

Impact of Pesticide on Workers Health of Pesticide Formulation & Packing Plants in Pakistan

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ABSTRACT

Aim: To evaluate the Impact of pesticides on workers health of pesticide formulation & packing plants in Pakistan.

Methods: 100 workers from different pesticides industrial units working at least for one years in the age group of 20-50 years and 100 healthy persons taken as control having matching social status, gender, age and no exposure to pesticides.

Results: 21% of pesticide industrial workers had no complaint, 40% complaining of weakness, 17% complaining of itching, 10% complaining of Backache, 9% complaining of cough and 3% complaining of joint pain. On the other hand 43% of control subjects had no complaint, 34% complaining of weakness, 10% complaining of cough, 7% complaining of backache, 5% itching and 1% complaining of joint pain. Chi-square test was applied and P value was significant for "itching" and "no complaints".

Conclusion: Pesticide industrial workers had more general health problems like generalized weakness, itching, backache, cough etc. as compare to control subjects.

Keywords: Pesticide, industrial workers, health

INTRODUCTION

Pesticides are frequently used agrochemicals worldwide, although some of them is forbidden due to recognized side effect on the health of those individual who use them. Formulation of Pesticide involves two ingredients i.e. "active" and "inert" ingredients. Active ingredients kill the pest, and inert ingredients (solvents) are necessary for active ingredients to work properly. These inert ingredients (solvent) may be toxic if inhaled or absorbed by the skin. These pesticides show high toxicological and undesirable effects on various tissues. After exposure to pesticide, effects on individual, sheath may be immediate or delayed¹ and usually involved persons are farmers or pesticide industry workers. Acute or immediate health problem are nausea, vomiting, headache, dizziness, abdominal pain, skin or eye problems, and accidental ingestion etc². Delayed or long term effects include neurological problems³ such as memory loss, loss of coordination, reduced speed of response to stimuli, reduced visual ability, altered or uncontrollable mood and general behavior, and reduced motor skills, risk of cancer⁴, reproductive effects like infertility⁵, birth defects or fetal death³, skin problems like dermatitis³, greater risk of diabetes⁶. Other possible health effects include asthma, allergies, and hypersensitivity. In China, every year approximately five lakh people are poisoned by pesticides from which five hundred may die⁷. Payán-Rentería et al, (2012)⁸ reported that Mexican farm workers exposed to pesticides, had substantial hepatotoxicity, also Cecchi et al, (2012)⁹ reported hepatotoxicity in pregnant women exposed to pesticides.

In Pakistan there is a tremendous use of pesticides without any proper monitoring. In accordance with this assumption, Azmi et. al. (2005)¹⁰ evaluated, side effects of

improper use of pesticides on farmers in Gadap (rural area) Karachi. Their results indicated that ALP, ALT and AST levels were considerably raised in the samples of the subjects as compared to the controls which shows hepatotoxicity due to improper pesticide exposure. Many researchers like Altuntas et. al (2002)¹¹, Dahamana et al. (2004)¹² reported that many pesticides severely disrupt the enzymatic levels in persons exposed to the pesticides.

MATERIALS AND METHODS

This cross-sectional study which includes 100 workers from different pesticides industrial units working at least for one years in the age group of 20-50 years and 100 healthy persons taken as control having matching social status, sex, age and no exposure to pesticide. Known diabetic, hypertensive, obese, having previous H/O jaundice and hepatitis B or C positive cases were excluded from the study.

From both groups blood samples for liver function tests taken and history proforma filled for assessing general health. Chi-square test was applied for general health problems and p value of less than 0.05 was considered statistically significant.

RESULTS

In the present work blood samples of 200 workers were taken; 100 workers from other than pesticides industry called as control group and 100 pesticides industrial workers. ALP, ALT, AST were performed on Auto Analyzer Dimension RXL, Dade Behring. Screening for Hepatitis B and C virus was done by immunochromatographic technique to confirm that all the samples included in current study were negative for Hepatitis B and C virus.

The results Data of 100 pesticides industrial workers were taken and it was found that ALP, ALT, AST of 80 workers out of 100 were within the normal range whereas 20 workers had abnormally raised level of ALP, ALT, AST

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and they have more health problems as compared to others.

