



AGRICULTURE

# PESTICIDE POISONING AMONG AGRICULTURISTS OF DHARWAD DISTRICT: A STUDY

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## Abstract

Pesticide poisoning cases between 2003-2009 have been surveyed to understand the pattern of poisoning cases among farmers of Dharwad district. Total 39 poisoning cases were studied from OPD (Out Patient Department) to IPD (In Patient Department), followed from admission to recovery or death in a systematic manner. All these cases were analyzed with an objective of knowing age distribution of victims, commonest type of poisoning, the manner of poisoning, and also the rural and urban trends. Among 39 cases, male 31 cases (79.48%) predominated females 8 cases (20.51%) with majority (41.02%) belonging to 41-50 yrs age group. The commonest poison encountered was the Organophosphorous compounds (48.71%). Suicide (79.48%) was the commonest manner than accidental poisoning. Agricultural farmers with rural background, belonging to lower socio-economic strata were the commonest victims (79.48%) compared to others.

**Keywords:** Poisoning cases, Organophosphorous compounds, Suicide, Farmers, Agricultural

## Introduction

Agricultural workers who constitute nearly three quarters of the labour force in the poorest countries (1) of the world use pesticides to protect their crops, at least a third of which have been claimed to be destroyed by pests (2). However, use of pesticides presents important hazards to human health: acute poisoning occurs when toxic reactions follow shortly after exposure, while chronic poisoning occurs when the reactions appear gradually after prolonged exposure (3). Easy availability and low cost of hazardous chemicals plays a major role in both accidental and suicidal poisoning in developing countries like India, Srilanka, South Africa etc (4, 5, 6, 7, 8). Most of the fatality rate is of intentional poisoning by organophosphorus (OP) compound which has been reported from southern and central India (9, 10, 11). According to WHO more than three million poisoning cases have been reported out of which 251,881 deaths occur world wide annually, of which, 99% of fatal poisoning occur in developing countries, predominantly among farmers due to various kinds of poisoning, including poisonous toxins from natural products (11; 12). Therefore, an alarm for early diagnosis, treatment and prevention is crucial in reducing the burden of poisoning related injury in any country. In this regard the present investigation was undertaken to study the pattern of pesticide poisoning cases among the farming community of Dharwad district, Karnataka, India

## Materials and Methods

A total of 39 poisoning cases admitted at Dharwad district of North Karnataka were analyzed during 2003-2009. The victims were studied from the time of OPD admission to wards and followed up till recovery or death. Data were collected in a proforma, from the history given by the patient, hospital records, police inquest reports, post mortem reports, FSL reports and also personal interview with the victim's relatives. Information was collected into a proforma on the type of poison consumed, incidence on age and sex, marital status, religions, hospitalization days were noted from records for each case and analyzed.

## Results

Among 39 cases of poisoning studied during 2003 - 2009, majority of the victims were in the age group of 41-50 (41.02%), the commonest type of poison (48.71%) encountered was organophosphorus compounds (Table. 1).

The commonest manner of poisoning was suicide both in males and females (79.48%) followed by accidental poisoning accounting for 10.25% in male and female respectively. Not a single case of homicidal poisoning was observed in our study. Most of the victims belonged to rural area i.e. 31 (79.48%) in comparison to urban area (20.51). Persons of low socio-economic strata are the commonest victims (66.66%) followed by middle class (23.07 %) and upper class (10.25%) least involved (Table 2).

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## Discussion

The present scenario of globalization, urbanization and industrialization is creating lot of stress on individuals in particular as well as on the society in general. Persons who are not able to sustain these stressful situations are the major victims of either suicidal or accidental poisonings.

Males outnumbered the females and majority were in the age group of 41-50 yrs (41.02%). This particular age group is the most active phase of life for men who are involved mentally, physically and socially in agriculture. They are exposed to day-to-day stresses of life than females. This observation is consistent with previous studies (13, 14, 15).

Table 1: Shows age wise, common type of poisoning distribution among the victims (agriculture farmers) of Dharwad district.

Age	No. of patients	Poison	No. of Cases
0-10	0 (0)	OP compounds	19(48.71)
11-20	1(2.56)	Diazepam	6(15.38)
21-30	4(10.25)	Rat poison	8(20.51)
31-40	8(20.51)	Barbiturates	4(10.25)
41-50	16(41.02)	Alcohol	1(2.56)
51-60	9(23.07)	Phenol	1(2.56)
61 and Above	1(2.56)	Total	39(100)
Total	39(100)		

The values in the parentheses indicate percentage distribution

Table 2: Shows manner of poisoning, affected areas and socio-economic status of poisoning distribution among the victims (agriculture farmers) of Dharwad district

Manner	Victims	Areas	No of patients	Economic Status	No of Cases
Accidental	4(10.25)	Rural	31(79.48)	Lower class	26(66.66)
Suicidal	31(79.48)	Urban	08(20.51)	Middle class	9(23.07)
Unknown	4(10.25)	Total	39(100)	Upper class	4(10.25)
Total	39(100)			Total	39(100)

The values in the parentheses indicate percentage distribution

The commonest poison observed was the organophosphorus compounds and least encountered was the phenol. This is consistent with the observations made by earlier studies. Suicide being the commonest manner of poisoning (79.48%) with residing in rural setup belonging to lower socio-economic strata (66.66%). These observations are similar to the other earlier workers (15, 16). This is possibly due to illiteracy and poverty of the agricultural farmers residing in rural parts. They solely depend on the agricultural income for their livelihood. Due to some reason (i.e. either lack of water or flood) if they are not able to generate the required income for their day to day living and commitments, they may get frustrated and resort to suicide by these agricultural insecticides, pesticides or weed killers which are available in their backyard.

Poisons may enter the body through different routes. The rapidity of action of a poison depends upon the route of administration, the rate of absorption and the mode of action in which it is introduced in to the system. In order of rapidity of action, the routes are as follows; Inhalation in gaseous or vaporous form (During spraying of insecticides in the field, if proper precautions are not taken, then OPC in vaporous form can be inhaled with inspired gas); injection into the blood vessels; intramuscular, subcutaneous, intra dermal injection; application to an open wound

(handling OPC insecticides with bare handed, when there is open wound in the user's hand); application to a serous surface; application to bronchotracheal mucous membrane; introduction into stomach (when ingested for suicidal purpose); Introduction into natural orifice- rectum, urethra, vagina (as abortifacients, village dais sometimes use OPC, datura, ergot, coleopteris, madar, yellow oliender etc); application to unbroken skin (OPC, nicotine, phenol and its derivatives, etc).

The incidence, trends of poisoning, the morbidity and mortality due to poisoning can be possibly curtailed by following a. Strict vigilance over the sale and distribution of insecticides/pesticides. b. Educating the users regarding the safety measures. c. Good treatment facilities (i.e. antidotes etc) at rural areas like P H C's and P H U's. d. Establishing poison information centers of schools and hospitalize at multi places. e. Proper and correct implementation of social and economic projects aimed for upliftment of the rural poor and downtrodden.

## Conclusion

The study clearly highlights the profile of poisoning in Dharwad District of North Karnataka area, showing that the males of 41-50 yrs age group are the major victims. It also points towards the commonest poisoning used i.e. Organophosphorous compounds to

commit suicide by agricultural farmers of rural area belonging to lower socio-economic strata.

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