

## Epidemiology and Clinical profile of Pesticide Poisoning in Bangladesh

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### Abstract

#### Introduction:

Due to easy availability, pesticides have become commonly used substance for intentional self-poisoning. According to the World Health Organization (WHO) estimates, around 3 million poisoning cases with 220,000 deaths occur annually. About 99% of these deaths occur in developing countries. According to Bangladesh Health Bulletin, DGHS 1999 poisoning is the 15th common cause of morbidity (n=309409) and 3rd common cause of mortality in 1997 and 2nd common cause of mortality in 1999. The number of accidental, suicidal and homicidal intoxications with OPs is high with vast mortality due to access difficulty for medical treatment and lack of resources in health care facilities. There are too many patients, too few physicians, few drugs and ventilators and not enough good evidence about how to treat patients with the life threatening OP poisoning. The ready availability of potent pesticides in the homes of most residents in rural areas makes OPs the preferred compounds of deliberate self-harm.

#### Materials and Methods:

Over a period of one year between January 2004 to December 2004, victims of pesticide poisoning admitted to one medical indoor department of Dhaka Medical College Hospital, Dhaka were enrolled as per inclusion criteria of the present study. Inclusion criteria were all adult cases admitted in one medicine unit, Dhaka Medical College Hospital, Dhaka following pesticide poisoning. The pts were excluded when diagnosis of any other cause of poisoning like sedatives, kerosene etc. were identified and failure to give consent by patient or party.

The diagnosis was based on history of pesticide ingestion and clinical features by the author herself. The age, sex, marital status, occupation, cause of intoxication, poison consumed, time elapsed between ingestion and admission to the hospital, signs and severity of intoxication on admission, treatment and outcome were recorded on a restructured case record form. During their hospital stay, routine full blood count, serum biochemistry, urine for routine and microscopic examination, chest radiograph were carried out in relevant cases. After giving gastric lavage in emergency department, poisoned patients were admitted to medical indoor department. All patients with suspected organophosphorus compound poisoning were managed with intravenous atropine until satisfactory control of tracheobronchial secretions could be achieved. Mydriasis, systolic BP >100 mm of Hg, heart rate more than 100 /min, dry axilla were other criteria for atropinization. According to conventional regimen atropine was given 4-5 ampoule in an interval of 15 minutes and dose was titrated according to the clinical evidence of flushing, dry mouth, disappearance of sweating, dilatation of pupil and increased heart rate. If such signs were absent the dose of atropine was increased. According to new regimen at first 3 to 5 ampoules was given and then after 3-5 minutes if the five parameters does not improve we double the dose and continued to double each time that there is no response. Once atropinised, we then used 10-20% of the total atropinised dose in infusion every hour. Atropinization maintained for at least 4 to 5 days before withdrawal. Careful clinical monitoring was done .Pralidoxime chloride

was given intravenously (IV) as 1 g bolus at admission and then 8 to 12 hourly in cases of moderate and severe poisoning.

#### Results:

Total patients admitted in the study medical unit of DMCH in the year 2004 were 4378; of them 579 (13.23%) patients died. Out of total admitted cases, 796 (18.18%) were poisoning cases and total death due to poisoning were 37 (6.39%). During the study period total pesticide poisoning cases were 60 (7.53%); Of them 13 (21.67%) died.

More than half (51.7%) of the pesticide poisoning cases were teen-aged (20 or below 20 years of age) The mean age was 23.38  $\pm$  1.16 years and female predominates at presentation to health care facilities.(Table-1).Approximately 57% of the patients were rural residents. More than half (51.7%) of the patients were married. In terms of occupation, 35% were students, 30% were housewives, 15% businessmen, 6.7% farmer, 5% maid-servants.

#### Discussion:

Among the 796 poisoning cases 60(8%) patients used pesticide, 16(2.01%) patients used rodenticide which includes one case of aluminium phosphide poisoning, 8(1.00%) patients used fungicide and 711(89.3%) patients used other substances. There was 37 deaths in poisoning cases amongst which 13 were due to pesticide(OP particularly) which is about 6.39% of total death and 4.65% of total poisoning of cases and 21.70% of pesticide poisoning death, which was consistent with other studies done in Bangladesh<sup>8</sup> and South India. Pesticide poisoning occurred below 30 years of age, which indicates that pesticide poisoning is common among young people. Present findings are in close approximation with the findings of Ahmad et al. (1994) and M.A. Faiz et al. (1998) and male female ratio of 2:3 which differs with the studies done at CMCH but similar to the study of Karki et al. The pesticide poisoning cases have a 1.13: 3 ratio between urban and rural incidence indicating the choice of rural farming community of OPC. The study shows that the incidence of pesticide poisoning was highest among the students (35%).The highest incidence among students reflects that they are the emotionally vulnerable group. The high number in housewives indicates that familial instability may be the underlying cause and it also suggests that pesticide is easily available and reachable within hands. These findings simulate with Karki et al.

#### Limitation of the study:

No ideal or uniform consensus for management of OP poisoning was available. Immediate artificial respiratory support for the victim was not available when required. Financial constraints by the patients and poor logistics and drug availability in a tertiary care hospital. In 50% cases brand of OP poison was not known. Estimation of plasma cholinesterase or RBC cholinesterase was not available to confirm or to assess the Severity of disease. Toxicological analysis of stomach content was not available. Long term outcome of OP poisoning was not possible to follow up.

**Conclusion:**

It can be concluded from this study that acute pesticide poisoning in teaching hospital in developing agricultural country like Bangladesh is a major health problem resulting in a high mortality and morbidity. Prompt recognition, first aid and early treatment should be the corner stone in order to minimize mortality from these potentially lethal compounds. Scientific diagnostic methods are not available in Bangladesh. Treatment is also not standardized and there is a lot of variation amongst professionals. A national guide line should be introduced. Appropriate management of pesticide poisoning requires rapid decontamination, ICU facilities with effective man power and use of readily obtainable specific antidote in the treatment of severe cases.