
Abstract:

**Background:** Pesticide exposure is a risk factor for asthma exacerbations in flower farm regions in the world. Data on levels of serum cholinesterase among asthmatic children exposed to pesticides in Kenya is scanty.

**Objectives:** To compare and identify variables which affect the concentration of serum cholinesterases in children who are exposed and unexposed to pesticides.

**Methodology:** The design was a comparative cross-sectional study that involved exposed and unexposed children. The study was conducted between May and July, 2014 in Naivasha, Kenya. Patients were interviewed and serum samples were analysed for cholinesterase levels. Multi-linear regression was done to identify variables that affected cholinesterase activity.

**Results:** Children who were exposed to pesticides had a lower median ChE activity of 5828 [IQR 4863, 6443] compared to the unexposed arm whose median was 7133 [IQR 6063, 8179]. Five predictor variables were found to be significantly associated with depression of serum cholinesterase levels. The most important predictor variable for the levels of ChE in children, was not using protective clothing by the parent [adjusted $\beta$ -1457.0 (95% CI - 2594, 1319.8)]. Others were not using household pesticides [adjusted $\beta$ 96.3, (95% CI 22.6, 170.0)], female sex [adjusted $\beta$ -695.7 (95% CI -1296.2, - 95.3)], non school attendance [adjusted $\beta$ -1676.8 (95% CI -3371.6, 18.1)] and not taking a break after spraying [adjusted $\beta$ 1105.5 (95% CI (315.0, 1895.2)].

**Conclusion:** Children who were exposed to pesticides had low cholinesterase levels. Parents should therefore be encouraged to wear protective gear as this conferred protection of children from the effects of pesticide exposure.

**Key words:** asthma, exposure, children, pesticides, cholinesterase.

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