

ASSOCIATION BETWEEN PESTICIDES EXPOSURE AND ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

Mei-Lien Chen, *Institute of Environmental and Occupational Health Sciences, College of Medicine, National Yang-Ming University, Taipei, Taiwan*

I-Fang Mao, *Department of Occupational Safety and Health, Chung Shan Medical University, Taichung, Taiwan*

Chun-Cheng Feng, *Institute of Environmental and Occupational Health Sciences, College of Medicine, National Yang-Ming University, Taipei, Taiwan*

Chung-Kai Wu, *Institute of Environmental and Occupational Health Sciences, College of Medicine, National Yang-Ming University, Taipei, Taiwan*

Ying-Sheue Chen, *Division of Child and Adolescent Psychiatry, Department of Psychiatry, Taipei Veterans General Hospital, Taipei, Taiwan*

Background and Aims: Pesticides are used intensively in Taiwan. Residual pesticides in fruits and vegetables are commonly reported. The risk of fetus and young children exposed to pesticides is with great concern. The objectives of the study are to establish the baseline data of exposure for young children and to explore the association between pesticides exposure and attention-deficit/ hyperactivity disorder (ADHD).

Methods: There were 153 pre-school normal children (control group) and 67 doctor-diagnosed ADHD children (case group) recruited in this study. Their urine samples were collected and structured questionnaires were completed by the parents. We analyzed the parent pesticides included organochlorines, carbamates, pyrethrins, and organophosphates and the metabolites of organophosphates - six kinds of dialkyl phosphates (DAP). After pretreatment of samples, the specimens were analyzed by using GC/mass spectrometry.

Results: The detectable pesticides included diazinon, transfluthrin, chlorpyrifos, p,p'-DDT, bioallethrin, and pretilachlor. Among them, transfluthrin and bioallethrin were the highest in terms of both detection rate and mean concentration. DDT was the least detected one. More than 25% of urine samples were detected more than two kinds of pesticides. We found one of the DAP metabolites was detected in 98% of samples, and diethylthiophosphate and dimethylphosphate had the highest detection rates (64% and 62%, respectively). Children with higher urinary dialkylphosphate concentrations, especially diethylphosphate, diethyldithiophosphate and dimethyl alkylphosphate concentrations, were more likely to be diagnosed as having ADHD; the OR were 2.587, 8.014 and 2.372, after adjusting for confounding factors during pregnancy.

Conclusions: Our results suggest that Taipei children were commonly exposed to pesticides and the association between organophosphate pesticides and ADHD was statistically significant.