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Original Research

Assessment of cases of Paraquat poisoning in known population

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ABSTRACT:
Background: The present study was conducted to assess cases of Paraquat poisoning in known population. **Materials & Methods:** 58 cases of Paraquat poisoning based on location were classified into grade I as oral or pharyngeal mucosa lesion, grade II as oral cavity combined with focal esophageal lesions, grade III as oral and diffuse esophageal lesions but without gastric lesions and grade IV as oral and esophageal lesions accompanied by gastric lesions. **Results:** Common symptoms were buccal pain in 41, vomiting in 36, dysphagia in 16, diarrhea in 11 and abdominal pain in 10 cases. The endoscopic findings based on location of lesion was grade I in 10, grade II in 8, grade III in 12 and grade IV in 28 cases. The difference was significant (P< 0.05). **Conclusion:** Males were mostly affected than females. Maximum cases were of grade IV.
Key words: Esophageal lesions, Endoscopic, Paraquat poisoning

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INTRODUCTION

Morbidity and mortality related to acute poisoning is a serious health concern worldwide. Acute poisoning results in a large number of fatalities, especially in the developing countries where poisoning is reported as a preferred means of suicide.[1] Poisoning is one of the preferred methods for committing suicide in India. In a study from the region, poisoning was reported as the second most common cause of non-natural deaths, with fatal self-poisoning reported in more than 90% of the cases.[2] The nature and cause of acute poisoning may vary regionally and globally. Agrochemicals and pesticides are most commonly implicated in acute poisonings in India.[3]

Paraquat (1, r-dimethyl-4,4'- bipyridium dichloride), a brown syrupy liquid is an effective herbicide that has low chronic toxicity because of its rapid deactivation on contact with soil.[4] Although it is uncommon, paraquat ingestion can lead to severe and often fatal toxicity. However, although it is widely available, reports of this herbicide poisoning are not common in India. This toxin, through oxidative stress resulting from the production of superoxide anions, causes cell injury.[5] Patients with mild poisoning (consumption of 7.5 ml of 20% solution) usually are either asymptomatic or show mild gastrointestinal symptoms and survive. Consumption of higher amounts leads to mortality through multiple organ failures. Gastrointestinal symptoms are seen in the most patients who have consumed paraquat orally.[6] The present study was conducted to assess cases of Paraquat poisoning in known population.

MATERIALS & METHODS

The present study comprised of 58 cases of Paraquat poisoning of both genders. The study was approved from institutional ethical committee. Parameters such as age, sex, the amount of ingested toxin, endoscopy findings, and final gastrointestinal complications were recorded.

The endoscopy results that were recorded in the medical files were graded according to the severity and location of the injury by the gastroenterologist. Gastrointestinal complications were defined as follows: hematemesis, melena, hematochezia, and anemia. Endoscopic findings based on location were classified into grade I as oral or pharyngeal mucosa lesion, grade II as oral cavity combined with focal esophageal lesions, grade III as oral and diffuse esophageal lesions but without gastric lesions and grade IV as oral and esophageal lesions accompanied by gastric lesions. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 58		
Gender	**Males**	**Females**
Number	38	20

Table I shows that out of 58 cases, males were 38 and females were 20.

Table II Symptoms in patients

Symptoms	Number	P value
Buccal pain	41	0.02
Vomiting	36	
Dysphagia	16	
Diarrhea	11	
Abdominal pain	10	

Table II, graph I shows that common symptoms were buccal pain in 41, vomiting in 36, dysphagia in 16, diarrhea in 11 and abdominal pain in 10 cases. The difference was significant (P< 0.05).

