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Morbidity and Mortality of Corrosive Injury of Esophagus : A Study of 50 Cases

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ABSTRACT

Objective: To evaluate the morbidity and mortality of corrosive injury of esophagus. **Introduction:** Corrosive ingestion, mostly accidental in children and with suicidal or deliberate self-harm intention in adults, still remains a prevalent condition in developing countries. It is relatively common among the illiterate people having poor socioeconomic condition residing in the rural areas. It poses a great challenge to the otorhinolaryngologist from management point of view. **Study design:** Descriptive study. **Place and duration of study:** This study was conducted in the department of ENT and Head & Neck Surgery, Allied Hospital (PMC) Faisalabad during a period of two years from November 2013 to October 2015. **Patients and Methods:** Fifty patients with history of corrosive ingestion were included in the study. All patients were admitted in the ENT department and thoroughly investigated regarding history, physical examination and investigations according to a written proforma. **Inclusion criteria:** The patients of either sex ranging from 3 years to 60 years, having history of corrosive ingestion and giving written consent for any surgical intervention and regular follow up were included in the study. **Exclusion criteria:** Patients having age below 3 years and above 60 years, patients with malignant stricture, peptic stricture and not giving written consent for surgical intervention and regular follow up were excluded. **Data analysis:** SPSS software version 20 was used to analyze the data. **Results:** Out of 50 patients, 16% were males and 84% were females ranging from 3 years to 60 years. Thirty one patients (62%) were from rural areas while 19 patients (38%) were urban dwellers. Forty one patients (82%) took acid whereas 9 patients (18%) took alkali. Eleven patients (22%) reported early within first three days of corrosive intake while 39 patients (78%) reported late. Two patients out of 50 were received in very serious condition with respiratory distress and shock who died despite of emergency treatment. Endoscopic examination of 48 survivors showed grade I corrosive injury in 6 patients (12.5%), grade II injury in 30 patients (62.5%) and grade III injury in 12 patients (25%). Forty two patients were found to develop esophageal strictures. Thirty four patients (81%) out of 42 had single stricture while 08 patients (19%) had multiple strictures who were referred to general surgery for further management. **Treatment:** Patients having minor burns were successfully managed conservatively and no stricture was found in 6 months follow up period. Patients with single stricture were managed with endoscopic dilation with good results while patients having multiple strictures of esophagus were referred to general surgery for further management. **Conclusion:** Stricture formation in the esophagus and resulting dysphagia is more frequently seen in those patients who present late after corrosive ingestion. Moreover endoscopic dilatation of corrosive induced strictures with gum elastic bougies is quite safe and effective procedure to relive dysphagia although repeated sessions of endoscopic dilatations are often required.

Keywords: Corrosive ingestion, Acids, Alkalis, Esophageal strictures, Endoscopic dilatation.

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INTRODUCTION

The management of benign esophageal strictures due to corrosive ingestion constitutes a medical challenge to the otorhinolaryngologist. Corrosive ingestion and its long term sequelae still remain a prevalent condition in the developing countries.[1] Corrosive ingestion is relatively common among the

illiterate people with poor socioeconomic conditions.[2,3] At many occasions corrosive ingestion is accidental especially in children under the age of 5 years. The adults ingest them when they have suicidal intention and deliberate self harm.[4] Acids cause injury through coagulative necrosis whereas alkalis result in liquefactive necrosis of the tissues on contact. The degree and extent of the corrosive lesion and its complications depend on several factors such as concentration of the caustic substance, quantity swallowed, fullness of stomach and duration of contact with tissue or organs.[5] In most adult patients it may be beneficial to perform an upper gastrointestinal endoscopy within 24 hours to evaluate the degree of tissue injury caused by corrosive substance. It can help to determine the treatment options and to predict prognosis.[6] Majority of the corrosive induced esophageal strictures in the developing countries usually present late when dilatation procedures are likely to be more difficult and carry significant high recurrence rate.[2] This late presentation may be related to ignorance on the nature of the disease and its management and to poverty as well.[5] Patients seek home based therapy by traditional healers and only present at the hospital when complications have set in. Corrosive injuries are frequently more serious in adults who intentionally ingest the chemicals and usually in large amounts which leads to lifelong debilitating conditions.[7] The goals of therapy for benign corrosive esophageal strictures are the relief of dysphagia and prevention of stricture formation.[8] Ninety percent of the corrosive induced esophageal strictures respond to endoscopic dilatation while the remainder will require esophageal replacement.[9] It seems reasonable to assume that endoscopic dilatation is successful and quite effective procedure to manage the caustic esophageal strictures.[10,11]

The present study has been conducted to evaluate the morbidity and mortality of corrosive injury of the esophagus among the population affected by corrosive ingestion.

