

CAUSTIC INGESTION INJURIES - AT MILITARY HOSPITAL RAWALPINDI

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ABSTRACT

Objectives: To study the pattern and endoscopic severity of caustic ingestion injuries presenting at Military Hospital Rawalpindi.

Study Design: Descriptive study.

Place and Duration of Study: The study was conducted at Medical and Gastroenterology Department Military Hospital Rawalpindi from August 2012 to April 2013.

Material and Methods: Patients were selected from those who presented with caustic ingestion history in Medical OPD, ER and in medical wards. After informed consent the patient underwent upper gastrointestinal (GI) Endoscopy. Endoscopic findings were recorded.

Results: Out of 50 patients, 21(42%) were males and 29 (58%) were females. Ingestion was accidental in 19 (38%) and was with intent of suicide or self-harm in 31(62%) patients. Mean age was 33.2 years (SD \pm 13.2). All the patients were subjected to upper GI endoscopy and findings were recorded. Endoscopic findings were grade 0 in 4 (8%), Grade 1 in 6 (12%), grade 2a in 7 (14%), grade 2b in 10 (20%), grade 3a in 6 (12%) and grade 3b in 17 (34%) patients.

Conclusion: Caustic ingestion injuries were seen more in younger females with predominant cause as suicidal intent. On endoscopic examination severe corrosive injuries were more frequent.

Keywords: Caustic injury, Corrosive injury.

INTRODUCTION

Caustic ingestion can cause severe injury to the esophagus and the stomach. The severity and extent of esophageal and gastric damage resulting from a caustic ingestion depends upon corrosive properties of the ingested substance, amount, concentration, and physical form of the agent and the duration of contact¹⁻². Caustic esophageal injury results from accidental ingestion of corrosive in children³ and it is intentional in adults most of the times⁴. Children frequently expectorate most of the caustic agent before swallowing, thereby minimizing injury⁵. Suicidal patients ingest larger amounts than those who accidentally swallow these agents; as a result, they are likely to have more severe esophageal and gastric damage. The most common cause is ingestion of strong alkali contained in drain cleaners, other household cleaning products. Liquid household bleach ingestion is frequently reported, but rarely causes severe esophageal injury². Acute injury may result in esophageal, gastric or duodenal ulceration/perforation, mediastinitis, peritonitis and death⁶. Alkali

ingestions typically damage the esophagus more than the stomach or duodenum whereas acids cause more severe gastric injury. Aspiration can also induce both laryngeal and tracheobronchial injury. A study comparing outcomes of acid or alkali ingestion found that outcomes were overall worse for those who ingested acid⁷. Ingestion of alkali acutely results in liquefactive necrosis. In the stomach, partial neutralization of the ingested alkali by gastric acid may result in a more limited injury. Duodenal injury is much less common, occurring in 30%, in contrast to 100 and 94% involvement of the esophagus and stomach, respectively⁸. Extensive transmural damage may result in esophageal, gastric, or duodenal perforation, mediastinitis, peritonitis, and death⁹. The likelihood of stricture formation depends upon depth of damage and degree of collagen deposition¹⁰. Death and severe complications primarily occur in patients with severe second-degree and third-degree burns⁸. Acid ingestion typically produces a superficial coagulation necrosis that thromboses the underlying mucosal blood vessels and consolidates the connective tissue, thereby forming a protective eschar¹¹. In contrast to the more viscous alkaline solutions, acid preparations tend to pass quickly into the stomach, causing less esophageal damage. As

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the acid flows along the lesser curvature of the stomach toward the pylorus, pylorospasm impairs emptying into the duodenum producing stagnation and injury that is particularly prominent in the antrum. Food in the stomach tends to provide a protective effect. Upper gastrointestinal endoscopy should be performed during the first 24 hours after ingestion in order to evaluate the extent of esophageal and gastric damage, establish prognosis, and guide therapy⁷. Endoscopy is contraindicated in patients who are hemodynamically unstable, have evidence of perforation or severe respiratory distress, or oropharyngeal /glottic edema. Adequate pain relief with intravenous narcotics needs to be maintained continuously until the patient improves¹². Clinical signs of perforation, mediastinitis, or peritonitis are indications for emergency surgery¹³. A grading system for esophageal injury to predict subsequent clinical outcome has been developed by Zargar¹⁴ as shown below.

