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Emerging issue of e-waste in Pakistan: A review of status, research needs and data gaps

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This review article focuses on the current situation of e-waste in Pakistan with the emphasis on defining the major e-waste recycling sites, current and future domestic generation of e-waste, hidden flows or import of e-waste and discusses various challenges for e-waste management. Needed policy interventions and possible measures to be taken at governmental level are discussed to avoid the increasing problem of e-waste in the country. Our findings highlight that there is still a general lack of reliable data, inventories and research studies addressing e-waste related issues in the context of environmental and human health in Pakistan. There is therefore a critical need to improve the current knowledge base, which should build upon the research experience from other countries which have experienced similar situations in the past. Further research into these issues in Pakistan is considered vital to help inform future policies/control strategies as already successfully implemented in other countries.

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Genotoxic and chronic effects of pyrethroid exposure in vector control workers and glutation s-transferase (gstm1, gstt1) genetic polymorphism

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Pyrethroids are a class of insecticides in wide use globally. The acute effects of pyrethroid poisoning are well documented, but the possible chronic effects of low dose exposure are insufficiently described. The aim was to investigate the possible genetic damage, and the association between chronic low dose exposure to pyrethroids and diabetes or pre-diabetes. A cross-sectional study was performed among 122 exposed pesticide sprayers from public vector control programs in Bolivia and among 90 non-exposed controls. Pesticide exposure was determined by questionnaire. Blood samples were analyzed for comet assay, GSTM1, GSSTT1 polymorphisms and glycosylated hemoglobin A (HbA1c), a measure of glucose regulation and buccal cells sample for micronucleus. The results of the genotoxic test showed no significant difference between exposed and controls, only in cariorexis analysis ($p<0.007$). The prevalence of pre-diabetes or diabetes was 61.1% among vector control workers and 7.9% among controls – raw OR 18.4 [7.8; 43.6], adjusted OR 11.8 [4.2; 33.2]. A significant positive trend was observed between cumulated pesticide exposure (total number of hours sprayed) and odds of diabetes/pre-diabetes, but only for the vector control workers who had solely used pyrethroids. Caution is warranted when interpreting the results due to the possibility of residual confounding. A healthy worker effect could explain why a dose-response relationship was only seen for the vector control workers that had only used pyrethroids. Pre-diabetes/diabetes was associated to chronic exposure to pyrethroids. Further study is warranted.

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