

## ASSESSMENT OF THE HEALTH RISK AMONG AGRICULTURAL WORKERS EXPOSED TO PESTICIDES IN DEOLI BLOCK WARDHA DISTRICT

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### ABSTRACT

**Title:** Assessment of the Health risk among agricultural workers exposed to pesticides in Deoli Block Wardha District

**Objectives:** 1) To assess the awareness & preparation of handling pesticide and its storage by the agricultural workers. 2) To find and compare the current health status between agricultural workers exposed to pesticide and non-agricultural workers.

**Introduction:** Pesticides affect health of farmers. It may be simple irritation of skin and eye to more severe effects such as affecting the nervous system. Disorders which are seen more commonly are mild conditions like irritation of nose, throat, and eyes. Pesticides are used extensively throughout the world.

**Methodology:** A Cross-sectional study was conducted in Deoli which is 15 km away from Wardha. Agricultural pesticide sprayers and non Agricultural workers visiting RHTC Deoli in the Department of Community Medicine

**Results:** Pesticide sprayers and 5(6.02%) of non agricultural workers were educated up to middle school level, 32(38.55%) of agricultural pesticide sprayers and 17(20.48%) of non agricultural workers were educated up to high school level, 6(7.22%) of agricultural pesticide sprayers and 15 (18.07%) of non agricultural workers were educated up to junior college level. Running nose 15(18.07%) in agricultural pesticide workers (agricultural pesticide sprayers) compare to 10(12.04%) non agricultural workers, burning of eyes 48(57.83%) in agricultural pesticide workers compared to 15 (18.07%) in non agricultural workers, itching of eyes 30(36.12%) in agricultural pesticide sprayers compared to 2(2.40%) in non agricultural workers, excessive sweating 20(24.09%) in agricultural pesticide sprayers compared to 10(12.04%) in non agricultural workers.

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### INTRODUCTION

Pesticides affect health of farmers. It may be simple irritation of skin and eye to more severe effects such as affecting the nervous system. Disorders which are seen more commonly are Mild conditions like irritation of nose, throat, and eyes. Pesticides are used extensively throughout the world <sup>(1)</sup>. The unregulated and excessive use of pesticides has become a major bottleneck in human fight against insect pests. So the pesticides are very harmful for human health especially for farmers who are more in contact with them. <sup>(2)</sup>

Low education levels of the rural population, lack of information and training on pesticide safety, poor spraying technology, and inadequate personal protection during pesticide use have been reported to play a major role in the intoxication scenario. In general knowledge of the main determinants of pesticide exposure in developing countries is often poor and also exposure situations may differ among countries. <sup>(3)</sup>

**Objectives:** 1) To assess the awareness & preparation of handling pesticide and its storage by the agricultural workers. 2) To find and compare the current health status between agricultural workers exposed to pesticide and non-agricultural workers.

**Methodology:** Deoli is 15 km away from Wardha. This study was conducted in Rural and Health Training Centre Deoli, in the field practice area of Department of Community Medicine Jawaharlal Nehru Medical College (JNMC). It was a Cross Sectional study. Sample size was calculated as 83 based on previous study done and literature review. The data was entered into a computerized Excel (Microsoft Excel 2007) spreadsheet. Subsequently it was analyzed using SPSS (Statistical Package for Social Sciences) Version 16.0. Institutional Ethical committee of Jawaharlal Nehru Medical College was taken, consent of each study participants were done.

**RESULT:**

**Table no 1: Distribution of Study Population according to the Age and Education**

Variables	Agricultural Pesticide Sprayers n=83(%)	Non Agricultural Workers n=83(%)
<b>Age in years</b>		
18-30	24 (28.91%)	24 (28.91%)
31-50	43 (51.80%)	40 (49.39%)
>51	16 (19.27%)	18 (21.66%)
Mean Age ± SD	38 ± 12	39 ± 12
Mean BMI ± SD	22.55 ± 3.00	24.17 ± 3.13
<b>Education Status</b>		
Illiterate	8 (9.63%)	16 (19.27%)
Primary school	13 (15.66%)	11 (13.25%)
Middle school	15 (18.07%)	5 (6.02%)
High school	32 (38.55%)	17 (20.48%)
Junior College	6 (7.22%)	15 (18.07%)
College	9 (10.84%)	19 (22.89%)

The age group of 18-30 years agricultural pesticide sprayers were 24(28.91%) and non agricultural workers were 24 (28.91%), between 31-50 years of age group 43(51.80%) and non agricultural workers were 40(49.39%). Non agricultural workers were illiterate. 13 (15.66%) of agricultural pesticide sprayers and 11 (13.25%) of non agricultural workers were educated up to primary school.

