

Genotoxicity following organophosphate pesticides exposure among Orang Asli children living in an agricultural island in Kuala Langat, Selangor, Malaysia

ABSTRACT

Background: Agriculture is an important sector for the Malaysian economy. The use of pesticides in agriculture is crucial due to its function in keeping the crops from harmful insects. Children living near agricultural fields are at risk of pesticide poisoning. **Objective:** To evaluate the genotoxic risk among children who exposed to pesticides and measure DNA damage due to pesticides exposure. **Methods:** In a cross-sectional study 180 Orang Asli Mah Meri children aged between 7 and 12 years were studied. They were all living in an agricultural island in Kuala Langat, Selangor, Malaysia. The data for this study were collected via modified validated questionnaire and food frequency questionnaire, which consisted of 131 food items. 6 urinary organophosphate metabolites were used as biomarkers for pesticides exposure. For genotoxic risk or genetic damage assessment, the level of DNA damage from exfoliated buccal mucosa cells was measured using the comet assay electrophoresis method. **Results:** Out of 180 respondents, 84 (46.7%) showed positive traces of organophosphate metabolites in their urine. Children with detectable urinary pesticide had a longer tail length (median 43.5; IQR 30.9 to 68.1 μm) than those with undetectable urinary pesticides (median 24.7; IQR 9.5 to 48.1 μm). There was a significant association between the extent of DNA damage and the children's age, length of residence in the area, pesticides detection, and frequency of apple consumption. **Conclusion:** The organophosphate genotoxicity among children is associated with the amount of exposure (detectability of urinary pesticide) and length of residence in (exposure) the study area.

Keyword: Organophosphates; Pesticides; Organophosphate poisoning; Mutagenicity tests; Comet assay, Child; Malaysia