

pesticides, but they are neither adopted nor adapted in Canada. Beside, most field studies reported in the literature, even if they are scarce, usually report protection factors above 90 % for protective clothing. It is not necessarily consistent with chemical resistance measured in the lab. This raises the question of homogeneity, representativeness, and comparability of data, and calls for a collaborative action to gather the multiple skills and knowledge necessary to address those issues.

5481 - Work context and practices related to the use of pesticides and protective equipment among Québec apple growers: a qualitative investigation

Danièle Champoux², Caroline Jolly² and Ludovic Tuduri¹

¹*Substances chimiques et agents biologiques, Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST);*

²*Prévention durable et environnement de travail, Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST)*

Introduction: The objective of a qualitative multidisciplinary research project linking occupational exposure to pesticides and OHS in apple production was to document work context and practices as well as exposure factors. **Methods:** Semi-directed interviews and observation of work practices were carried out with 15 voluntary apple producers in the two main apple production areas of Québec in 2013 and 2014. Taped interviews gathered information on apple growers and their farms, pesticides used and work practices, personal protective equipment (PPE), information, risk perception and health. Videoed observations focused on pesticides mixing and spraying as well as cleaning of equipment and containers. Data analysis with NVivo and ergonomics work analysis were used. **Results:** The overview of apple production from the perspective of the producers includes reference to the environmental and economic context; producers associate the rapid changes to traditional practices, the stress of ensuring the livelihood of families and the survival of small farms, with the intense pressure to use pesticides in order to get the highest price for the fruit. The choice and use of pesticides is described as increasingly complex, requiring both scientific and practical knowledge, for which insufficient resources are available. Results based on observation and analysis of typical work situations reveal exposure linked to site layout and characteristics of both production and protective equipment, such as cabs for instance. Situations illustrating absence of adequate information on health and safety in relation to choice of products, work methods and PPE, and compromise between health and production concerns, are described. **Discussion** Qualitative data permit the contextualisation and understanding of apple growers' practices and pesticide exposure. An exploration of significant issues and avenues for improvement will lead to recommendations regarding alternative work practices, PPE design and use, as well as information. The qualitative data will also enrich the interpretation of a 2014 survey on pesticide use among all Quebec apple growers.

5549 - Exposures, Symptoms and Neurobehavioral Performance: A Longitudinal Study of Adolescent Pesticide Applicators

Diane Rohlman¹, Gaafar Abdel Rasoul², Ahmed Ismail², Matthew Bonner³, Olfat Hendy⁴, Khalid Khan¹ and James Olson³

¹*Occupational and Environmental Health, University of Iowa;* ²*Faculty of Medicine, Menoufia University;* ³*Department of Social and Preventative Medicine, State University of New York at Buffalo;* ⁴*Clinical Pathology and Hematology and Immunology, Menoufia University*

Chlorpyrifos (CPF), an organophosphorus pesticide, is applied to the cotton crop in Egypt by adolescent workers; however, the extent of occupational exposure and the potential for environmental CPF exposure in this population is not well understood. In addition, while there is evidence that repeated low-level OP exposures are associated with neurobehavioral performance deficits in adults, little is known about potential effects in adolescents, who have a developing nervous system. The goal of this project is to assess biomarkers of exposure and the impact of exposure on neurological symptoms and neurobehavioral performance among adolescents. Adolescent male pesticide applicators (N=57) and age-matched male non-applicators (n=38), recruited from Menoufia Governorate, Egypt, completed symptom questionnaires and neurobehavioral tests across a 10-month period prior to, during and after pesticide application in 2010. Spot urine samples were collected measure trichloro-2-pyridinol (TCPy) a CPF-specific metabolite (exposure biomarker) at multiple time points, and blood acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) provided biomarkers of effect. Significantly higher TCPy concentration and BChE depression were found in applicators compared to non-applicators throughout CPF application. This difference persisted for 4-7 weeks after the cessation of agricultural spraying. However, both groups exhibited significantly elevated TCPy and depressed BChE, compared to their respective baseline. Applicators reported significantly more neurological symptoms relative to baseline than non-applicators at time-points during and after the pesticide application season. Cumulative TCPy level was a significant predictor for the average percentage of neurological symptoms only among the applicators. Neurobehavioral performance showed initial learning effects and then deficits in performance for the pesticide applicators during the pesticide application season. The biomarkers provided robust measures of exposure and effect and revealed noteworthy exposures in both applicators and non-applicators. Biomarker levels in the non-applicators, which mirrored that of the applicators, indicated that the non-applicators received environmental CPF exposures. The number of symptoms reported by both the applicators and non-applicators follow the same pattern as the urinary TCPy levels. Larger, long-term studies are needed to more fully characterize the exposure and effects in adolescent applicators; furthermore, non-applicators appear to have environmental exposures that need to be addressed because of the potential public health concern.

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