

## Clinical Profile and Outcome of Patients Admitted With Rodenticide Poisoning

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Date of Submission: 13-04-2020

Date of Acceptance: 28-04-2020

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### I. Introduction

Rodenticide poisoning remains a major public health problem in Asian countries.<sup>(1)</sup> It is highly dangerous and people are mostly not aware of its toxicity effect which result in high death rate. Rodenticides includes various compounds ranging from highly toxic compounds requiring just a single dose ingestion like zinc phosphide, yellow phosphorus, sodium monofluoroacetate, fluoroacetamide, arsenic, thallium to less toxic compounds requiring repeated ingestion over a period of time like warfarins, and scilliroside. Rodenticide is available in three different forms in our area, as follows – 1) Powder form - zinc phosphide 2) Paste form - yellow phosphorus 3) Bait form - super warfarins

#### AIMS AND OBJECTIVES:

- 1) To study the clinical profile of patients with different Rodenticide compounds.
- 2) To study the biochemical profile of patients admitted in intensive medical care unit with Rodenticide poisoning.

### II. Materials And Methods:

PLACE OF STUDY: This study has been carried out at the Intensive Medical Care Unit of Govt. Medical College and General hospital, Kadapa, Andhra Pradesh

STUDY PERIOD: 6 months (From March 2019 to August 2019).

STUDY POPULATION: 60

STUDY DESIGN: Prospective Observational study.

#### INCLUSION CRITERIA:

1. Any patient admitted with rodenticide intake.
2. Age of the patients > 13 years.

#### EXCLUSION CRITERIA:

1. Mixed poisons
2. Chronic liver disease
3. Alcohol intake within 24 hours before admission
4. Patients on drugs like anticoagulants, antiplatelets
5. Patients with bleeding disorders
6. Acute diarrhoeal disease
7. Patients with known coronary artery disease

Patients were completely examined, including their history and the necessary investigations like CBC, RFT, LFT, PT/INR, BT, CT.

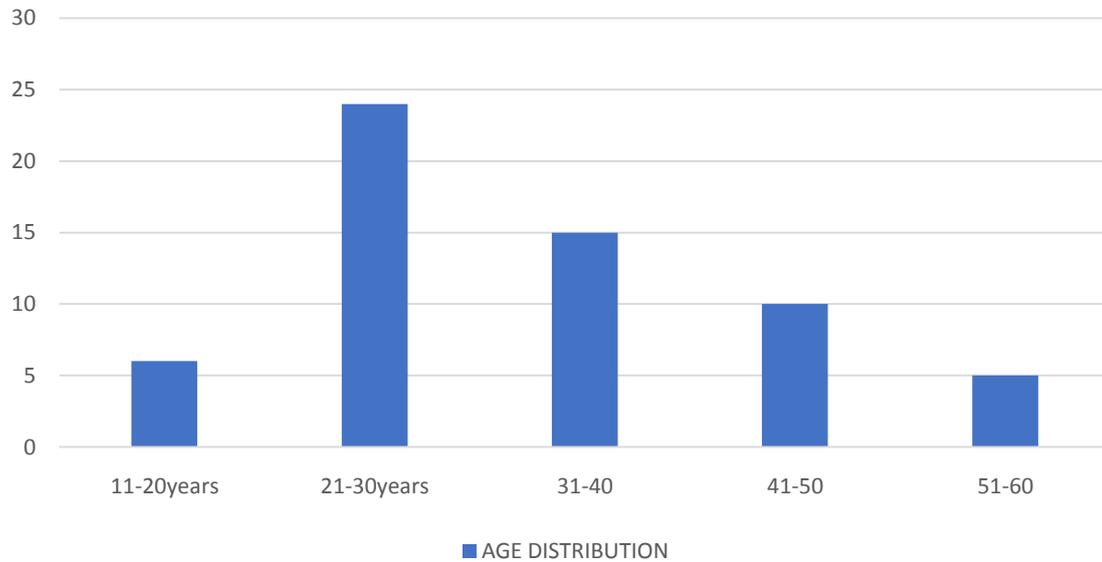
**III. Observation And Results:**

**AGE DISTRIBUTION**

AGE (Years)	11-20	21-30	31-40	41-50	51-60
Number of cases	6(10%)	24(40%)	15(25%)	10(16.6%)	5(8.3%)

Maximum cases (24 cases) belonged to age group 21-30

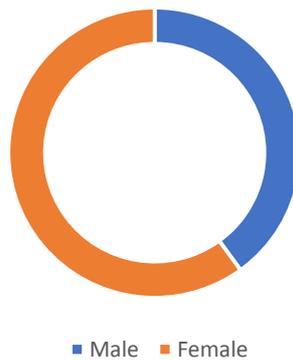
**AGE DISTRIBUTION**



**SEX DISTRIBUTION**

In our study 24(40%) cases were male and 36(60%) cases were female

**GENDER DISTRIBUTION**



MALE	FEMALE
24	36

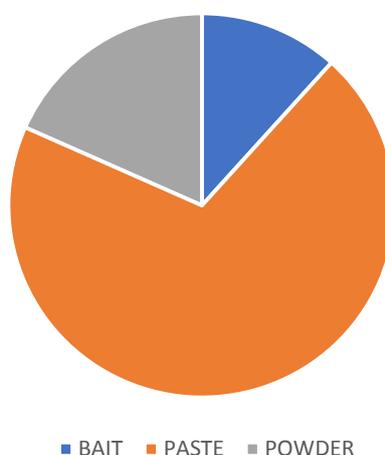
**QUALITY OF INGESTED POISON:**

Out of 60 cases, 7 Patients consumed bait ( 11.7% ) ,42 Patients consumed paste (70.0%),11 Patients consumed powder(18.3%)

BAIT (super warfarins)	PASTE (yellow phosphorus)	POWDER(zinc phosphide)
7	42	11

Yellow phosphorus first presentation of the toxicity is vomiting with abdominal pain. On fourth day patient develops fulminant hepatic failure with bleeding diathesis and renal failure, Zinc phosphide rarely causes cardiomyopathy and ventricular arrhythmias. Super warfarins causes bleeding diathesis.