This study was carried out because we commonly see such corrosive injuries in our department and they remain a major cause of morbidity and mortality. Our work helped to analyze the pattern of disease and the severity of injury, as future management and expected complications depend on the severity.

The rationale was to study the pattern and endoscopic severity of caustic ingestion injuries presenting at Military Hospital Rawalpindi.

MATERIAL AND METHODS

The descriptive study was conducted at Medical / Gastroenterology Department Military Hospital Rawalpindi from August 2012 to April 2013. Patients of 18-70 years, of either sex with clear history of caustic intake within 24 hours of ingestion were included in study. The patients having time period on presentation more than 24 hours. Non-caustic stricture. Malignant strictures/ fistulae or diverticulae. Suspected mediastinitis, peritonitis or hemodynamic instability or respiratory distress, or oropharyngeal or glottic edema / necrosis were excluded.

Sampling Technique

Total 50 patients were included in the study through non-probability convenient sampling.

Data Collection Procedure

Permission from hospital ethical committee was sought. Patients selected from medical OPD, ER and those admitted in Department of Gastroenterology, Military Hospital Rawalpindi.

A detailed history was taken from each patient including the time since ingestion, cause of ingestion. Symptoms were recorded. Relevant clinical examination was also done. After informed consent, the patients underwent Upper GI endoscopy and the findings were recorded as per Zarger's classification (Table-1).

Confounding variables were controlled by excluding presence of malignant strictures or other non-caustic strictures.

All data was recorded in a proforma.

Data Analysis Procedure

Data had been analyzed using Statistical Package for Social Sciences (SPSS) version 11. Mean and standard deviation (SD) were calculated for quantitative variables like age. Frequency and percentages were calculated for qualitative variables like gender and endoscopic findings.

RESULTS

Gender distribution is shown in figure-1. Ingestion was accidental in 19 (38%) and was with intent of self-harm / suicide in 31 (62%) patients. Mean age was 33.2 years (SD \pm 13.2) with minimum age of 18yrs whereas maximum age of 68 yrs. All the patients were also subjected to upper GI endoscopy and findings were recorded. Endoscopic findings are shown in Table-1.

DISCUSSION

Corrosive intake is a serious medical emergency seen in our medical setups. People are exposed to more and more social issues in daily life. Caustic injuries not only cause immediate morbidity and mortality but also lead to lifelong disability. Increasing incidence has been noted in developing countries¹⁵ and

the annual incidence rate for adult women attempting suicide had an increasing trend¹⁶.

Caustic injuries especially in setting of suicidal intent in our society are usually hushed up and patients are denied timely medical treatment and ultimately come to the hospitals with debilitating complications at a later stage. Medical awareness needs to be inculcated so that corrosive injuries reach hospital in time and early endoscopy is done so that baseline record is made and patients requiring emergency surgery should be referred to the specialized units. Patients should be followed up for timely identification of the complications like strictures, gastric outlet obstruction and their treatment. Long term complications like malignancy should also be kept in mind.

Caustic ingestion is a medical emergency especially in settings of suicidal intent in younger individuals. Usually considered as a taboo such patients are either denied medical treatment or brought to the hospital so late when either serious complications have set in or the patient is sick enough to undergo any less invasive and helpful procedure. Patients presenting to the hospital should be assessed for upper GI endoscopy preferably within first 12 hrs and maximum of 24 hrs to assess the degree of injury^{7,17}. Esophagectomy may be required for patients with severe strictures¹⁸. Perforation, mediastinitis, or peritonitis are indications for emergency surgery. Up to one-third of patients who suffer caustic esophageal injury develop

Perforation occurs in approximately 0.5% of procedures, and surgical correction is required

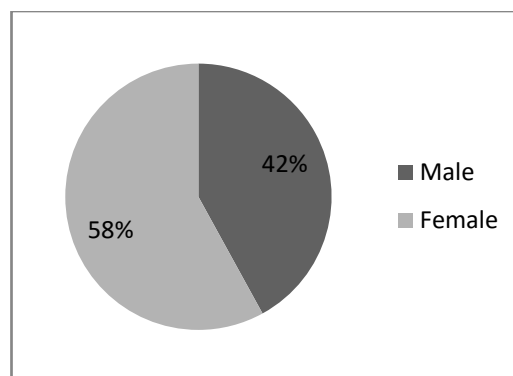


Figure-1: Gender description of patients of caustic ingestion injuries (n=50).

