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CLINICAL PROFILE AND OUTCOME IN AMITRAZ COMPOUND POISONING

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Abstract
Aim and objectives: The study was conducted to evaluate the clinical profile and outcome of amitraz compound poisoning at tertiary care hospital.
Materials and methods: A descriptive longitudinal study carried in the Department of Medicine, Pravara Rural Medical College and hospital for 2-year duration. In the study period 95 cases were evaluated for their clinical presentation, spectrum of poisoning and their outcome.
Results and conclusion: There were no significant difference in incidence of poisoning according to gender in each age group. Most of the poisoning were due to suicidal intention. The mode of exposure was oral in all patients. Mean duration of hospital stay was 3 days and ICU stay was 1 day. Most common clinical feature being vomiting followed by increase in GI motility, bradycardia, dizziness, hypotension and polyuria. Deranged biochemical parameters were rare. Most of the patients Survived. Overall mortality was 3%. Gender is not making any significant effect on mortality.

Keywords: poisoning, amitraz compound, mortality

1. INTRODUCTION

Everyday around the world, almost 700 people die from poisoning and for every person that dies, several thousands more are affected by poisoning. Poisoning occurs in all regions and countries and affect people in all age and income groups. India is an agricultural country and more than 70% of its population is dependent directly or indirectly for the livelihood on various agricultural activities. It is roughly estimated that 5 to 6 person per lakh population die due to poisoning every year. The commonest cause of poisoning in India and other developing countries being organophosphorus poisoning. But now a days due to availability of different pesticides and insecticides non organophosphorus compound poisoning are increasing in the community of which Amitraz is upcoming compound.[1,2]

Amitraz is a pesticide used worldwide on animals and in agriculture. It contains triazapentadiene, which is a centrally acting alpha-2 adrenergic agonist. Amitraz poisoning is fairly uncommon in humans and occurs via oral, dermal or inhalational routes. Only a limited number of case reports of human intoxication have been published and most of them are of accidental ingestion by children.[3] Amitraz is a chemical belonging to the formamidine class

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of compounds. It has acaricide and insecticide properties and is used to control ticks in cattle, sheep, goats and dogs as well as pests in crops. Commercial formulations of amitraz generally contain 12.5–20% of the drug in organic solvents, especially xylene, an aromatic hydrocarbon.[4] Xylene is used as a solvent in most of the preparations. Other solvents include tetrachloroethylene and mixtures of petroleum products containing predominantly aromatic hydrocarbons. The United States Environmental Protection Agency (US EPA) classifies oral amitraz exposure as 'Class III- slightly toxic' and a group C 'possible' human carcinogen.[5] The first human case of poisoning was reported in 1983 though amitraz is widely available in many regions worldwide. This incongruity is probably attributable to under-reporting of amitraz intoxication in remote rural areas, as awareness about amitraz, its toxicity and its management remains poor among physicians. In addition, it is often misdiagnosed as organophosphate/carbamate (OPC) poisoning. A sizeable number of cases of human intoxication with amitraz have been reported over the past three decades.[6]

Lack of a clear and specific protocol for the therapy of amitraz intoxication may make its successfully managed case reports useful and valuable for other clinical practitioners in poisoning departments. When humans are exposed to amitraz, the symptoms and signs result from both xylene and amitraz. Amitraz acts centrally by activation of presynaptic a2-adrenoceptors causing inhibition of noradrenaline release resulting in suppression of the outflow of sympathetic nervous system activity from the central nervous system (CNS). It also inhibits monoamine oxidase (MAO) enzyme activity7 and prostaglandin E2 synthesis.[7] This may cause numerous symptoms varying from CNS depression (drowsiness, coma, and convulsions), to miosis, or, rarely, mydriasis, respiratory depression, bradycardia, hypotension, hypothermia, hyperglycemia, polyuria, vomiting, decreased gastrointestinal motility, and intestinal distension. Xylene on the other hand may cause acute toxic signs such as: CNS depression, ataxia, impaired motor coordination, nystagmus, stupor, coma, and episodes of neuroexcitability.[8]

With this background, present research work was planned to study clinical profile and outcome of acute poisoning due to Amitraz compound.

The study was conducted to evaluate the clinical profile and outcome of amitraz compound poisoning at tertiary care hospital.

2. MATERIALS AND METHODS

A descriptive longitudinal study carried in the Department of Medicine, Pravara Rural Medical College and hospital for 2-year duration.

The study was conducted after the ethical committee approval from the local ethical committee of Pravara Institute of Medical Sciences, Loni, Ahmednagar, by submitting the synopsis mentioning all the proposed study details and necessary protocols.

Sample size- 95

N=(DEF*(1-P)/ [d2/z2 1-alpha*(N-1) +P*(1-P)]

Where N = sample size

P= prevalence of amitraz poisoning

Data collection:

We collected patients' data from patients interview and patients IPD files. Data was included age, gender, mode of poisoning, initial symptoms, time to appearance of initial symptoms, clinical and laboratory findings, management, and prognosis etc.