**Table No 2: Distribution of the study population according to the behavior of the pesticide sprayer, use of the personal protective measures, pesticide contact and its use.**

Variables	Agricultural Pesticide Sprayers n=83 (%)
<b>Place for Pesticide Preparation</b>	
Home	12 (14.45%)
In the field	71 (85.55%)
<b>Use of Protective measures during Pesticide preparation</b>	
Yes	14 (16.86%)
No	69 (83.14%)
<b>Use of Protective measures during Pesticide spraying</b>	
Yes	32 (38.55%)
No	51 (61.45%)
<b>Use of bare hands to mix pesticides</b>	
Yes	60 (72.29%)
No	23 (27.71%)
<b>Wearing full sleeve shirt while spraying</b>	
Yes	26 (31.32%)
No	57 (68.68%)
<b>Pesticide contact with body parts</b>	
Hands	24 (28.91%)
Legs	7 (8.43%)
Face	1 (1.20%)
Body	51 (61.44%)
<b>Types of Pesticide use in Field</b>	
Only Insecticides	9 (10.84%)
Only Herbicides	3 (3.61%)
Only Fungicides	2 (2.40%)
Insecticides+ Herbicides+ Fungicides	69 (83.13%)

60 (72.29%) of agricultural sprayers prepared pesticides by bare hands while 23(27.71%) used protective measures. 57 (68.68%) of agricultural pesticide sprayers didn't use full sleeve shirt while spraying the pesticides. While 26(31.32%) of agricultural pesticide sprayers dressed up full sleeve shirt while spraying the pesticide.

**Table No 3: System wise distribution of General morbidities in the study population**

Morbidities	Agricultural Pesticide Sprayers, n=83 (%)	Non Agricultural Workers n=83 (%)	Chi Square test
<b>Morbidity in Ear and Eye</b>			
Near vision	15 (18.07%)	13 (15.26%)	$\chi^2=5.817$ DF=4 P=0.213
Far vision	12 (14.45%)	15 (18.07%)	
Watering of eyes	32 (38.55%)	19 (22.89%)	

Pains in eyes	20 (24.09%)	12 (14.45%)	NS	
Irritation of eyes	36 (43.37%)	15 (18.07%)		
<b>Morbidity in Respiratory system(RS)</b>				
Dry cough	20(24.09%)	08 (9.63%)	$\chi^2=1.753$ DF=3 P=0.856	
Frequent cold	10 (12.04%)	6(7.22%)		
Irritation of throat	16 (19.27%)	10 (12.04%)		
Nose secretion	10 (12.04%)	9 (10.84%)	NS	
<b>Gastro-Intestine System(GIS)</b>				
Appetite reduce	26 (31.32%)	15 (18.07%)	$\chi^2=1.011$ DF=9 P=1.000	
Hyperacidity	6 (7.22%)	3 (3.61%)		
Constipation	5 (6.02%)	2 (2.24%)		
Piles	8 (9.63%)	5 (6.02%)	NS	
Burning sensation in abdomen	6 (7.22%)	4 (4.81%)		
Pain in abdomen	22 (26.50%)	15 (18.07%)	$\chi^2=0.109$ Df=2, p=0.947 NS	
Stomach cramps	15 (18.07%)	12 (14.45%)		
Nausea	6 (7.22%)	4 (4.81%)		
Epi-gastric pain	26 (31.32%)	15 (18.07%)		
Diarrhea	5 (6.02%)	3 (3.61%)		
<b>Genitor urinary system</b>				
Frequent urination	20 (24.08%)	15 (18.07%)		$\chi^2=0.109$ Df=2, p=0.947 NS
Kidney stone	3 (3.61%)	3 (3.61%)		
Burning micturition	25 (30.12%)	20 (24.09%)		
<b>Nervous System</b>				
Headache	30 (36.14%)	20 (24.09%)	$\chi^2=23.746$ Df=5 P=0.000	
Dizziness	20 (26.50%)	0 (0.00%)		
Tremors	12 (14.23%)	8 (9.63%)		
Fatigue	35 (42.16%)	26 (31.32%)	S*	
Blurred vision	29 (34.93%)	3 (3.61%)		
Numbness	35 (42.16%)	25 (30.12%)		

Morbidities related to Respiratory system were dry cough 20 (24.9%) in agricultural pesticide sprayers compared to 8(9.63%) non agricultural workers, frequent cold 10(12.04%) in agricultural pesticide sprayers compare to 6 (7.25%) non agricultural workers, irritations of throat 16(19.27%) in agricultural pesticide sprayers 10(12.04%) non agricultural workers. Morbidities related to Gastro-intestinal system were, reduces in appetite 26(31.32%) in agricultural pesticide sprayers compare to 15(18.07%) non agricultural workers, epigastric pain 26(31.32%) in agricultural pesticide sprayers compare to 15(18.07%) non agricultural workers.