Table-1: Endoscopic findings in patients of caustic ingestion injuries (n=50).

Endoscopic Grade	Number of patients	Percentage
Grade 0	4	8
Grade 1	6	12
Grade 2a	7	14
Grade 2b	10	20
Grade 3a	6	12
Grade 3b	17	34

in 70% of patients. The goal is to dilate the esophageal lumen to 15 mm and to completely relieve dysphagia¹⁹. Thick-walled strictures are more difficult to dilate and tend to recur rapidly²⁰. The most common late complications are esophageal strictures and stenosis, gastric stenosis of the antrum and pylorus, esophageal

Table-2: Zargar's grading classification of mucosal injury caused by ingestion of caustic substances.

Grade 0	Normal examination
Grade 1	edema and hyperemia of the mucosa
Grade 2a	Superficial ulceration, erosions, friability, blisters, exudates, hemorrhages, whitish membranes
Grade 2b	Grade 2a plus deep discrete or circumferential ulcerations
Grade 3a	Small scattered areas of multiple ulceration and areas of necrosis with brown-black or grayish discoloration
Grade 3b	Extensive necrosis

esophageal strictures within two months⁸. Esophageal dilations should be initiated and advanced slowly in order to avoid perforation. Clinicians wait three to six weeks after the initial injury before attempting dilation⁶.

and stomach cancer²¹.

Our study showed that that younger age group patients, majority females were involved. Main cause of ingestion was suicidal intent.

Endoscopic findings showed severe i.e Grade 3b injuries as maximum. However Grade 0 and I were also quite significant. Main reason was apparent emotional lability in young females who when charged emotionally undertake such drastic steps but many a times at the last moment because of second thought either take sub minimal dose of caustics or such negligible amounts that lesser injuries are inflicted. But those patients who take larger doses with definite suicidal intent or accidentally without knowing what are they drinking get more severe and damaging injuries. Because Military Hospital is a tertiary care hospital and patients are generally entitled for free treatment probably this was one of the reasons that patients reported well in time after corrosive ingestion. The results of our study are comparable to those of few other studies performed in this aspect. However more local studies need to be done in this regard.

As per Mihalache et al²² majority of patients were in 4th decade of age (24.13%) in our study more patients were in third decade. Todha G et al²³ showed the average age of 37.2 years i.e third decade where caustic ingestion was due to a suicide attempt in majority of patients. Rehman S et al²⁴ also found younger age group with predominant suicidal intent.

Qureshi et al²⁵ also found suicidal intent (68.75%) more so in females (7/11) leading to corrosive injuries and subsequent strictures.

Cheng, et al²⁶ found 53% females with 71% suicidal intent majority in fourth decade. The results of upper endoscopy in this study showed that grade 3b injuries were the most common caustic injury (30.04%), followed by grade 2b injuries (22.71%).

Chang JM et al²⁷ found that attempted suicide was more commonly involved. 72% and major injury on upper endoscopy showed mainly grade 3 injuries followed by less severe ones. This finding was in line with our study.

TuzunA et al²⁸ found Grade I injuries as the most common (34.4%) encountered in his study. We also found that Grade 0 and I injuries were also in significant numbers.

On the basis of our study, it is recommended that patients with corrosive intake should report early to the hospital where upper GI endoscopy facility is available. So that estimation of their injury can be done well in time and definitive modality of treatment can be planned as required.

Conclusion

Caustic ingestion injuries were seen more in younger females with predominant cause as suicidal intent. On endoscopic examination severe corrosive injuries were more frequent.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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