

Clinico-epidemiological Profile of Organophosphorus Poisoning at Provincial Hospital, Janakpur, Nepal

Sanjeet Kumar Jha^{1*}, Divyanshu Jha², Manish Panday¹, Mahesh Mahaseth¹

¹Department of Internal Medicine, Provincial Hospital, Janakpur, Province-2, Nepal,

²Ex-medical officer, Department of Health, Nepal

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*Correspondence:

Dr. Sanjeet Kumar Jha
Provincial Hospital
Janakpur, Nepal

E-mail:

jhasanjeet0@gmail.com

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ABSTRACT

INTRODUCTION: Organophosphorus is one of the most common causes of poisoning worldwide. Organophosphorus (OP) poisoning is a major public health problem in Nepal. This study was conducted to observe the epidemiological pattern and mortality in patients with OP poisoning admitted to provincial hospital Janakpur, Nepal. **MATERIALS AND METHODS:** It was a retrospective study. All the consecutive poisoning cases due to OP compound admitted through emergency either in the ward or ICU of the provincial hospital from 15 May 2020 to 15 November 2020 included in the study. **RESULTS:** A total of 160 cases of poisoning were admitted through emergency either in the medical ward or ICU of the provincial hospital. Out of these 81 (51.63 %) was OP poisoning. Among 81 cases 51.85 % were male. 70.37 % of cases were from the young adult group i.e., 15 to 30 years. 38.37 % were housewives. Among all included cases 43.20 % had consumed Methyl parathion (Metacid) followed by Phorate 24.69 %. 55 % of total cases were from Dhanusha district followed by Mahottari and Sarlahi. The mortality rate was 14.81 % of total admitted cases, with an average of 5.7 days of hospital stay in the recovered case. **CONCLUSIONS:** OP poisoning is a major public health problem in province 2. It affects mostly the young age population. Housewives are at more risk of poisoning. The mortality in patients with OP poisoning is high even if antidotes are available. Considering the common occurrence and full curability of the condition early arrival to the hospital, timely monitoring, and prompt management may help to reduce mortality. With strict laws on the provision of pesticide availability, the poisoning incidence can be decreased and by proper development of infrastructure and ICU facility mortality can be decreased.

KEY WORDS: Organophosphorus, Poisoning, Pesticides.

INTRODUCTION

Organophosphorus (OP) compounds are used as a pesticide, herbicides, chemical warfare agents and therapeutic agents as ecotiopate for the treatment of glaucoma [1,2,3,4]. Poisoning is one of the common causes of admission of young adults in Nepal [5,6]. OP poisoning accounts for about 80% of the total pesticide-related admissions [7,8]. Case fatality is 5-20% in Asian developing countries like Nepal where agriculture is the main source of total GDP [9]. Poisoning is one of the common means of suicide in Nepal. OP compounds are easily available for purchase in developing countries like Nepal.

The objective of this study was to determine the socio-economic pattern of OP poisoning and to find the outcome of OP poisoning in terms of survival and duration of hospital stay.

MATERIALS AND METHODS

Study design and setting

A retrospective observational study was conducted at Provincial Hospital, Janakpur, Nepal from 15 May 2020 to 15 November 2020. All the OP poisoning cases admitted to either the department of medicine or Intensive Care Unit of Provincial Hospital included in the study.

Participants and study procedures

Data was collected from medical records of patients with poisoning. There were 160 cases of poisoning admitted through the emergency department of provincial hospital. Only 81 out of these fulfilled the inclusion criteria and were included in the analysis. Patients below the age of 15 years and patients poisoned with other compounds were excluded. The diagnosis was made based on a definite history of ingestion of OP compound and clinical features suggestive of OP compounds. Most of the time patient-party brought the container. If the compound consumed is unknown, patients were screened through an atropine challenge test. Patients who tested

positive were classified as organophosphorus poisoned. Resources for cholinesterase levels were not available at the hospital. The characteristic manifestation of OP compounds was noted and for other compounds, the diagnosis was solely dependent on information provided by the container or patients or their relatives.

Statistical consideration

The data collected was entered in MS Excel and statistical analysis was done. Univariate analysis was carried by calculating the frequency and percentage. Furthermore, mean, median and standard deviation were calculated.