**DISCUSSION**

**Socio-economic class:** Most of the participants belonged to socio-economic class III and IV, according to the B G Prasad's classification. In class III 31.32% of agricultural pesticide sprayers and 79.51% non agricultural workers were present and in class IV 63.85% of agricultural pesticide sprayers and 14.45% non agricultural workers were present.

It was found that most of the participants in both the study groups were literate i.e.85.55%. Total agricultural pesticide sprayers and non agricultural workers literate population was 90.36% and 80.72% respectively. Total illiterate agricultural pesticide sprayers and non agricultural workers population was 9.63% and 19.27% respectively.

**Patil DA et al, 4 in 2012,** studied in Shirol region of Kolhapur district Maharashtra that maximum workers were from the age group between 30 to 50 years in both male and female i.e. n male 61.72% and in female 68.42%.In this study maximum participants in male i.e. 48.15% and in female 57.90% were illiterate.

Most of the agricultural pesticide sprayers i.e. 55.42% were spraying pesticides for more than 5 years. Most of the pesticide sprayers i.e. 53.01% were regular pesticide sprayers. Pesticide sprayers were subdivided into two group's i.e. occasional and regular sprayers. Those who sprayed pesticide for at least 1 hour/day or 7 days a

month for the past 5 years or more were considered as regular and rest of them were considered as occasional sprayers. Chakroborty S et al, in 2009<sup>5</sup> studied on pesticide exposed agricultural workers; they sub-divided sprayers into two groups, regular and occasional sprayers. Workers who sprayed for at least 1 hour/day or 5 days a month for the past 5 years or more were considered as regular and rest of them were considered as occasional sprayers.

38.55% of agricultural pesticide sprayers stored pesticide inside the house while 25.30%, stored pesticide inside the plantation area followed by 16.85% agricultural pesticide sprayers didn't store pesticides. 33.72% of agricultural pesticide sprayers re-used the empty packages of pesticide for the household purpose. 24.90% agricultural pesticide sprayers didn't take bath after spraying pesticides. 30.12% of agricultural pesticide sprayers didn't change clothes after spraying pesticides. Fareed M et al,<sup>6</sup> in the year 2013 studied in Lucknow district in North India. A Cross-sectional study was undertaken among 166 pesticide sprayers working in the mango field with 77 non agricultural workers. In this study they found that 43.98% of the pesticide sprayer's stored pesticides inside the house, 12.05% of the pesticide sprayers stored pesticides inside a plantation area, 18.07% of the pesticide sprayers didn't store pesticides and also they found that 36.14% of pesticide sprayers mixed pesticides by bare hands.

#### CONCLUSION

In this study it is concluded that the most of the study participants had low level of knowledge regarding pesticide use, proper protective measures, highlight the importance of observing basic protective measures during pesticide spraying, as their nonobservance was found to be associated with various symptoms observed. Exposure to pesticides among farmers and farmer's families is a major health threat. This well known fact is one obvious and

important rational for safe handling and practices of pesticides.

#### RECOMMENDATIONS

Provision of proper guideline for spraying pesticide techniques should be provided. Need to have intense information, education and communication (IEC). Selection of appropriate pesticides and their handling and use as per the label are the most important steps for safe use of chemical pesticides.

#### REFERENCES

- 1) Sharma DR, Thapa RB, Manandhar HK, Shrestha SM, Pradhan SB. Use of Pesticides in nepal and impacts on human health and environment. The Journal of Agriculture and Environment .2012;13:67-72
- 2) Mancini F, Janice LS, Jiggins, O'Malley M. Reducing the Incidence of Acute Pesticide Poisoning by Educating Farmers on Integrated Pest Management in South India. Int J occup environ health. 2009;15:143-151
- 3) Giannandrea F, Iezzi DF. Effectiveness of Interventions to Reduce Pesticide Exposure in Agriculture. Journal of Environments.2014; 1: 25-9
- 4) Patil DA, Katti RJ. Modern agriculture, pesticides and human health: a case of agricultural laborers in western Maharashtra. Journal of Rural Development. 2012; 31(3): 305 - 318.
- 5) Chakroborty S, Mukherjee S, Roychoudhury S, Siddique S, Lahir T, Ray RM..Chronic Exposures to Cholinesterase-inhibiting Pesticides Adversely Affect Respiratory Health of Agricultural Workers in India. J Occup Health .2009; 51: 488-497
- 6) Fareed M, Pathak MK, Bihari V, Kamal R, Srivastava AK, Kesavachandran CN. Adverse Respiratory Health and Hematological Alterations among Agricultural Workers Occupationally Exposed to Organophosphate Pesticides: A Cross- Sectional Study in North India. PLOS ONE.2013; 8(7)

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