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Preliminary Survey for Pesticide Poisoning in Pakistan

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Abstract: Pesticide poisoning cases were reviewed in 72 medical centers: District Hospital (30) and Basic Health Unit (42) throughout the country. Total 408 poisoning cases were recorded. Of these 165 (40.4%) were accidental and 243 (59.6%) were suicidal. The total number at deaths due to suicidal poisoning was found to be 63 (26%) from 243 suicidal attempts. Whereas, survival rate was hundred % in accidental poisoning cases. Major causes of accidental/intentional (Suicidal) have been identified and factors contributing occupation related acute pesticides poisoning are discussed in detailed.

Key words: Pesticide, human health, accidental, intentional, occupational and poisoning

Introduction

The World Health Organization (WHO) and United Nation Environmental Program estimate that 1-5 million cases of pesticide poisoning occur among agricultural workers each year with about 20,000 fatalities (WHO, 1990). The majority occurs in developing countries (Rosenstock *et al.*, 1991; Pimentel *et al.*, 1992). The true incidence of poisoning is likely to be considerably higher since estimate is based on self reported cases (Jeyaratnam *et al.*, 1987) or inference from vital statistics (Loevinsohn, 1987). This estimate was made by extrapolation of data from Sri Lanka, where in addition to unintentional pesticide poisoning suicide by ingestion of pesticides is also frequent (Levine and Doull, 1992). In a study carried out in four South East Asian countries (Indonesia, Sri Lanka, Malaysia and Thailand) 2-7% of the agricultural workers reported an episode of pesticide poisoning each year. When this figure is extrapolated to all developing countries (830 million agricultural workers) it results in an estimation of approximately 25 million cases of pesticide poisoning each year in the developing world. The estimates fluctuate because the results were extrapolated from registered cases only. However, the majority of people who suffer from pesticide poisoning are not hospitalized and as a consequence are not usually registered (Jeyaratnam, 1990; Jeyaratnam *et al.*, 1987).

In Pakistan first documented study was carried out at the causality department of the Mayo Hospital Lahore was reported by Sarwer (1973). Followed by Jamil (1989, 1990) and Chaudhry *et al.* (1992). Besides review of hospital cases, community survey on acute health effect of pesticide was reported by Jabbar and Ata-ul-Mohsin (1992) and Khan and Reza (1998). Very few studies on chronic pesticide poisoning were also conducted in Pakistan (Masud, 1991; Naqvi and Jahan, 1996; Hussain, 1999; Masud and Parveen, 1998). Situation on human health reviewed by Inayatullah and Haseeb (1996) and Feenstra *et al.* (2000).

In developing countries, like Pakistan working conditions are poor and educational levels are low, This prevents people to take an active approach in combating pesticide poisoning. Lack of information about safe use of chemicals, combined with a hot climate which makes wearing of protective clothing uncomfortable are factors responsible

for the high risk of poisoning with pesticides (Forget, 1991; Elsebae, 1993; Liesivouri, 1993). Pesticide can enter the human body by ingestion, through the skin or by inhalation of fumes. Another mode of exposure is through contact with pesticides accumulated in the environment. Pesticides can accumulate in soil, water and food items (Masud and Akhter, 1997).

Pesticide exposure may result in chronic or acute poisoning. Chronic poisoning implies that a person is exposed to small doses of pesticides over a prolonged period of time (Repetto and Baliga, 1996). Acute poisoning relates to people who are accidentally, or intentionally exposed to a high dose of chemicals, The symptoms of acute poisoning can vary from skin irritation to a complex systemic illness resulting in death (Forget, 1991). Accidents are potential source of excessive exposure of pesticides to handler, loaders, applicators and harvester are over exposed as a result of illegal pesticide use or inadequate reentry intervals.

In Pakistan very few data are available on pesticide related illness. Baseline descriptive epidemiological data on the extent of pesticide poisoning are urgently needed. Therefore, an attempt was made to review the pesticide poisoning cases and to identify the factors contributing occupation related acute poisoning. This study will help the decision making concerning in human health and appropriate preventive intervention as the human data warrant greater reliance in risk assessment process.

Materials and Methods

The 30 hospitals and 42 Rural Health Units (RHU)/Basic Health Units (BHU) were surveyed in Pakistan. Hospitals from Punjab (11): Multan (2), Lodhran (1), Bhawalpur (1) Lahore (2), Rawalpindi (2), Chakwal (1), Kharian (1) and Gujrat (1); From Sindh (12): Karachi (1), Hyderabad (1), Tando Allatiyar (1), Mirpure (1), Dadu (1), Sehwan Sharif (1), Pano Agit (1) Ghotki (1), Khairpur (1), Sukkur (2). From NWFP (6): Peshawar (3), Kohat (2) and D.I. Khan (1). From Capital area (1): Islamabad. Similarly 42 RHU/BHU were also surveyed including Punjab (16): Multan (1), Lahore, Chemical examination laboratory (1), Kharian (6), Gujrat (3) Sialkot (1) and Mandi Bahauddin (4). Sindh (7): Dadu (2), Khairpur (2), Sukkur (2) and Tandojam (1). NWFP (16):

Peshawar (3) Charsada (5), Kohat (4) and D.I. Khan (4). Federal Area (3): Tarlai (1). Jhang Syadan (1) and Charah (3). The clinical records were analyzed to estimate acute pesticide poisoning. All the hospitals cases classified as poisoning were specially reviewed for the study. Information collected includes personal: name, sex, age occupation, family history and address and subjective: date, type and reason of poisoning, date of recovery, treatment/antidotes. Pesticides shops in NWFP were visited. Doctors and persons involved in pesticide business were interviewed. Discussion was also made with workers of Malaria Eradication Program, NWFP with respect to their health.