Data on health problems of both groups were obtained through history Performa and are given in (Table 1, Figure 1). Cross tabulation was done and it was noted that 21% of pesticide industrial workers had no complaint, 40% complaining of weakness, 17% complaining of itching, 10% complaining of Backache, 9% complaining of cough

and 3% complaining of joint pain. On the other hand 43% of control subjects had no complaint, 34% complaining of weakness, 10% complaining of cough, 7% complaining of backache, 5% itching and 1% complaining of joint pain. Chi-square test was applied and P value was significant for "itching" and "no complaints" and might be attributed to exposure of pesticides.

Table 1: Prevalence of Health problems among pesticides workers and control subjects and results of chi-square test

| Health Problems | Pesticide Industrial Workers (n=100) | Control Subjects (n=100) | $\chi^2(1)$ | P value |
|-----------------|--------------------------------------|--------------------------|-------------|----------|
| Backache | 10 | 7 | 0.529 | 0.467 |
| Cough | 9 | 10 | 0.053 | 0.819 |
| Itching | 17 | 5 | 6.545 | 0.011* |
| Joint Pain | 3 | 1 | 1.00 | 0.317 |
| Weakness | 40 | 34 | 0.486 | 0.485 |
| No Complain | 21 | 43 | 7.56 | 0.006*** |

*p<.05, ***P<0.001

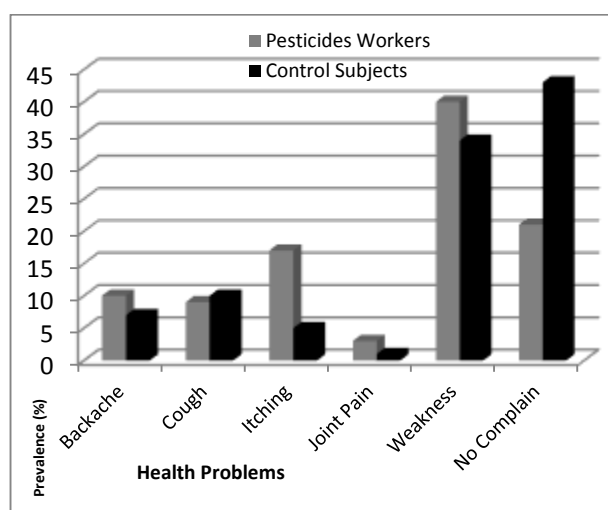


Fig. 1: Prevalence (%) of Health problems among Pesticides Workers and Control Subjects

DISCUSSION

Common reported toxicity symptoms like skin rash, headache, excessive sweating, and diarrhea due to pesticide exposure are considered to be common manifestations of acetylcholine esterase-inhibiting insecticides¹³. These findings require immediate intervention to prevent the risk of these symptoms. Many studies showed that highly hazardous¹⁴ pesticides like organophosphate and carbamate insecticides were commonly used which were noticed by some scientists in order to reduce their use so that toxicity symptoms goes down¹⁵.

Regarding the general health problems, 80 percent of the pesticides industrial workers were complaining of mild to moderate health problems as compared to 60 percent of control subjects. Most of the workers in both the groups were complaining of generalized weakness which might be due to poor diet, over work, lack of rest etc. Other dominant complaint of pesticide industrial workers was itching which might be due to local effect of pesticides when in contact with the skin. Other complaints like backache, Joint pain,

cough may not be attributed to the pesticides exposure as both groups had similar complaints.

In developing countries excessive use of pesticides may be due to the ignorance of the sustainability of pesticide use, non availability of alternatives to pesticides, and the weak enforcement of regulations and laws on pesticide use¹⁶. In this study educational background of the pesticide industrial workers was low. In many developing countries similar results were also reported¹⁷. Farm or industrial workers when using pesticides with having low educational background might be at higher risk possibly due to difficulties in understanding the instructions for safety measures written on product labels. For the prevention of any poisoning workers must have knowledge about hazards and must discourage erroneous beliefs to protect themselves against pesticides risks¹⁸.

CONCLUSIONS AND RECOMMENDATIONS

Pesticide industrial workers had more general health problems like generalized weakness, itching, backache, cough etc. as compare to control subjects.

On the basis of above conclusion following recommendations are made:

- The pesticide industrial workers should be educated about the hazardous or toxic effects of pesticides and use of safety measures.
- General public sector regulatory authorities and the local pesticides industry should be sensitized to ensure periodical medical examination of the workers after appropriate time interval by a qualified Doctor.

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