### INGESTED POISON



### QUANTITY OF POISON CONSUMED

Quantity consumed	5gm	10gm	15gm	20gm	25gm	30gm
Number of cases	18(30%)	17(28.3%)	12(20%)	9(15%)	3(5%)	1(1.7%)

In this study, patient ingested up to 10 g of 35 patients (58.3%), majority being phosphorus compound . 15 to 20 g being 21 patients (35%) and more than 25 g is 4 patients (6.7%) , major being powder (phosphide compound) . even if quantity of poison ingested is less in phosphorus compound , it produces more mortality than other compound , since it is lethal even at dose of 1 mg / kg

### TIME INTERVAL BETWEEN CONSUMPTION OF RODENTICIDE AND HOSPITAL ADMISSION

TIME INTERVAL	NO.OF CASES
LESS THAN 4 HOURS	29(48.3%)
4-8 HOURS	22(36.7%)
MORE THAN 8 HOURS	9(15%)

In this study, it was observed that mortality was higher (91.6%), who had admitted after 4 hours of ingestion, as compared to mortality in patients admitted within 4 hours, which was only meagre (8.3%).

### CLINICAL MANIFESTATIONS:

CLINICAL FEATURES	NO.OF CASES
ABDOMINAL PAIN	54(90%)
VOMITING	29(48.3%)
DIARRHOEA	22(36.7%)
THIRST	20(33%)
JAUNDICE	12(20%)
OLIGURIA	10(16.6%)
BLEEDING DIATHESIS	7(11.7%)
HEADACHE	4(6.6%)

### INVESTIGATIONS:

INCREASED SERUM BILIRUBIN(>1.5mg/dl) ON DAY 4	24(40%)
INCREASED SGOT & SGPT ON DAY 4 (>40IU/L)	24(40%)
INCREASED CREATININE VALUE (>1.5mg/dl)	12(20%)
INCREASED PT/INR/aPtt/BT/CT	7(11.75)
LEUCOPENIA(<4000)	5(8.3%)

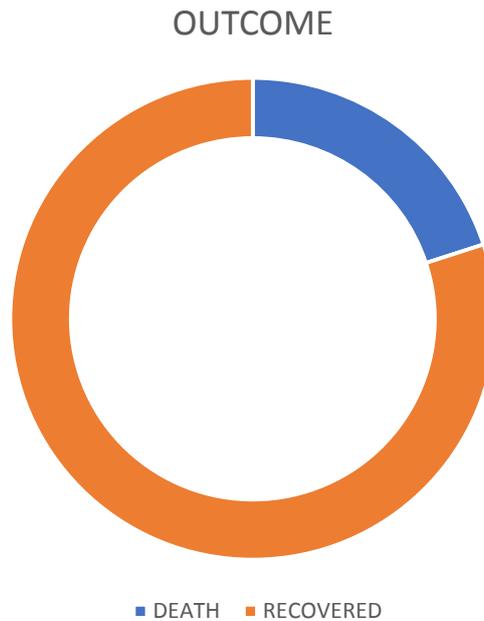
In this study, 24 patients (40%- almost all ingested phosphorus compound) showed elevated serum bilirubin on 4th day of more than 1.5 mg, out of which 12 patients (52.2%) had expired, which also correlate with elevated SGPT values measured on 4th day; indicating the acute hepatocellular toxicity of the phosphorus

compound, measuring more than five times the normal value of SGPT. Serum creatinine was also elevated in 12 patients ingesting phosphorus compound.

#### OUTCOME

All patients were treated supportively, Injection Vitamin K was given for symptomatic patients, Fresh Frozen Plasma was transfused for people with bleeding diathesis. N-acetylcysteine was given for those who developed hepatotoxicity. There is no specific antidote for yellow phosphorus.

Of 60 patients who got admitted, 12 patients expired out of which 6 (16.6%) were female and 6 (24%) were male. All of them had consumed phosphorus (phosphorus) poison.



DEATH	12(20%)
RECOVERY	48(80%)

#### IV. Results

Female to male ratio in our study is 1.5:1. Majority of the patients were in 20 to 30 years age group. Phosphorus compound (paste) forms the major share of poison. Most common symptom is abdominal pain (90%). Bleeding manifestation is common in warfarin group (bait). Mortality in this study was 20%. Increased time delay in hospitalisation carries more mortality. Mortality is seen only in phosphorus compound. Jaundice develops following ingestion of phosphorus, carries most mortality, which also correlates with elevated serum bilirubin and SGPT level.

#### V. Conclusion

Although there are ample studies about individual types of rodenticide, to our best of knowledge, we could not find any other study in the literature that compares the various types. Having said that, we must say the comparative study has yielded few striking facts. Zinc phosphide has a very low mortality and morbidity rate. Super warfarin poisoning produced significant derangement in coagulation parameters. Yellow phosphorus had a significant impact on the patient's outcome. The mortality rate is whopping 50% among the consumed. Rodenticide poisoning, though encountered every day, had so many nuances and intricacies, which became apparent to us after analysing their clinical profile. Indeed, it is a very satisfying experience in a common poison!

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