Research Paper Medical Science

Study of the Chemical Related Occupational Health Hazards Amongst Agricultural Workers in the Rural Area of Maharashtra, India

* Vijay Kumar Manwani ** Sachin Pandey

* Assistant Professor,Department of Community Medicine, CIMS Bilaspur(C.G.)

** Assistant Professor, Department of Community Medicine, CIMS Bilaspur(C.G.)

ABSTRACT

Background: India being a country of agriculture, majority of its population is engaged in agriculture based activities. This sector of activity being most unorganized, very little attention has been given to the occupational health problems of these workers.

Objectives-1) To find out the magnitude of cases 2) To find out the protective measures being used by the AWs 3) To give the necessary recommendations.

Methodology- It is a Cross-Sectional study. The study was conducted from the period of June 2009 to Dec 2011.

Results: Total 305 patients of agricultural poisoning were studied, out of these 181 (59.34%) were males and 124(40.66%) were females. Majority (69.84%) of the respondents have some kind of addiction. Majority of the cases of insecticide poisoning were due to OPP (44.97%), followed by Amitraz compound (22.15%), Organochlorine compounds (18.79%), Pyrethrins and Pyrethroids (7.38%) and least cases of Carbamates poisoning (6.71%). Only 15.08% were using any kind of PPE.

Keywords : AWs: Agricultural Workers,OPP:Organophosphorus Poisoning,PPE:Personal Protective Equipments

Introduction

Agriculture is considered to be one of the oldest occupations, perhaps as old as human civilization. Approximately 2 billion people are engaged in agriculture and related work in the developing countries of Asia, whereas the developed countries contribution is merely 100 millions[1]. In a country like India, large workforce is employed in diverse settings. Today we have 360 million workforce, of which 225 million in agriculture & 120 million are in industrial sector[2]. In the last 50 years, due to rapid industrialization, India has been considered as a newly industrialized country. In spite of this 50% of our Gross Domestic Product is still being contributed by agriculture sector. Thus, this sector is very vital and the most important sector of our economy. Agriculture workers (AWs) are the main pillars for growth and development of this sector.[3]

In the fourth report of the joint ILO/WHO committee on occupational health, an agriculture worker means any person engaged either permanently or temporarily, in activities related to agriculture, irrespective of his/her legal status[4].In India Ministry of Labour includes ploughing, sowing, weeding, transplanting, harvesting, cultivation, forestry, plantation, fisheries, and others as principal agricultural operations[5]. One of the distinguishing characteristics of the agriculture work is that, it is carried out in an essentially rural environment where working and living conditions are interwoven. Agricultural work is subject to the health risks inherent to a rural environment and at the same time to those deriving from the specific work process involved[6]. India being a country of agriculture, majority of its population is engaged in agriculture based activities in a varied manner either directly or indirectly. This sector of activity being most unorganized, very little attention has been given to the occupational health problems of these workers; though the need of investigation and intervention towards these problems has repeatedly been mentioned[7].

Objectives-

1) To find out the sociodemographic profile of the cases of chemical related health hazards amongst agricultural workers.2) To find out the magnitude of the cases of chemical related health hazards amongst agricultural workers . 3) To find out the protective measures being used by the agricultural workers for the prevention of chemical health hazards.4) To give the necessary recommendations for the prevention of hazards.

Material & Methods-

Study design- It is a Cross-Sectional study. The study was conducted from the period of June 2009 to December 2011.

Study Area: Pravara Rural Hospital of Rural Medical College Loni falls under Ahmednagar District of Western Maharashtra, which is a tertiary care teaching hospital chiefly catering the demands of Ahmednagar and adjacent districts of Maharashtra and thus acts as an apex referral institution.. Ahmednagar district has 80.34% rural population and 19.66% urban population. Majority of the people in study area are engaged in agricultural activities. **Data Collection**) 1) A pilot study was conducted on 30 patients for the finalization of the proforma. Data collection was done through asking questionnaire from the patients/relatives; clinical examination and clinical case records of the patients. All the findings were endorsed in the proforma. **Analysis of Data:** Data was analyzed in the form of percentage (%) and proportion and presented in the tabular form. Chi- square (χ^2) test was applied as a test of significance with the help of statistical software SPSS statistics (version- 17).

