

Dietary Exposure to Pesticides in Tannia in Pregnant Surinamese Women

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Background

Suriname's (8.8 kg active ingredient/ha) neurotoxic pesticides use is among the highest Caribbean-wide. The Caribbean Consortium for Research in Environmental and Occupational Health is assessing exposure to selected pesticides in 1000 vulnerable mother/child dyads. Environmental assessments showed residues of prohibited endosulfan and lindane in tannia (*Xanthosoma brasiliense*). This study assessed dietary exposure to these pesticides in tannia.

Methods

An interviewer-assisted survey in 696 participants assessed body weight (BW), consumption and intake rates (IRs) of produce. A preliminary deterministic non-cancer risk assessment and a sensitivity analysis were conducted using USEPA's reference doses (RfDs) for endosulfan and lindane. Tannia consumption-associated risk was determined using the hazard quotient (HQ).

Results

Tannia was the most frequently consumed leafy vegetable (89%); mean IR 0.028 kg/day (range: 0.001-0.531 kg/day). Mean BW: 72 kg (range: 34-138 kg). Average case scenario: Tannia critical IRs > actual IRs (7.8 kg/day for endosulfan, 0.9 kg/day for lindane), HQ < 1 and the levels of concern (LoCs) were 221x > for endosulfan and 26x > for lindane compared to detected pesticide residue levels. Worst case scenario (lowest BW, highest IR and highest pesticide residue level) for lindane: Tannia critical IR (0.3 kg/day) ~ actual IR; HQ > 1; LoC < highest detected pesticide residue level.

Discussion

Dietary exposure to endosulfan in tannia does not seem to pose a risk for adverse health effects, but exposure to lindane in tannia in the worst-case scenario potentially does. Since the current RfDs for endosulfan and lindane are based on non-neurotoxic endpoints, the risk assessment findings must be interpreted cautiously.

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