Asia Pacific Environmental and Occupational Health Journal (ISSN 2462 -2214), Vol 10 (4): 11, 2024

Acephate Exposure and Blood Cholinesterase Depression of Oil Palm Plantation Workers in Malaysia

Ismaniza Ismail[1], Maisarah Nasution Waras[2], John W. Edwards[3], Jeongim Park[4]

[1] Faculty of Applied Sciences, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia

[2] Advanced Medical and Dental Institute, Universiti Sains Malaysia, Bertam, 13200 Kepala Batas, Pulau Pinang, Malaysia

[3] College of Science and Engineering, Flinders University, Bedford Park, South Australia 5042

[4] Dept. of Environmental Health Sciences, Soon Chun Hyang University, Soonchunhyang-ro, Asan-si, Chungcheongnam-do S. Korea, 31538

Corresponding Author: Ismaniza Ismail; ismaniza@uitm.edu.my

ABSTRACT

Objective: Widely used for its effectiveness against bagworm outbreak that affect oil palm yield in plantations, acephate can also cause various acute and chronic health effects related to the nervous system. This study aims to investigate the changes of cholinesterase level in blood of workers following exposure to acephate, and to correlate it with the factors observed. **Method:** Fingerprick blood samples collected from 40 workers pre- and post-exposure were analysed with a Lovibond® cholinesterase rapid test kit. Fieldwork observation was conducted and the used personal protective equipment (PPE) were analyzed qualitatively for potential splash of acephate pre-mixed with fluorescent dyes using UV light. **Findings:** Surprisingly, cholinesterase inhibition of the mixers (off-site) was significantly different ($p=0.0582$) compared to on-site workers; injectors, drillers and pluggers ($p>0.9144$), with potential exposure in the sequence of mixer > injector > driller > plugger reflected by their work practices and techniques of doffing and donning used PPE. **Conclusion** Regardless of the task, the use of PPE should be integrated with precautionary measures throughout the work process, to avoid absorption of acephate through skin contact, inhalation or ingestion.

Keywords: Acephate, blood, cholinesterase inhibition, organophosphates, PPE