Results

In the present study total 305 patients of chemical related health hazards were studied, out of these 181 (59.34%) were males and 124(40.66%) were females. Majority (85.90%) of the respondents in the present study have some kind of ad-

diction in the form of alcohol (8.52%),smoking(6.23%),smokeless tobacco(gutkha, khaini,mishri, 43.61%) or multiple addictions(11.48%).For instances person who is engaged in spraying of pesticides may consume gutkha or tobacco with lime in between the operations without washing the hands. Alcohol decreases inhibitory control on mind, there by increase chances of risk taking behaviour and not taking adequate precautions and PPE.Secondly it will affect concern span and performance of skill operations like operating mechanical devices and equipments in various agricultural activities. Majority of the cases (48.85%) were due to insecticides followed by unknown compound (40%), others (5.57%), herbicides (3.28%) and rodenticides (2.30%). Majority of the cases (44.97%) of insecticide poisoning were due to Organophosphorus compound followed by Amitraz compound (22.15%), Organochlorine compounds (18.79%), Pyrethrine and Pyrethroids (7.38%) and least cases of carbamates poisoning (6.71%).Majority of the respondents following unsafe practices like unsafe disposal of the empty containers(93.77%), followed by not reading instructions during use of pesticides, improper storage at home (81.31%), no handwashing(73.11%) after use of pesticides and before taking food, not following against direction of wind while spraying(63.27%) and mixing by hands(47.21%) while making pesticides preparations. Majority of the cases were not using (84.92%) personal protective equipments and only 15.08% were using any kind of PPE .

Discussion

In comparison to the present study JE Cornwall et al. (1995)8: also found that organophosphate (OP) was used on 96% of farms and observed use of protective measures was significantly less than, that reported by farm workers. Francesca Mancini et al. (2005)9: Conducted study of acute pesticide poisoning among female and male cotton growers in Andhrapradesh, India. Out of 323 reported events, 47% of the cases were due to organophosphorus poisoning (OPP). Vander Hoek W and Konradsen F. (2005)10: Studied the risk factors for acute pesticide poisoning in to two rural hospitals in Sri-Lanka. Most cases (84%) was because of intentional self-poisoning. Alcohol dependence was a risk factor. Singh B (2006)11: Conducted a retrospective study of acute poisoning cases from agricultural and horticultural chemicals in Pravara Rural Hospital, Loni. Out of total 1856 patients were admitted to intensive care unit, of which 312(81.0%) cases were due to agricultural and horticultural chemicals. In 13.8% of the cases identity of the poison could not be ascertained. Organophosphorus was the most commonly used suicidal poison. Males (28.8%) were preponderant in age group of 21 to 30 years followed by females (14.8%) in the same age group. Singh B and Gupta MK (2009)12: Studied pattern of use of personal protective equipments and measures during application of pesticides by agricultural workers in a rural area of Ahmednagar District, Maharashtra, India.Majority of the workers/applicators used no personal protection measures or used it defectively/ partially. Most of the workers/respondents (77%) did not bother for safety and health risks of pesticide exposure. Almost half of the applicators were not following right direction with respect to wind direction while spraying, thus it increase the risk of exposure. Dilshad Ahmed Khan et al. (2010)13: also found that most of the farmers did not use any personal protective equipment during pesticide handling.. Bonani Mazumdar (2011)14: Conducted a study on the harmful Effects of pesticides used in the cultivation of Brinjal in Longai River Valley, Karimganj, Assam, India. The farmers who cultivate brinjal in this place use a large number of insecticides followed by herbicides and fungicides for protection of the crop and better yield. It has been noticed that 99% of the farmers do not know the proper use of pesticides. Majority of the farmers use their house for storing the agro-chemicals. Moreover they hardly use any preventive measures while spraying the chemicals in the field.