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Language of interview:
Patients were interviewed according to the proforma given in annexure in the mother tongue of the patient or the language the patient best understands.

Selection criteria of patient:

Inclusion criteria

1. Patient of amitraz compound poisoning admitted in Pravara Rural Hospital, Loni.
2. Patients of age above 12 years and either gender.
3. Patient and patient's parents wherever applicable, willing to give written informed consent for the study.

Exclusion criteria

1. Patient with other compound poisoning.
2. Age <12 years
3. Patients not willing to participate in study.

Study procedure:

1. Informed consent - Written informed consent was taken from study participants patients.
2. Patients were not to be required bear an additional expenditure
3. Study was terminated at the end of the aforementioned time span i.e., 1 September 2020
4. Probable risk to the participants: none
5. Probable benefits to the participants: Additional and systematic care of the participants during the course of their treatment.
6. Privacy and confidentiality: all the private and confidential information of the patients will be handled by the principle investigator.

Investigation
All patients underwent routine blood investigations as mentioned in case proforma.
Laboratory investigations

1. Blood glucose level
2. Complete blood count
3. RFT

Imaging studies

- Chest x ray pa view
- USG abdomen (if indicated)

Electrocardiogram

Statistical data analysis:
Data was collected as per inclusion criteria and tabulated in MS Excel sheet. The data was further analyzed using SPSS software - version 21 with the help of statistician.

3. OBSERVATIONS AND RESULTS

In our present study mean age of patients was 32.40 years while maximum patients were below 30 years of age (50%). 16% patients were above 50 years of age while 34 % of patients were with age range 30-50 years. In our present study maximum patients were female (58 %) while male patients were 42 %. In our present study, maximum patients were students (37%) and farmers (34%) followed by housewife (17%). In our present study, maximum patients' intention was suicidal (86%) followed by accidental (10%) and with alcohol influence (4%). In our present study, 68 % patients stayed in ICU for one day, 23 % for two days while 9% for more than 2 days. In our present study, 30 % patients stayed in

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hospital for one day, 24 % for two days, 22 % for 3 days, 13% for 4 days while 11 % stayed for more than 4 days.

Table 1: Outcome - distribution of patients

Outcome of patients	Number of patients	Percentage
Survived	84	88
DAMA	8	9
Death	3	3

In our present study, 88 % patients survived while 9% DAMA with 3% death.
In our present study, vomiting was seen in 55 % patients, increases GI motility in 23 % patients, bradycardia in 22%, dizziness in 17 %, hypotension in 12 % while polyuria in 8% patients.
In our present study, hyperglycaemia was seen in only 3 % patients

Table 2: Laboratory investigations – Glycosuria

Urine examination	Number of patients	Percentage
Glycosuria absent	92	97
Glycosuria present	3	3

In our present study, **Glycosuria** was seen in only 3 % patients

Table 3: Laboratory investigations – Liver function tests

Liver function tests	Number of patients	Percentage
Normal range	92	97
De -arranged	3	3

In our present study, **LFT were** was dearranged in 3 % patients

Table 4: Laboratory investigations –Kidney function tests

Kidney function tests	Number of patients	Percentage
Normal range	94	99
De -arranged	1	1

In our present study, **kidney function tests** were was dearranged in only 1 % patients

4. DISCUSSION

This study "**clinical profile and outcome of amitraz compound poisoning"** a prospective observational study was conducted in tertiary care hospital in Ahmednagar, Maharashtra for 2 years. In the study period 95 cases were evaluated for their clinical presentation, spectrum of poisoning and their outcome.

AGE AND SEX INCIDENCE
In our present study mean age of patients was 32.40 years while maximum patients were below 30 years of age (50%). 16% patients were above 50 years of age while 34% of patients were with age range 30-50 years. In our present study maximum patients were female 58 %

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while male patients were 42%. Statistically there was no significant difference according to gender in the incidence with respect to each group.

Dash SK et al mentioned that in their study hundred and six cases were admitted to hospital with diagnosis of acute amitraz poisoning. 53.3% of the cases were male with male to female ratio of 1.4:1. Peak incidence was observed in age group 21-30 years (128 cases)[9]

Karki RK, Risal A in their study found that the study sample included 75 males (54.7%) an 62 female (45.3%). The maximum cases were seen during the third decades (32.1%) followed by fourth decade (22.6%).[10]

Ramesha KN et al, Studied total of 136 patients of various poisoning cases. Incidence was more common among males (75.4%) compared to female (24.3%) with a ratio of 3:1. Most cases of acute poisoning presented in the age group between 20 and 29 years (31.2%) followed by 12-to-19-year age group (30.2%).[11]

Kumar SV mentioned in their study that the majority of poison cases were between 21 -30 years of age. There were more male patients than females with 52.15 % and 47.84% male and female, respectively.[12]

In above studies incidence was more common in males than female probably because it also included other poisoning, here we only consider Amitraz compound poison and hence there was no significant difference found in age groups.

