

Profile of acute poisoning by agricultural and horticultural chemicals in ICU, at Pravara Rural Medical College, Loni

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Abstract

A four-year retrospective study was carried out in which all patients of acute poisoning admitted to Pravara Rural Hospital, Loni during the period: January 01, 2002 to December 31, 2005 were included. A total 1856 patients were admitted to Intensive Care Unit (ICU) of which 385 (20.7%) patients were due to acute poisoning, of these, 312 (81.0%), were due to agro & horticultural poisons. In 13.8 % of the cases identity of the poison could not be ascertained. Organophosphates were the most commonly misused poison irrespective of age, sex and seasons. Both hospitalizations and deaths occurred more frequently in males and incidence was highest in the age group of 21 to 35 years. The study highlights the problem of poisoning in the region. Since the majority of cases of poisoning are from low socioeconomic status, poisonings from agricultural and horticultural chemicals are an important public health problem. Preventive efforts need to incorporate the fact that many serious cases, such as organophosphate poisonings are suicidal in nature.

Keywords: *Agricultural and Horticultural chemicals, Organophosphates, farmers, self-harm, suicide.*

Introduction

In India acute poisoning by different chemicals/pesticides represents an important problem. The incidence of poisoning by pesticides especially by organophosphate is a major problem. According to existing reports, it is estimated that about 15 to 30% people die every year as a result of intentional, accidental and occupational exposures[1]. Poisoning by pesticides represents a public health problem in many other countries in the world, especially in those with an agriculture-based economy. Global estimates prepared by WHO in the past indicated that the problem was large, affecting mainly the developing countries, and that it required urgent attention. However, controversy exists nowadays about the real extent and severity of the effects of pesticides on human health. Some of the statistical data reported and the associated conclusions have been based on numbers of limited comparability and should not be considered as

representative of other countries and regions. Significantly sound, up-to-date evidence of the magnitude of the problem is essential for planning promotion of safe use of pesticides and reducing their adverse effects on health.

Self-poisoning causes a large majority of deaths and immense strain of pesticide poisoning is put on hospital services particularly in Asia. In 1990, Jayaratnam estimated that self-harm resulted in 2 million cases each year with 2-lakh deaths[2].

This study has been aimed to determine the various parameters of poisoning such as type of poison involved, outcome of poison, the most vulnerable sex and age group, seasonal variation if any.

Aims & Objectives

To analyze the trends of poisoning along with various parameters such as type of poison used, seasonal variations, the more vulnerable sex, age group, and outcome of the poisoning.

Materials and Methods

Retrospective data on acute poisoning cases admitted in ICU of Pravara Rural Hospital, Loni during the period of Jan. 2002 to Dec. 2005 were included in this study. Cases of food poisoning, alcohol intoxication, plant poisons and animal bites and stings were excluded.

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Children were grouped into ages 0-12, age 0 being children who had not yet had their first birthdays.

Some abbreviations like AHC, OTAHC, UK, OP, and OI have been used to present results. AHC: Agro & Horticultural Chemicals, OTAHC: Other than Agro & Horticultural Chemicals, UK:Unknown if used where identity of the poison could not be ascertained, OP: used to define Organophosphate compounds, O- OC: Organochlorine compounds and OI for Other Insecticide Groups.

Generally determination of mode of poisoning is a difficult task since neither the police nor relatives of patients provide correct information. Identification of the poison is based on the history, and information provided by the patients, their relatives and the police.

Results

Trends of admission of acute poisoning cases in ICU of Pravara Rural Hospital, Loni was random trend during the period : Jan. 2002 to Dec. 2005. A total 1856 patients were admitted in Intensive Care Unit (ICU) of Pravara Rural Hospital, Loni of which 385 (20.7%) patients were admitted due to acute poisoning. Out of 385 cases of acute poisoning, 312 (81.0 %) cases were due to Agro & horticultural poisons followed by 13.8 % of cases where identity/diagnosis of poison could not be ascertained (Fig-1).

