

Pesticide exposure and its consequences are of concern all over the world. Although several biomonitoring studies on workers exposed to pesticides have been reported in other parts of the world, there is very limited information on this topic from developing countries where pesticides have been widely used over the years. People in developing countries are at higher risk from exposure, due to poor working conditions and a lack of effective occupation health monitoring programs. To investigate the incidence of pesticide poisoning using serum cholinesterase activity patterns in a horticultural farm, 616 people comprising of 496 pesticide handlers (test group) and a control group of 120 persons participated in the study. A semi-structured questionnaire was used to obtain demographic information, while the activities of serum cholinesterase, serum glutamate oxaloacetate transaminase, serum glutamate pyruvate transaminase, alkaline phosphatase and bilirubin were estimated using standard commercial kits and absorbance measured using kinetic colorimetric tests.

All the pesticide handlers (100%) were males, with majority (80.3%) aged 20-35 years old. Of the test population, 6% had significant cholinesterase enzyme depressions with no symptoms of exposure recorded. Significant difference ($p < 0.05$) was observed in baseline cholinesterase activity between the test and control groups with a calculated intra-personal variation of 5.75%. Between the test and control groups, no correlation was observed on the baseline cholinesterase activity ($r^2 = 0.003$). Difference in cholinesterase activity was not significant ($p > 0.05$) between the test and control groups based on ethnicity or years of handling pesticides. Use of pesticides in successive spray seasons significantly inhibited cholinesterase activity among the spray team, supervisors and harvesters ($p < 0.05$). Higher cholinesterase activity was observed in the 31 - 40 age group with significant changes in cholinesterase activity ($p < 0.05$) observed among those aged below 40 years. Significant association was not found for use of alcohol or cigarette smoking.

The findings indicate that over 70% of the pesticide handlers maintained cholinesterase activity close to baseline level despite working with pesticides, suggesting that with improved controls, workplace exposures can be greatly reduced. Also, the supervisors, sprayers and harvesters were the most affected groups, signifying that better controls on workplace exposure to pesticide is required in these groups of workers.