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Assessment of gross mucosal findings of stomach in cases of fatal poisoning

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Abstract

Background: It has been estimated that pesticides were directly or indirectly is responsible for more than 1 million illnesses worldwide annually. The present study was conducted to assess gross mucosal findings of stomach in cases of fatal poisoning.

Materials and Methods: 72 suspected cases of poisoning of both genders were selected and autopsies were done by routine autopsy procedure with routine autopsy instruments. Findings of external and internal examination were recorded. After opening of thoracic and abdominal cavity, stomach was dissected. Gross examination stomach was done and mucosa appearance as pale, congestion, haemorrhage, erosion, flatten rugae, edema, colour changes were noted.

Results: Common poisoning was organophosphate in 24, organochlorines in 18, aluminium phosphide in 11, carbon monoxide in 8, snakebite in 5, hydrochloric acid in 3 and sulphuric acid in 2 cases. The difference was significant ($P < 0.05$). Gross findings were congestion seen in 26, hemorrhage in 14, erosion in 10, and flatten rugae in 6, edema in 12 and normal in 4 cases.

Conclusion: Most common gross findings were congestion followed by hemorrhage, erosion, flatten rugae and edema.

Keywords: Congestion, hemorrhage, erosion

Introduction

Poisoning is the commonest method adopted in India to commit suicide and 4.6% of accidental deaths were of poisoning in 2014^[1]. (NCRB) Pesticide poisoning is an important cause of morbidity and mortality in many countries in the world. It has been estimated that 95% of fatal pesticide poisonings occur in developing countries like India^[2].

It has been estimated that pesticides were directly or indirectly is responsible for more than 1 million illnesses worldwide annually, and this figure could be just the tip of the iceberg since most cases of poisoning actually go unreported, due to Inadequate Poison Information Centres, Forensic laboratories, and lack of knowledge in utilizing the pesticides, toxicological studies^[3].

After ingestion, most of the poisons are rapidly absorbed throughout the gastrointestinal tract and it is carried to the liver by the portal vein for metabolism and excretion. It is known that most of the compounds are toxic to liver can cause liver dysfunction^[4]. Sometimes diagnosis of poison is also not clear in treatment papers but general treatment of poison is given. In such cases gross findings in stomach mucosa might be of immense help to correlate with history and treatment papers, and making the probable diagnosis of poison^[5]. The present study was conducted to assess gross mucosal findings of stomach in cases of fatal poisoning.

Materials and Methods

The present study comprised of 72 suspected cases of poisoning of both genders. The consent was obtained from all patients' family member. Data such as name, age, gender etc. was recorded. All autopsies were done by routine autopsy procedure with routine autopsy instruments. Findings of external and internal examination were recorded. After opening of thoracic and abdominal cavity, stomach was dissected. Gross examination stomach was done and mucosa appearance as pale, congestion, haemorrhage, erosion, flatten rugae, edema, colour changes were noted. Site involvement of stomach such as cardiac end, body and pylorus stomach and its contents, piece of small intestine and its contents, pieces of liver, spleen, kidney and blood were collected and preserved in saturated solution of common salt. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