RESULTS

Out of 160 cases, only 81 (50.63%) had OP poisoning, confirmed either by definite history or container or clinical features and atropine challenge test. OP poisoning was attributed main to Methyl parathion 35 (43.20%) followed by Phorate 20 (24.69%) and Chlorpyrifos 15 (18.52%) Table-1.

Table 1 Types of OP compound consumed (N=81)

Op compound	Number of patients	Percentage (%)
Methyl Parathion	35	43.21
Phorate	20	24.69
Chlorpyrifos	15	18.52
Dimethoates	5	6.17
Dichlorvos	6	7.41

Among 81 cases of OP poisoning, 42 (51.85%) were male and 39 (48.15%) were female. 70.37% of total OP poisoning cases were between 15 to 30 years of age. In this age group, there were 28 males and 29 females which were almost equal in numbers. Most of the cases were housewives 31 (38.27%) followed by labor 20 (24.70%), student 13 (16.02%), farmers 8 (9.88%) and others 9(11.13%) Most of the OP poisoning cases admitted were from Dhanusha, Mahottari and Sarlahi district. Accordingly 44 (55%) were from Dhanusha, 26 (32.5%) from Mahottari, 5 (6.25%) from Sarlahi and rest 5 (6.25%) were from other districts and places (Table-2).

Table 2 Socio-demographic characteristic of study subjects (N=81)

Characteristics	Category	Total Number
Gender	Male	42 (51.9%)
	Female	39(48.1%)
Age in year	15-30	57 (70.4%)
	31-45	15 (18.5%)
	46-60	4 (4.9%)
	>60	5 (6.2%)
Residence	Dhanusha	44 (54.3%)
	Mahottari	26 (32.1%)
	Sarlahi	5 (6.2%)
	Others	5 (6.2%)
Occupation	Labor	20 (24.7%)
	Farmer	8 (9.9%)
	Students	13 (16.0%)
	Housewife	31 (38.3%)
	Others	9 (11.1%)

Table3 Outcome of hospital stay

Age (in years)	Recovered	Referred	Expired
15-30	44	3	10
31-45	12	1	2
46-60	4	0	0
>60	5	0	0
Total	65 (80.25%)	4 (4.94%)	12 (12.81%)

Among 81 OP poisoning cases, 65 (80.25%) recovered while 12 (14.81%) expired who were mainly from the young age group of 15 to 30 years and 4 (4.94%) were referred, either on patient party request or due to unavailability of intensive care (Table-3). Death among the age group of 15-30 years contributed 83.33% (10) of total death that occurred i.e. 12. Also 66.67% (8) of the total death was of females (Figure 1).

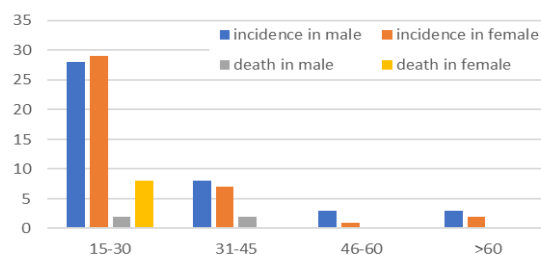


Figure 1 | Incidence and mortality by age and gender

DISCUSSION

The retrospective study underlines that OP compounds are the most common pesticides used for self-poisoning [10,11]. Different studies on OP poisoning show female predominance in South Asian countries [6,7,8,9,10]. This study revealed a higher incidence of poisoning in males (51.85%) with a ratio of 1.08:1. Based on their

occupation, housewives (38.27%) were the most affected, followed by labor, students and others. This finding varies from other similar studies [6,11,12,13,14,15]. In this study, the mortality rate of 14.8%, is in accordance with the results of various studies done in Nepal, with a mortality rate ranging from 7.4 to 13% [13,14,15,16].

CONCLUSIONS

Organophosphorus poisoning is a major public health problem in Nepal. It affects mainly young population. Females especially housewives, who has to deal with many responsibilities are at higher risk of OP poisoning. There should be strict law regarding buying, distributing and marketing, so that poisoning incidence and mortality can be decreased. This

study highlights the need to establish a poison information center to provide systematic awareness about the OP poisoning to young adults and housewives. It can be achieved by systematic studies on OP poisoning and psychological aspects of young adults from lower economic classes.

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Author Contributions: Concept and design: S.K. J, M.P. and M.M; Statistical analysis: S.K.J and D.J; writing of the

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Data Availability: Data will be available upon request to corresponding authors after valid reason.

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