Tables & Charts

Table No.:1 – Addiction pattern of cases

Type of addiction	Male(%)	Female(%)	Total(%)
Addiction present	167(54.75)	46(31.15)	213(85.90)
No addiction	14(4.59)	78(9.51)	92(14.10)
Total	181(59.34)	124(40.66)	305(100)

Value of $\chi 2$= 101.89,df=1,p<0.001, highly significant

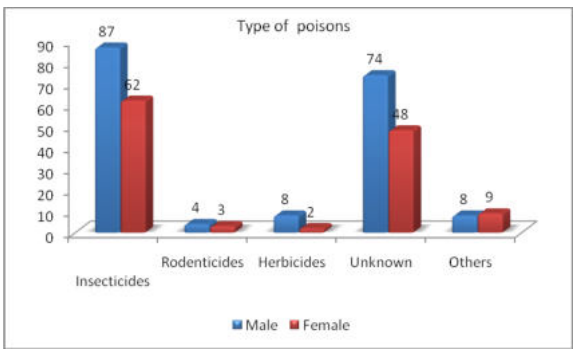


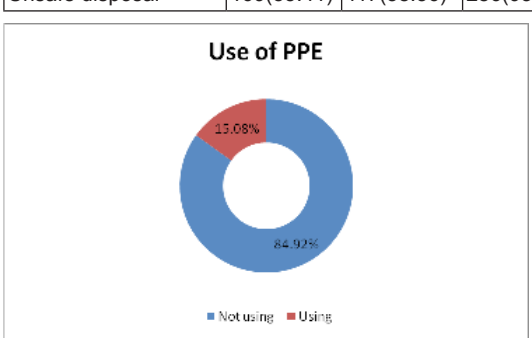
Table No.:02 – Type of insecticides among cases

Type of Insecticide	Male(%)	Female(%)	Total(%)
Organophosphorus	49(32.89)	18(12.08)	67(44.97)
Organochlorine	16(10.74)	12(08.05)	28(18.79)
Carbamates	02(01.34)	08(05.37)	10(06.71)
Pyrethrine and pyrethroids	04(2.68)	07(04.70)	11(07.38)
Amitraz	16(10.74)	17(11.41)	33(22.15)
Total	87(58.39)	62(41.61)	149(100)

Value of $\chi 2$= 5.608,df=4,p<0.01, significant

Table No.:03 – Unsafe practices amongst cases (n=305,- multiple response)

Unsafe Practices	Male(%)	Female(%)	Total(%)
Improper Storage	139(45.57)	109(35.74)	248(81.31)
Not Reading instructions	154(50.49)	112(36..72)	266(87.21)
Mixing by hands	89(29.18)	55(18.03)	104(47.21)
Not following against direction of wind	106(34.75)	87(28.52)	193(63.27)
No handwashing(after use and before food)	141(44.92)	106(28.19)	223(73.11)
Unsafe disposal	169(55.41)	117(38.36)	286(93.77)



Conclusion

So from the present study we can conclude that, various types of poisonings; are the common agriculture related chemical hazards which are frequently found amongst the agricultural

workers. If these hazards are addressed correctly, can be prevented by simple precautionary and protective measures.

Recommendations

Based on the observations of the present study we suggest following recommendations:

The proper handling and disposal of concentrated material and while spraying the sprayer should move against the direction of wind and should follow the instructions of pesticide safety manual.

Most important control for mixers and applicators is protective clothing. Protective gears such as gloves, face shields, aprons and boots can effectively reduce exposure.

Provision of hand-washing facilities for the removal of pesticides residue before eating & at the end of work day.

Restriction of the sale and storage of pesticides should be undertaken by strict and stringent application and enforcement of regulations and legislations.

Sale of alcohol and tobacco products should be restricted and its use should be discouraged by health education of the farmers.

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