Occupation wise incidence

In our present study, maximum patients were students (37%) and farmers (34%) followed by housewife (17%).

Ramesha KN et al in their study found that by occupation, 44.8% of the cases were manual labourers followed by housewives, (13.2%) student (12.5%) farmers and unemployed (10.2%) and businessmen (8.8%).[11]

INTENTION OF POISONING

In our present study, maximum patients' intention was suicidal (86%) followed by accidental (10%) and with alcohol influence (4%)

In all oral ingestion was route of poisoning.

Ramesha KN et al studied total of 136 patient it was found that 77.9 % (106) of cases were of intentional poisoning for suicidal attempt and 22.1% (30) of cases had accidental poisoning.[11]

Karki RK, Risal A in their study found that all the victims had consumed poison orally. In 38 cases, alcohol was taken along with poison.[10]

Most of them consumed knowingly (78.1%) followed by accidental (21.1%).

Singh B, Unnikrishnan B mentioned that most (72%) poisoning were intentional and only 27% were unintentional.[13]

Srivastava A et al mentioned most common mode of poisoning was suicidal (53%) followed by accidental (47%).[14]

The route of exposure was mainly oral.

DURATION OF HOSPITAL STAY

In our present study, 30% patients stayed in hospital for one day, 24% for two days, 22% for 3 days, 13% for 4 days while 11% stayed for more than 4 days.

Maximum duration of hospital stay was 12 days. Mean duration of hospital stay was 3 days.

Ramesha KN et al mentioned their study that Median hospital stay was 4 days. Only 13 patients stayed in the hospital for more than 15 days.[11]

Karki RK, Risal A mentioned most were nn fatal and were discharged from hospital within four days (62.1%).[10]

DURATION OF ICU STAY

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All patients were admitted in ICU. Most patients 67.1% required ICU care for 1 day followed by 23.7% required for 2 days. Mean duration of ICU stay was 1 day.

OUTCOME OF AMITRAZ POISONING

In our present study, 88 % patients survived while 9% DAMA with 3% death. Majority of victims survived and went home well 88 %, overall mortality was 3%

Kumar SV et al [55] mentioned results of study illustrated that a total of 826 patients were hospitalised due to acute poisoning in the hospital of this 10-patient died due to poisoning.

Ramesha KN et al in their study found that Totally mortality was found to be 1.5%.[11]

Zine KU, Mohanty AC mentioned overall mortality was 1.3 % of amitraz compound.[15]

Karki RK, Risal A were mentioned the overall mortality was estimated to be 1.3 % due to amitraz compound poisoning.[10]

GENDER WISE OUTCOME OF AMITRAZ COMPOUND POISONING

Mortality was similar in males and female so gender is not making significant effect on overall outcome

CLINICAL PROFILE OF AMITRAZ COMPOUND POISONING

In our present study, **vomiting** was seen in 55% patients, **increases GI motility** in 23% patients, **bradycardia** in 22%, **dizziness** in 17%, **hypotension** in 12% while **polyuria** in 8% patients.

BIOCHEMICAL PARAMETER IN AMITRAZ COMPOUND POISONING

In our present study, **Hyperglycaemia** was seen in only 3 % patients, **Glycosuria** was seen in only 3 % patients, **LFT** was dearranged in 3 % patients, **Kidney function tests** were was dearranged in only 1 % patients.

Yilmaz HL et al showed initial signs and symptoms were impaired consciousness, drowsiness, vomiting, disorientation, hypotension, bradycardia, hypothermia, hyperglycaemia, glycosuria and polyuria were observed.[16]

Shitole DG et al found that Giddiness and vomiting were the prominent symptoms, next were drowsiness, irritability and respiratory distress. Except hyperglycaemia and glucosuria other laboratory parameters were normal. Unconscious patient's CT showed brain edema. All patients recovered completely.[17]

Chakraborty J et al reported a case of amitraz poisoning. The patient presented in a deeply comatosed state with respiratory destress, bradycardia and mydriasis. He recovered completely within 24 hours with adequate supportive measures.[18]

Limitation of the study

Our study was included patients from only at local rural area level. Small sample size is another study limitation in our study. Our study was only observation based.

5. CONCLUSION

In this study total 95 patients of AMITRAZ compound poisoning were studied. 55 Patients were males and 40 Patients were females. There was no significant difference in incidence of poisoning according to gender in each age group. Most of the poisoning were due to suicidal intention. The mode of exposure was oral in all patients. Mean duration of hospital stay was 3 days and ICU stay was 1 day. Most common clinical feature being Vomiting followed by increases GI motility, bradycardia, dizziness, hypotension and polyuria. Deranged biochemical parameters were rare. Most of the patients Survived. Overall mortality was 3 %. Gender is not making any significant effect on mortality.

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