Assessing the genotoxic damage among farming community: identifying and prioritizing the associated risk factors

ABSTRACT

Objective: This study aims at determining the association between the genotoxic damage with various risk factors among farmers and the children from the pesticide treated rice farming village in a tropical country. Method: A face-to-face interview was conducted to examine the potential risk factors of genotoxicity among farmers and the children. The genotoxicity was measured by micronuclei (MN) assay in detecting the chromosome breakage from their buccal mucosal cells. Result: The findings highlighted that farmers and the children showed significantly ($p<0.05$) higher MN frequency than their unexposed group. Linear regression analysis of various risk factors among farmers revealed that the chromosome breakage changes in accordance to: individual factors ($R^2 =0.199$, $p<0.05$) and occupational factors ($R^2 =0.122$, $p<0.05$). On the other hand, MN frequency among the children increases significantly ($p<0.05$) with number of family numbers (who worked as pesticide sprayer) and residential distance from the pesticide-treated farmland. Linear regression analysis of various risk factors among the children revealed that the chromosome breakage changes significantly due to early farming exposure ($R^2 =0.102$, $p<0.05$). Conclusion: Study emphasizes the need to consider various risk factors which may likely contributing to genotoxic risk. This could help to prioritize the control measures during health risk management among different vulnerable population from long-term and chronic pesticide exposure at the pesticide-treated farming village.

Keyword: Farmer; Children; Pesticide; Risk factors; Genotoxic damage