Graph I Symptoms in patients

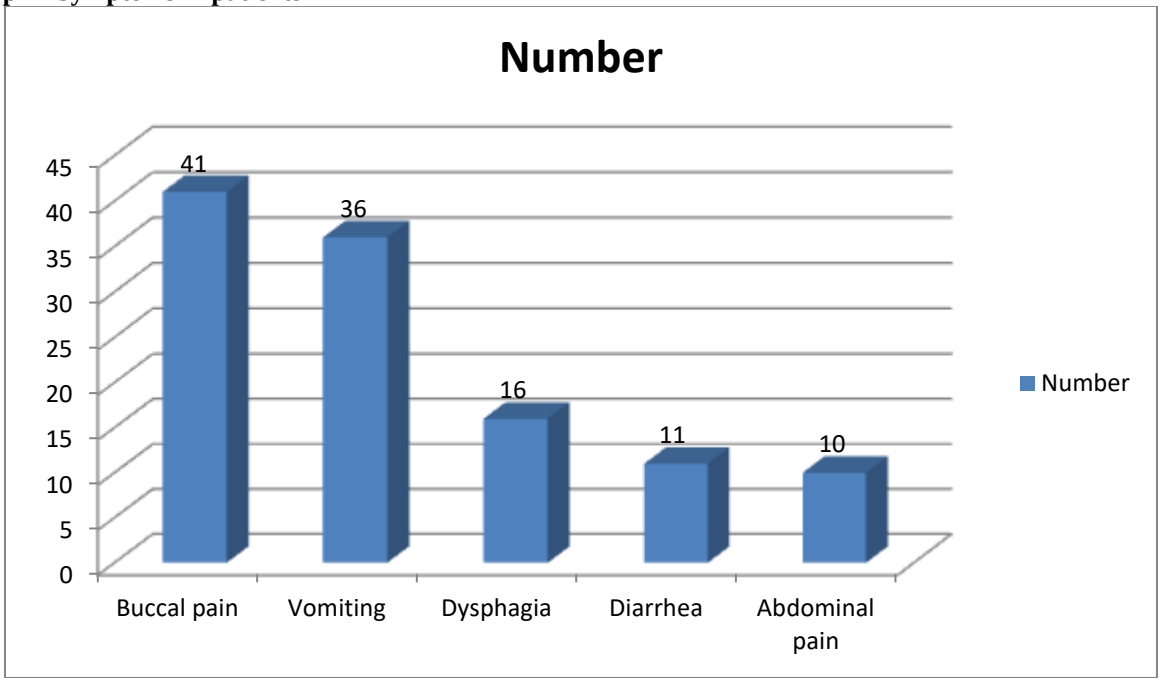
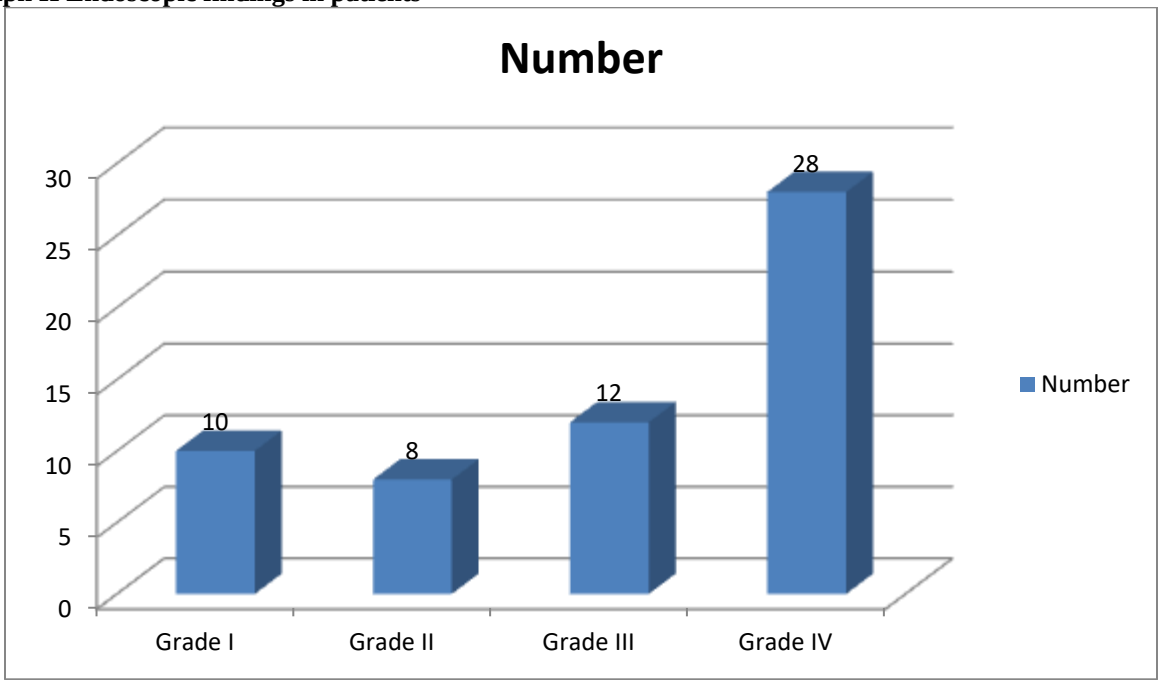


