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May neonicotinoid insecticide cause neurodevelopmental disorder by environmental exposure?

Kumiko Taira

Tokyo Women's Medical University Medical Center East, Japan

In 2004, we started to study the health effect of neonicotinoid insecticide (neonic), because we encountered many patients with unusual symptoms including chest pain with ECG abnormality after a neonic spraying application. Neonics were water systemic pesticide introduced to global market in 1990's as alternatives of organophosphate insecticide. In 2006, neonic spraying application was discontinued, whereas we met a large-scale pandemic of patients with similar symptoms. All of them had become ill after consecutive intake of tea beverages and/or conventional domestic fruits. We started chemical analysis of patients' urine from 2007, and detected some neonicotinoid metabolites in their urine. Then we conducted a prevalence case control study prospectively, and analyzed urinary neonics and a metabolite, N-desmethyl-acetamiprid (DMAP). DMAP and thiamethoxam were more detected significantly from the group of patients with typical symptom named neo-nicotinic symptoms including 6 subjective symptoms, i.e. headache, general fatigue, chest pain or palpitation, stomachache, muscle pain or weakness or spam and cough, and 3 objective symptoms, i.e. postural tremor, recent memory loss, and fever. Last year, a small-scale epidemiological study in Japan revealed that the detection rate of neonics were increasing linearly in these 20 years, although the domestic shipment has not changed in imidacloprid, acetamiprid, and nitenpyram. Laboratory data shows human excretion half life in urine is approximately one and half day for DMAP and imidacloprid. Animal data shows neonics accumulate in brain, affect on developing neuron, and cause neurodevelopmental disorders. Acceptable dose of intake of neonics seems to be not low enough, if those data were applied.

Biography

Kumiko Taira received her Medical degree from Kobe University in 1982. Since 2001, she has been involved in studying the effects of environmental exposure of organophosphates and neonicotinoids on the human health in collaboration with Dr. Yoshiko Aoyama in Gunma, and published eleven academic articles. She is a part-time Lecturer at the Department of Anesthesiology at Tokyo Women's Medical University Medical Center East, a part-time Lecturer at the Department of Environmental Education at Tokyo Kasei University, a Board Member of the Japanese Society of Clinical Ecology, and the Chair of the Public Health working group of IUCN Task Force on Systemic Pesticides.

VFG03077@nifty.com

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