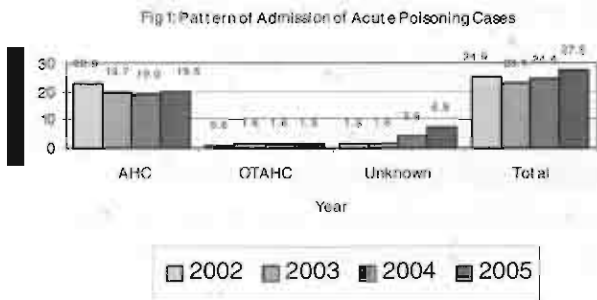


Fig 1: Pattern of Admission of Acute Poisoning Cases.

The cases of poisoning due to organophosphate compounds (OP) showed decline trend while increasing trends observed for cases where the insecticides were responsible for acute poisoning other than organophosphate compounds (Fig-3).

The majority (61.8%) of the victims were young aged between 20 to 40 years. Males were preponderant and aged between 21 to 30 years, followed by females aged 21-30 years. Females between 13-20 years of age were more affected than males aged 13-20 years (Fig-2).

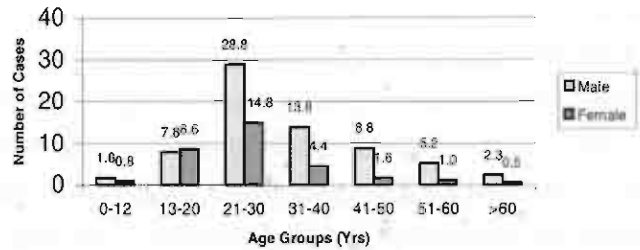


Fig 2: Age & sex wise distribution of cases

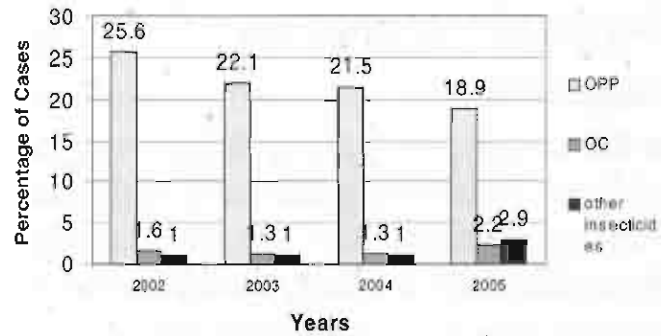


Fig 3: Patterns of Acute Poisoning of Agrochemicals

The cases of poisoning due to organophosphate compounds (OP) showed declining trends while increasing trends were observed for cases where insecticides were responsible for acute poisoning other than organophosphate compounds insecticides were responsible for acute poisoning other than organophosphate compounds (Fig-3).



Fig 4: Seasonal Variation

Monthly variations in numbers were found in hospitalization due to poisoning. It was observed that more patients of acute poisoning were admitted in the months of May and October (Fig-4).

The result of the study also showed seasonal variation in admission of poisoning cases. The maximum number of cases were reported during summer (March to May), followed by spring (Sept. to Nov.), while minimum number of cases occurred in winter (Dec. to Feb.) (Fig-5). The average annual mortality rate due to poisoning in this hospital during the four years of study was 11.25%.