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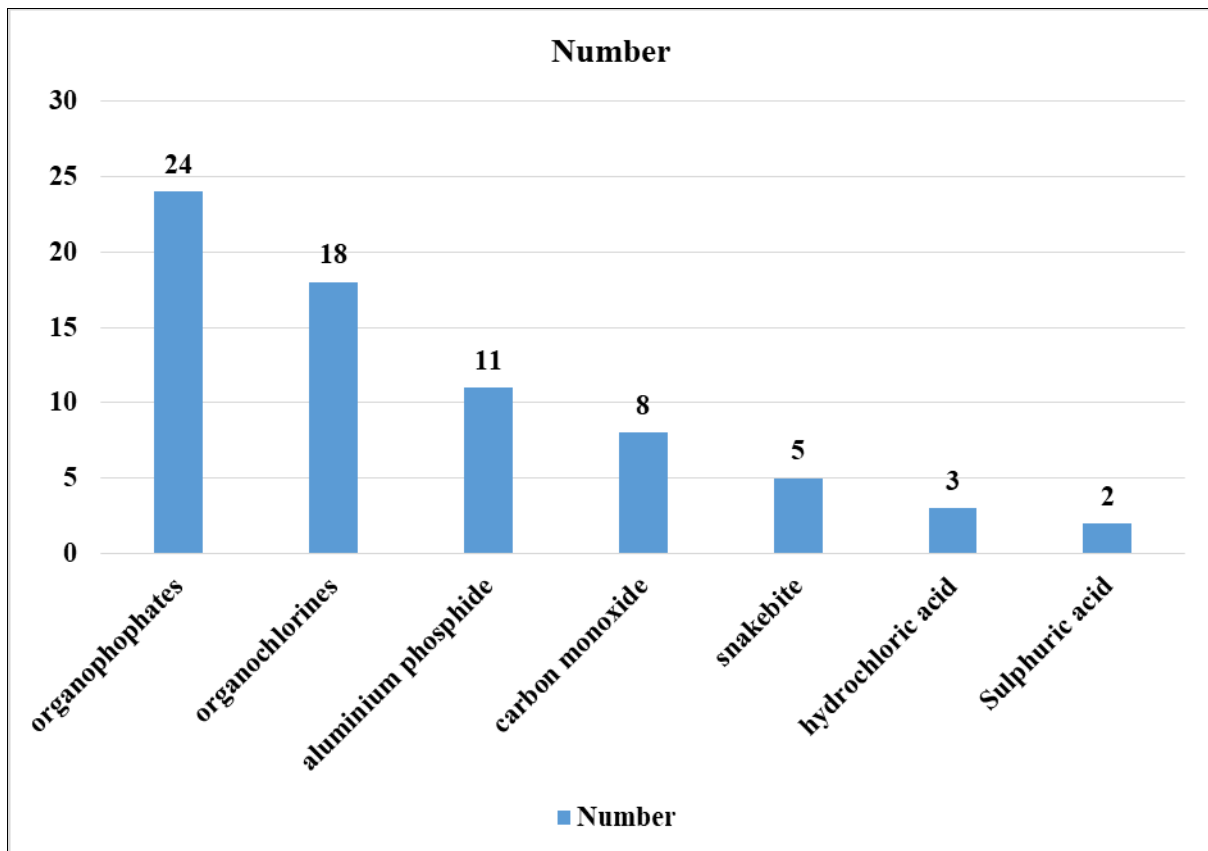
Results

Table 1: Type of poisoning

Poisoning	Number	P value
Organophosphates	24	0.01
Organochlorines	18	
Aluminium phosphide	11	
Carbon monoxide	8	
Snakebite	5	
Hydrochloric acid	3	
Sulphuric acid	2	

Table I, graph I shows that common poisoning was organophosphates in 24, organochlorines in 18, aluminium phosphide in 11, carbon monoxide in 8, snakebite in 5,

hydrochloric acid in 3 and sulphuric acid in 2 cases. The difference was significant ($P < 0.05$).