Results and Discussion

The information collected revealed that no separate records of pesticide poisoning maintained by the health centers. Whereas, records indicates accidental/suicidal cases. The 408 poisoning cases were recorded. Of these 206 were accidental and 243 suicidal. Total number of deaths due to suicidal poisoning was found to be 63 from 243 suicidal attempts. Whereas, survival rate was hundred percent in accidental poisoning cases. Similarly a study was conducted at the intensive care department of the Jinnah Postgraduate Medical center in Karachi. Between January 1976 and December 1985, a review of 755 cases organophosphate poisoning was carried out. From all 755 cases of acute poisoning admitted to hospital, 39% were due to poisoning with organophosphate insecticides. Out of these case (63.5%) had tried to commit suicide, and 265 were accidental. The cases organophosphate poisoning was associated with a significantly higher mortality rate than other cases of poisoning. From the 105 patients who died due to poisoning in 10 years 73 (67.6% were due to organophosphate insecticide poisoning (Jamil, 1989). Another study was carried out in the Nishtar Hospital in Multan, from January 1 1986 to December 86. In this period 112 patients with acute poisoning were admitted. Out of these cases 75% due to poisoning with insecticides, 13% were due to poisoning with narcotics tranquilizers and the remaining 12% were due to poisoning with other toxins. The mode of poisoning was mainly accidental. Three persons died in this period (Chaudhry *et al.*, 1992). In this study the maximum number was reported from Mrpurkas (28) and the second highest was from Ayazabad, Multan Districts (18) followed by Bhawalpur (15) and Lodran (14). The total number of suicidal cases are 243 the maximum number is from Abbasi Shaheed Hospital, Karachi. Followed by Larkana. Total number of death due to suicidal poisoning is 63. Accurate analytical procedure for monitoring of Pesticide poisoning are not available in hospitals, even in the Government Chemical laboratory, Lahore as no case of pesticide poisoning was retrieved from the available record. Similarly no case of pesticide poisoning was registered in 21 BHU. Whereas in 13% BHU no facility was available to treat poisoning cases and patient referred to district hospital in emergency.

Accidental poisoning cases were reported to be highest during Cotton spray season. Lack of knowledge, inadequate precautionary measures and improper storage conditions were regarded as the major causes of accidental exposure to pesticides. Whereas, recurring high values of intentional

(suicidal) poisoning suggest that social/economical problems are main causes for death. Similarly the suicide was regarded as the leading cases for pesticide poisoning in Indonesia, Malaysia. Sri Lanka and Thailand (Jeyaratnam *et al.*, 1987). Poisoning cases other than pesticide was reported due to alcohol, tranquilizers and datura. Generally Hydrothropy was found to be the main treatment given in case of emergency to poisoning cases, followed by medicine like atropine, decadron, drip, antibiotic and niktamide.

During survey it was observed that the dealers/sellers do not obey the rules and regulations. They sell highly toxic pesticides in open atmosphere/market. They even sell banned pesticide in their grocery shops. Besides their main shops they also sell pesticides in "Khokas" (Wooden cabin) at different places. Some times uneducated persons and children run the business. Such shops were also observed in other cities of the country, In the market even DDT and BHC in polythene bags were seen.

In NWFP most of the dealers/sub-dealers sell DDT, diehdin, BHC etc. These were the old stocks smuggled from Afghanistan and probably from Central Asian states. Sometime these cabin and other shops were found among the fruit and vegetable markets. Similarly damaged spray pumps were also available on rent to the farmers. Locally prepared mixture of pesticides were also available at different places on the roadside and in the markets. DDT and BHC were found to be mix with flour bits as rodenticide.

The workers of Malaria Control Programs were found to be at high risk because they were exposed to pesticide during spray. Workers complained about headache, blurred vision, vomiting etc. This exposure is of biological significance could be determined by duration, dose. Method for the study of routine worker pesticide exposure could be utilized as valuable adjuncts to illness investigation. One of the important factors contributing to accidental acute pesticide poisoning was malfunctioning spray equipment which resulted in contamination to the worker's skin surface with pesticide reported by Dr. Seema Tahir, National consultant on human health effect of pesticide in "Policy and strategy for rational use of pesticide" FAO/UNDP/PK-002.

Lack of training and carelessness are major causes of accidental poisoning. These extreme exposure are also of very limited help in evaluating workplace exposure. Pesticide products when accidentally or intentionally used as agent of suicide or suicidal gesture usually involved extremely large exposure and patterns of use that bear no relationship to their expected use as pesticides. Due to uncertainties about dose and time such case usually contribute relationship with pesticide and other chemical under these circumstances of extremely high exposure are termed as poison.

It is concluded that workshops should be organized to educate farmers and others associated with pesticide business. A comprehensive information on the perception of farmer on health effect of pesticide and descriptive epidemiological data on acute pesticide poisoning should be reviewed/generated. The baseline information collected from this study could be used to design appropriate community health awareness interventions that will improve farmer's knowledge and use of pesticides for their

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health and environment. Moreover, all emergency drugs and antidote should be made available at all Basic health units specially those located in cotton growing area of Pakistan.

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