P27-10
Dermal exposure to the fungicide tebuconazole during application in vineyards

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Purpose: Tebuconazole (TEB) is a fungicide increasingly employed to counter moulds on grapevine. The aim of the study was to assess operator exposure during application by different methods.

Methods: Five vineyard workers (males, aged 30–55 years) entered the study. Nine working days ($n = 2$ for one day, $n = 2$ for two days and $n = 1$ for three days) were monitored. Farmers mixed and loaded a commercial mixture containing tebuconazole and sprayed on vineyards, either mechanically or manually. The sprayed surface was of 1.5–17 ha per day, depending on land steepness. The amount of pesticide applied was 70–1500 g of TEB, according to estate surface. A whole-body method was used that included analysis of coverall, of underwear, of head cover (end of each application day) and of hand wash (end of mixing and loading). Measurements were performed by LC–MS-MS with deuterated tebuconazole as internal standard.

Results and conclusions: Contamination of the coverall of the operators ranged $1.5–35 \times 10^{-3}$ g, corresponding to 5–400 nanograms per square decimeter, with higher contamination in the lower half of the body and on the forearms, depending on the amount used and on the method of application (manual spraying > open tractor > cockpit tractor). Contamination of the underwear ranged $50–450 \times 10^{-6}$ g, corresponding to 0.1–6 nanograms per square decimeter and indicating a permeation rate <10%. Hand washing yielded from 50 to 2000×10^{-6} g. Large differences were observed according to the application method and exposure determinants can be identified. Acknowledgments: The study was funded by ACROPOLIS project within the EU 7th Framework Program (proposal number 245163).

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P27-11
Contribution of diet to the aggregate exposure to tebuconazole in vineyards

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Purpose: Tebuconazole (TEB) is a fungicide increasingly employed to counter moulds on, among others, grapevine. The aim of this pilot study was (a) to set up a standardized and affordable protocol to document the food intake in the application period, (b) to evaluate potential contribution of different dietary categories to the exposure to tebuconazole in applicators.

Methods: five volunteers were followed by a dietician and asked to prepare duplicate portions of all meals consumed during the day before and the day of tebuconazole application. Duplicated portions were subsequently divided into four distinct categories (vegetable and fruits, cereal containing products, all the other foods, liquids) using sealable, clean, polyethylene containers. Samples were homogenized and stored for analysis of contaminants. Volunteers received written instruction on how to record information on gathered foods, weighing procedure and collection of food samples.

Results: Participants did not eat breakfast cereals and soy products. Conversely, bread (100%), milk and dairy products, and coffee and other stimulants (80%) were consumed every day. Home was the preferred place of consumption, but in some cases workers ate in the field during the application (7% of the recorded items). The 38% of recorded solid foods was constituted by composite food. Mineral water was the main liquid with daily occurrence of wine.

Conclusions: Data analyses of contaminants will help to improve the protocol for duplicate collections and to define eventual at risk food categories.

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P27-12
Demographics and risk of OP pesticide exposure in pregnancy and neonates in Sri Lanka

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Adverse health effects from organophosphorus pesticide (OP) exposure are a growing concern, particularly in the developing world where usage is high and unregulated. There is particular concern regarding exposure in pregnancy and risk to the developing fetus. The purpose of this analysis was to identify and assess risk of rural and urban pregnant Sri Lankan women and their infants to environmental exposure from OP's. We have also collected biological samples to assess exposure.

Methods: We recruited women in 3rd trimester pregnancy ($n = 248$) from antenatal clinics in 2 Sri Lankan centers. A full pregnancy history was recorded and questionnaire completed. Women were followed through to term and infant birth measurements recorded. Maternal blood, cord blood, urine and breast milk samples were collected from 1 to 4 occasions for future analysis.

Results: Women ($n = 248$) were of median age 24 (range: 16–34)yrs. 100(40%) of all women lived on or within 10 m of a farm and 74% of these reported current OP use. 47% of farming women used high risk (well) water as a primary source. Only 14% of women believed pesticides could be harmful to health. Median infant weight was 2.93(1.43–3.9)kg, and head circumference 33.8(27–53)cm, lower than WHO average figures for South Asia. Abnormal APGAR score was noted in 40% of births at 5 min.

There is a potential hazard for this population considering the high rate of OP pesticide use, close living proximity to a farm and well water as a primary supply. Investigation into plasma OP levels and toxicogenomics are ongoing to quantify exposure

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