Short Communication

Profile of Methyl Parathion Poisoning in Manipal, India

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ABSTRACT

The main objective of this study was to collect data with regard to the pattern of acute methyl parathion poisoning in this part of the world. One hundred and fifty three patients with organophosphate poisoning presented to Kasturba Hospital, Manipal between January 2001 and December 2002, out of which 58 cases (37.9%) were due to methyl parathion exposure. The commonest reason for poisoning was suicide (98.2%). A significant proportion of victims were male (72.4%), many in the 21-30 years age group (43.1%). In 77.5% of the cases, the poisoning incident occurred during daytime. Manifestations were predominantly muscarinic in nature, and the median value of serum pseudocholinesterase at admission was 2407.5 IU/L. Respiratory failure was the commonest complication (41.2%). 25.8% of the cases ended in death, and 40% of these succumbed within 24 hours of exposure.

Key Words: *methyl parathion, organophosphate, poison, suicide*

Introduction

Organophosphorous compounds (organophosphates) are extensively used as pesticides in agriculture in India. Because of their ready availability, relative inexpensiveness, and rapidity of their lethal action even in smaller doses, they are one of the most widely employed suicidal poisons.[1]

As reported by the World Health Organization (WHO), three million people around the world consume these compounds annually, resulting in a staggering 40,000 deaths every year.[2] In India, they began to be imported from 1951, but very few knew the lethal nature of these compounds for humans till the Kerala food poisoning tragedy occurred in 1958. This tragedy, which took a toll of about hundred odd lives resulted from inadvertent stocking of foodgrains and parathion packages in the same hold in a ship, leading to leakage of the pesticide and contamination of the gunny bags containing the grain.[3] Because of the widespread use of these compounds in agriculture and horticulture in India, either accidental or suicidal poisoning has become a common and serious problem particularly amongst the rural populations. Although extensive data is available in the literature regarding organophosphate poisoning, information relating to the pattern of methyl parathion poisoning is comparatively unrepresented. Therefore an attempt has been made in the present study to find the pattern of methyl parathion poisoning in this part of the world.

Materials and Methods

During a two-year period from the first of January 2001 to 31st December 2002, one hundred and fifty three cases of organophosphate poisoning were admitted to Kasturba Hospital, Manipal, which is a tertiary-care teaching hospital in Karnataka State of South India, out of which fifty-eight cases were the result of exposure to methyl parathion. This comprised the material for the present study.

Detailed information regarding age, sex, manner of poisoning, time of consumption, complications, outcome,

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and duration of survival was gathered from the hospital files obtained from the Medical Records Department of Kasturba Hospital, Manipal. The findings were tabulated and analysed using SPSS Software.

Results

Out of fifty-eight cases of methyl parathion poisoning, the manner of death was suicidal in 98.2% and accidental in 1.8% of cases. Twenty-five victims were aged between 21-30 years (**Table 1**). Males accounted for 42 cases (72.4%), whereas females accounted for 16 cases (27.6%). Most of these cases of poisoning occurred during daytime (**Table 2**). Median value of serum pseudocholinesterase level at admission was 2407.5 IU/L (first quartile-609 IU/L, third quartile- 4496.7 IU/L). Muscarinic manifestations predominated (**Fig 1**). Respiratory failure was the most common complication (41.2%) (**Table 3**). Seven cases demonstrated no complications, and were subsequently discharged. A total of 43 victims survived, while 15 victims died constituting a mortality of 25.8%. Forty percent of the victims died within 24 hours of exposure.

Table 1 Age-wise Distribution of the Victims

Age (in years)	**No. of Cases**	**Percentage**
11–20	7	12.1
21–30	25	43.1
31–40	12	20.7
41–50	4	6.9
51–60	5	8.6
61–70	4	6.9
71–80	1	1.7

Table 2 Distribution of Cases as per Time of Consumption

Time of Consumption	**No. of Cases**	**Percentage**
Day (6.00 AM - 6.00 PM)	45	77.5
Night (6.00 PM - 6.00 AM)	13	22.5

Table 3 Distribution of Cases on the Basis of Complications

Nature of Complication	**No. of Cases**	**Percentage**
Respiratory failure	21	41.2
Cardiovascular failure	16	31.4
Infection	12	23.5
Convulsions	2	3.9
Total	51	100

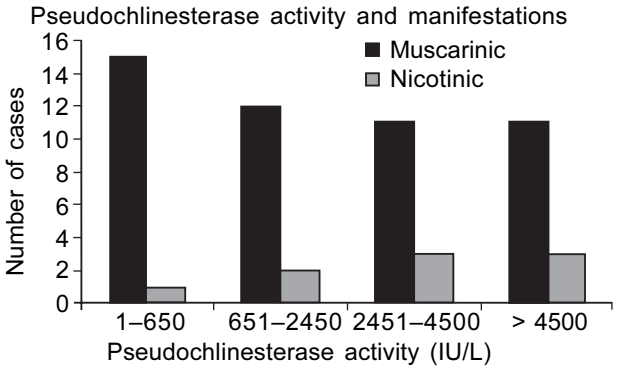

Fig 1

Discussion

In India, organophosphate insecticides are used extensively in horticulture and agriculture. Because of their easy availability, deliberate self-ingestion of organophosphate pesticides is a significant cause of morbidity and mortality. Since there is paucity of literature regarding specific features of acute methyl parathion poisoning, an attempt has been made to compare our findings with those of conventional organophosphate poisoning. The incidence of methyl parathion exposure in the present study was found to be 37.9% of the total number of organophosphate exposures, which is less when compared to the data obtained from a similar study in Nepal.[4] In the majority of the cases, the poisoning was suicidal. This is consistent with other studies.[4,5] In one case, the poisoning was accidental, the person being poisoned while he was spraying the pesticide over the field.

In the present study, it was observed that 21-30 years was the common age group affected, which is similar to some other studies.[4] This age group is probably more vulnerable to the various emotional conflicts which occur during an average person's life. Male preponderance was observed in the present study, which is in concurrence to other studies.[5] The majority of the subjects consumed poison during the daytime. This is probably because an

individual is more likely to be exposed stressful situations during daytime than at night.

With reference to clinical manifestations, those patients in whom serum pseudocholinesterase levels were substantially low suffered more muscarinic symptoms than nicotinic features. In fact, overall, nicotinic manifestations were less commonly seen (15.5%). Respiratory failure is widely recognized to be the most common complication following organophosphate poisoning.[6] It could occur due to aspiration of gastric contents, excessive secretions in the airways, development of intermediate syndrome, pulmonary infection, septicemia, or development of adult respiratory distress syndrome.[7] This is consistent with observations in the present series. Cardiovascular collapse is also possible in organophosphate poisoning due to depression of circulatory center, or as a complication of hypoxia due to respiratory failure.

Seven cases were discharged uneventfully in the present series without any ensuing complications. The over all mortality was found to be 25.8%, which is comparable with other studies.[5,8] Forty percent of the victims died on the first day itself, which is the crucial period that will dictate prognosis. This could occur due to the delay in presenting to the hospital, which emphasizes the need for immediate decontamination of the victim before being referred to a tertiary care hospital.

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