS

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Background and Aims: Polybrominated diphenyl ether (PBDE) is one of the brominated flame retardants. Some of the PBDE congeners or isomers are reported to have high toxicity and endocrine disrupting effects. The health effects of PBDEs have been reported to be different among the congeners and isomers. Our previous studies revealed that Japanese fetuses were exposed to PBDEs. In Japan, the number of allergic disease patients is rapidly increasing among children. To find the reason of this rapid increase, an association between the occurrence of atopic dermatitis (AD) among the infants and the fetal exposure to PBDE congeners and isomers was examined.

Methods: One hundred and thirteen umbilical cords (UC) were collected in Chiba City (Japan) at deliveries. The concentrations of PBDE congeners and isomers in the 55 UC was measured by GC/MS. Medical doctor's diagnosis in follow-up study showed that 18 infants were AD and 37 infants were non-AD at 7-months old. This study was approved by the "Congress of Medical Bioethics" of Chiba University and all the samples were obtained after receipt of written informed consent.

Results: We found significant correlation between the occurrence of AD and the concentration of total PBDEs ($t < 0.05$), TriBDE ($t < 0.05$), TetraBDE ($t < 0.01$), PentaBDE ($t < 0.01$) and PentaBDE #99 ($t < 0.05$). Our findings indicate that there are strong or weak association between some congeners and isomers of PBDEs and the occurrence of AD in infants.

Conclusions: Our present data suggest the possibility that there is some association between fetal exposure to PBDEs and the occurrence of AD among infants. However, it is unclear if the association is due to combined effects of PBDEs and other chemicals or due to the fetal exposure or exposure through breast milk. We need further studies to clarify this association.