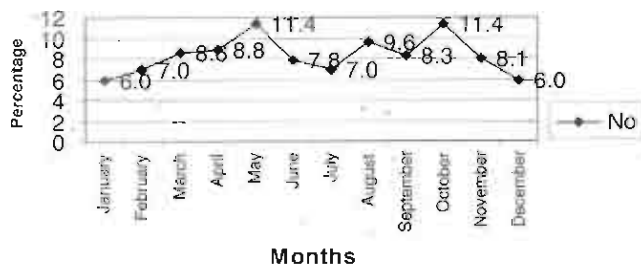


Fig 5: Pattern of Poisoning Cases

Discussion

Pesticides are used extensively for horticultural and agricultural purposes. Increase in population is equal to proportional increase in food production. The whole of humanity owes a debt of gratitude to scientists for development of agricultural and horticultural chemicals, which protect crops against damage caused by pests and diseases. The increasing numbers of medical emergencies due to pesticide poisoning is a very big problem in society. Self-poisoning by deliberate overdose of pesticides, accounts for 20.8% of all acute medical emergencies. Once such patients reach hospitals, few of them die. Most are rendered first aid and stomach wash, and through some of them are then sent home, others discharge themselves from the casualty/emergency department; many are admitted to Intensive Care Units (ICU). Patients may have taken these pesticides on impulse, perhaps after a family or marital quarrel, failure in examination, disappointment in love affair or inability to bear financial burden. These patients are a very high-risk group with respect to suicide. In India and other developing countries the overall suicide rates are increasing and increasingly more young men as well as women in the age group of 21 to 30 years are killing themselves. Social and economic factors are of great importance in contributing to suicide and research carried out by different workers has shown that people who are socially isolated or fear isolation are at major risk. Among pesticides, organophosphate compounds are the most commonly used suicidal poisons. As per WHO statistics, three million people around the world consume these compounds annually, resulting in a staggering more than 50,000 deaths every year[3].

The result of the present study showed that the peaks of poisoning admission are during summer months (March to May), followed by spring (September to November), and lowest in the winter. This is probably due to socioeconomic reasons like monsoon dependent cultivation practice, agricultural based economy, loss of

crops, exorbitant rates of interest and indebtedness to private usury, inability to meet increased financial burden due to marriages of children, failure in examination etc. These findings differ slightly with the findings of Batra et al 2003; who found maximum cases being admitted during the mid-monsoon months of August and September and the lowest numbers of cases being admitted were in the month of January similar to our findings[4].

The number of male victims were more than females, this fact could be attributed to the fact that males are more exposed to stress and strain associated with family, financial burden and job. The majority of victims were young, which can be explained on the basis that this is the most active period of life with an increased tendency to take risks and commit acts of passion. The results of other studies too report a similar pattern[4-6]. Other studies conducted by different researchers in rural parts of South Asia reveal that organophosphate compounds are the most common poisoning agents[4-5]. The mortality rate due to poisoning in various studies[4-6] is reported to be between 11% and 34%, whereas it is 11.25% in our study, while in developed countries, it is 1% to 2%. The morbidity and mortality in any case of acute poisoning depends upon a number of factors, such as, the nature of poison, the dose consumed, knowledge of the local population regarding poisonous properties of substances, availability of adequate medical facilities and the time interval between consumption of poison and administration of proper medical aid and provision of medical help. Poisoning is the fourth most common cause of mortality in rural India[14]. In North India Aluminum phosphide is most commonly misused while in our study organophosphate poisons is the chief culprit[6].

From our study it may be concluded that the male sex, young age, summer season and rural residence (mostly within low socio-economic class) are at a high risk for poisoning. Poisoning is a preventable non-random event and developing effective prevention strategies can help reduce its impact on the health of the general rural population. Incidence of insecticidal poisoning can be especially reduced by strict control of sales, distribution and storage by suitable legislation and by carrying out mass awareness campaigns.

Developing satisfactory interpersonal relationship through proper scientific counseling can check the high incidence of poisoning in the young and married

population by way of effectively tackling the social, marital and psychological problems. Apart from first aid facilities, poison control centers should be set up and provisions for manpower made at PHC level, as prompt and immediate treatment can help save lives in many cases. Apart from medical efforts, social efforts in the form of governmental and non governmental organizations and other social groups should provide help through sincere work at many levels like economy, poverty, agriculture, irrigation and markets. The fundamental dictum being "prevention is better than cure", most of the deaths due to poisoning can and should be prevented or at least reduced by drastic and combined efforts of all concerned.

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