Table III Endoscopic findings in patients

Grade	Number	P value
Based on location of lesion		
Grade I	10	0.05
Grade II	8	
Grade III	12	
Grade IV	28	

Table III, graph II shows that endoscopic findings based on location of lesion was grade I in 10, grade II in 8, grade III in 12 and grade IV in 28 cases. The difference was significant (P< 0.05).

Graph II Endoscopic findings in patients



DISCUSSION

Paraquat, a dipyridyl compound, owes its name to the para positions of its quaternary nitrogens. It is widely used for weed control in about 100 countries, either to prepare the land before planting or for controlling weeds in more than 100 crop varieties.[7] Its use is banned in 32 countries and sale restricted in a few others because of health concerns.[8] Commercially, it is available in India in liquid form as GRAMOXONE (10–30% concentration) and in granule form as WEEDOL (5% concentration). Paraquat is exceedingly toxic to humans, and as little as one teaspoonful of the active ingredient may be fatal with death known to occur as late as 30 days after the ingestion.[9] The most likely route of paraquat poisoning is ingestion; however, poisoning may also occur after skin exposure or inhalation. Although the WHO has estimated the lethal dose for humans to be 30–50 mg/kg, case studies have recorded the lowest fatal dose to be 17 mg/kg and even lower doses may be fatal among children.[10] The present study was conducted to assess cases of Paraquat poisoning in known population.

In present study, out of 58 cases, males were 38 and females were 20. We found that common symptoms were buccal pain in 41, vomiting in 36, dysphagia in 16, diarrhea in 11 and abdominal pain in 10 cases. Torabi et al[11] in this cross-sectional study, patients who were over 16 years old and suffering from paraquat poisoning were referred to the hospital in first 24 hours of poisoning and underwent endoscopy. These patients were investigated during five years. The hospital mortality rate was considered as the criterion for the evaluation of the patients' results. A total of 78 paraquat-poisoned patients were included in the study. The hospital mortality rate was observed to be 23.10%. According to the gastrointestinal endoscopic findings, the highest extent of the injury was Grade IV, which was observed in 44 patients (56.41%) and the most severe injury was Grade II-a, which was seen in 36 patients (46.15%). There was no significant relationship between the hospital mortality rate and the endoscopy

findings in terms of neither the extent nor the severity of the injury.

We observed that endoscopic findings based on location of lesion was grade I in 10, grade II in 8, grade III in 12 and grade IV in 28 cases. Kanchan et al[12] found that Paraquat poisonings constituted 14.4% of the total poisoning fatalities during the study period. Equal number of males and females were observed in the present study. The victims were aged between 17 and 65 years (mean ± SD = 30.2 ± 13.1 years). Manner of death was suicidal in 92.9% cases. Common presenting symptoms after ingestion of paraquat included vomiting, followed by difficulty in breathing. In the present series, overall survival post paraquat consumption ranged between 10 h and 25 days. Half of the victims died within 2 days of consumption of poison. The underlying cause of death included acute renal failure (ARF), adult respiratory distress syndrome (ARDS), multiorgan failure (MOF), acute liver failure, etc., In all the cases, brain was congested and edematous, and visceral organs showed marked congestion at autopsy. Lungs were congested with marked edema in 10 cases.

CONCLUSION

Authors found that maximum cases were of grade IV and males were mostly affected than females.

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