Pesticide exposure and associated acute health effects among smallholder farmers in Mbale District, Eastern Uganda

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Pesticide use for agriculture is on the rise in Uganda. Many farmers improperly use pesticides, which puts them at risk of exposure and adverse health effects. We assessed pesticide exposure levels and acute health effects among smallholder farmers in Mbale district, Uganda. We conducted a cross-sectional study, throughout August 2020, among 576 randomly selected farmers. Data was collected using an interviewer administered structured questionnaire. We estimated pesticide exposure scores based on six self-reported determinants: use of personal protective equipment, application, mixing, duration of spraying, bathing and changing clothes after applying pesticides. Farmers with a monthly cumulative pesticide exposure score greater than 22.5 were categorized as high. We conducted descriptive analysis to generate frequencies and also estimated multivariable modified Poisson regression model to determine factors associated with high pesticide exposure using prevalence ratios (PR) as the measure of association. Four-hundred nine (71 %) of 576 farmers were using pesticides, with 70% being males. Overall, 176(43.0%) of the 409 farmers had experienced high exposure to pesticides. Majority, 331(80.9%) of the 409 farmers had experienced at least one acute health effect with skin irritation (60.5%), headache (31%), nausea (24.7%) and dizziness (27.4%) being the most reported. The proportion of farmers that experienced high pesticide exposure levels was two times higher among males (adj.PR) 2.19; 95%CI: 1.49, 3.20) than females. Farmers that used a mixture of pesticides (adj.PR:1.47; 95%CI:1.03, 2.10) were more likely to experience high levels of pesticide exposure. Wearing rubber boots while handling pesticides was protective of high pesticide exposure levels (adj.PR:0.49; 95%CI: 0.34,0.71). Exposure to pesticides was high especially among male farmers and those that used a mixture of pesticides. Acute health effects among farmers due to pesticide exposure were also common. There is urgent need for strategies to promote safe pesticide handling practices among farmers in order to reduce exposure and associated health effects.

Key words:  Pesticides, Exposure, Smallholder farmers, Acute health effects, Uganda