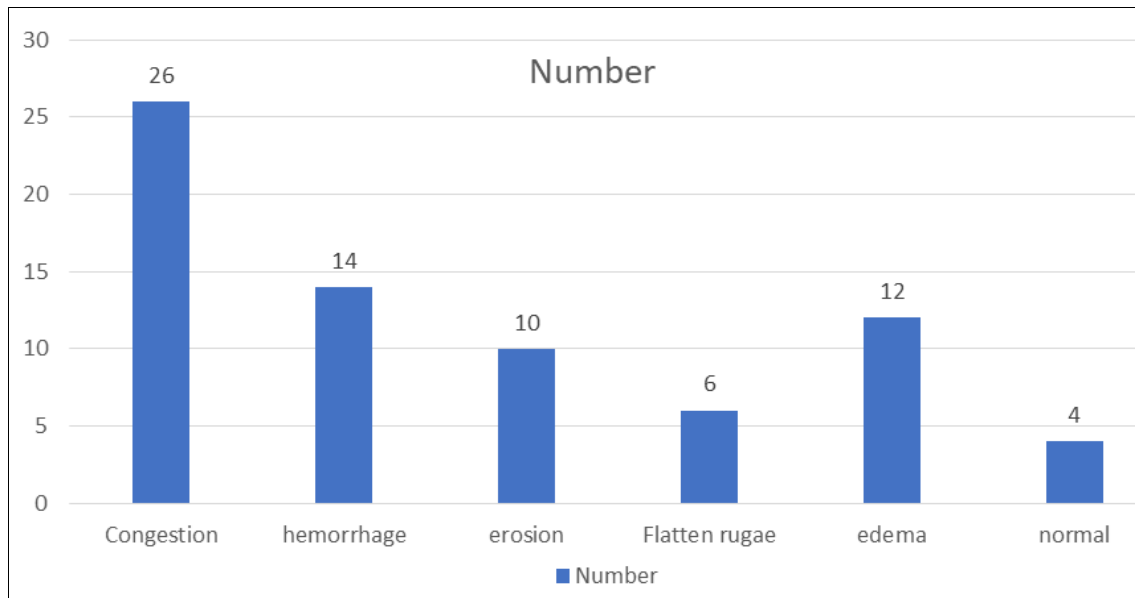
Graph 1: Type of poisoning

Table 2: Gross findings

Gross findings	Number	P value
Congestion	26	0.01
hemorrhage	14	
erosion	10	
Flatten rugae	6	
edema	12	
normal	4	

Table II, graph II shows that gross findings were congestion seen in 26, hemorrhage in 14, erosion in 10, flatten rugae in

6, edema in 12 and normal in 4 cases. The difference was significant ($P < 0.05$).



Graph 2: Gross findings

Discussion

Acute poisoning by Pesticide compounds is a major global clinical problem, with thousands of deaths occurring every year.⁶ Most of these pesticide poisoning and subsequent deaths occur following an intentional self-ingestion of the poison. The potential adverse impact on human health from pesticides exposure is likely to be higher due to easy availability of highly hazardous products^[7]. In developing countries like India major source of human poisoning is through agricultural poisons. The problem is getting worse with time as newer drugs and chemicals are developed in vast numbers^[8]. The commonest pesticides agents in India appear to be organophosphates, carbamates, pyrethroids and aluminium/zinc phosphide^[9, 10]. The present study was conducted to assess gross mucosal findings of stomach in cases of fatal poisoning.

We found that common poisoning was organophosphate in 24, organochlorines in 18, aluminium phosphide in 11, carbon monoxide in 8, snakebite in 5, hydrochloric acid in 3 and sulphuric acid in 2 cases. Balasubramanian *et al.*^[11] included a total of 4123 autopsies amongst 906 cases with the history of agricultural poisoning. In that 535 cases were females and 371 cases were male. Age of the individuals varied from 7 years to 65 years. Amongst 80% of cases was in the age group of 25 to 35 years. Most of the cases are suicidal in nature and 2% are accidental in nature. In 643 cases poisons were confirmed by chemical analysis of state forensic science laboratory, in that 368 cases were organ phosphorus compound, 97 cases were aluminium phosphide and 81 cases were zinc phosphide, 97 cases are Pyrethrin compounds and in remaining cases poison was not detected by chemical analysis. In all cases liver was examined for both gross and histological changes, most cases showed severe congestion by gross examination. Histological changes in liver were classified based on the degree of damage to hepatic tissue caused by agricultural poisonous substance were grouped into I, II & III. Group I include Congestion, sinusoidal dilatation, mononuclear and neutrophilic infiltration, group II include Cytoplasmic vacuolization and hydropic degeneration, group III include Patchy or centrilobular necrosis and patchy haemorrhages. Based on duration of treatment amongst poisoning cases

study group was classified. In that 653 cases were treated for less than 24 hr, 174 cases were treated for 2 – 5 days, 79 cases were treated for 5 – 10 days. Organophosphorus compound was most commonly used and female victims in middle age group were predominant and the histopathological findings were grouped based on the degree of damage to the hepatic tissue and their incidence were identified based on type of agricultural poison and duration of treatment. Group I histological changes were predominantly seen among organophosphorus compound and the persons who were treated less than one day, group II & III changes were predominant among phosphates, Pyrethrin compounds and the persons who were treated more than two to five days.

We found that gross findings were congestion seen in 26, hemorrhage in 14, erosion in 10, flatten rugae in 6, edema in 12 and normal in 4 cases. Aghera *et al.*^[12] in their study conducted on randomly selected 150 cases of poisoning from total autopsies studied gross mucosal findings of stomach, it was divided into three parts namely cardiac end, body-fundus and pylorus. Gross mucosal findings like pale, congestion, haemorrhage, erosion, flatten rugae, edema, colour changes were noted. Haemorrhage and congestion of mucosa were found most commonly, irrespective of type of poison and site of stomach affected. Pylorus and body fundus of stomach were more affected in all cases of poison except ALP poison where cardiac end was more affected.

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