METHODOLOGY

This descriptive study was carried out in the department of ENT and Head & Neck Surgery Allied Hospital (PMC) Faisalabad during a period of two years from November 2013 to October 2015. Fifty patients of either sex ranging from 03 years to 60 years, having history of corrosive ingestion and giving written consent for any surgical intervention and regular follow up were included in the study. Patients having age below 03 years and above 60 years, patients with malignant stricture, peptic stricture and patients not giving written consent for surgical intervention and regular follow up were excluded.

All the patients were thoroughly evaluated regarding detailed history according to a written proforma. Detailed physical examination was performed as well. All the patients were investigated for complete blood count, blood urea, serum creatinine, blood sugar, serum electrolytes and x-rays barium swallow. All the patients underwent endoscopic examination to evaluate the degree of corrosive injury. Gum elastic bougies of increasing size were used to dilate the esophageal strictures under general anesthesia in those patients having corrosive induced strictures causing dysphagia. The esophageal dilatation was started with 5 mm (15 Fr) gum elastic bougie with an aim to achieve at least 15 mm (45 Fr) lumen size. Upto 4 to 8 dilators were used on each session. Repeated sessions were arranged fortnightly till satisfactory lumen size of the esophagus (at least 15 mm) was achieved. All patients undergoing endoscopic dilation were also given antibiotics, steroids and proton pump inhibitors after each session. SPSS version 20 was used to analyze the data. Chi square test was applied and P values less than 0.05 were considered statistically significant.

RESULTS

Out of 50 patients, 08 patients (16%) were males and 42 patients (84%) were females (Fig.1) ranging from 03 years to 60 years. Thirty three patients (66%) were belonging to relatively younger age group ranging from 16 years to 30 years with mean age of 20.5 years (Tab.1). Thirty one patients (62%) were from rural areas while 19 patients (38%) were urban dwellers. Forty one patients (82%) took acid whereas 9 patients (18%) took alkali. Eleven patients (22%) reported early within first three days of corrosive intake while 39 patients (78%) reported late (Tab.2). Two patients out of 50 were received in very serious condition with respiratory distress and shock who could not survive in spite of emergency treatment. Endoscopic examination of 48 survivors showed grade I corrosive injury in 6 patients (12.5%), grade II injury in 30 patients (62.5%) and grade III injury in 12 patients (25%).

Table 1: Age distribution (n=50)

Sr. No.	Age distribution (years)	No. of patients	Percentage	Mean age in years
1	03-05	02	04%	
2	06-10	02	04%	
3	11-15	06	12%	
4	16-20	15	30%	20.5
5	21-25	13	26%	
6	26-30	05	10%	
7	31-35	02	04%	
8	36-40	02	04%	
9	41-45	01	02%	
10	46-50	01	02%	
11	51-55	00	00%	
12	56-60	01	02%	

Forty two patients were found to develop esophageal strictures. Thirty four patients (81%) out of 42 had single stricture while 08 patients (19%) had multiple strictures (Fig.2) who were referred to general surgery for further management. Six patients (12.5%) having minor corrosive injury were successfully managed conservatively and no stricture developed in six months follow up period. Out of 34 patients with single stricture, endoscopic dilatation was found successful in 24 patients (70.5%) whereas it was unsuccessful in 07 patients (20.5%). Three patients (09%) had perforation during the endoscopic dilatation who were managed according to the appropriate protocol. Total 528 dilatations were performed during the whole study which reflected the incidence rate of complication up to 0.56% (Tab.3).

Table 2: Indicating mode of presentation of the patients (n=50)

Sr. No.	Presentation	No. of patients	Percentage
1	Early	11	22%
2	Late	39	78%

Table 3: Showing endoscopic dilatation results (n=34); Total number of dilatations= 528.

Sr. No.	Result	No. of patients	Percentage
1	Successful (15 mm)	24	70.5%
2	Unsuccessful	07	20.5%
3	Perforation	03	09%
4	Incidence rate of complications	No. of perforation/ total no. of dilatations X 100 (3/528 x 100)	0.56%

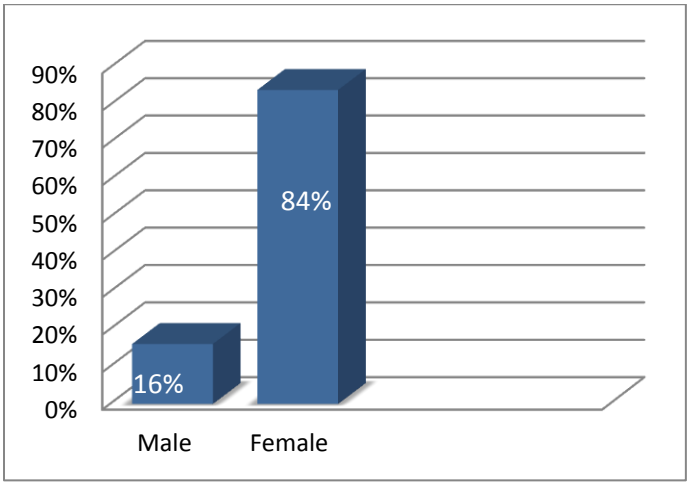

Figure 1: Gender Distribution

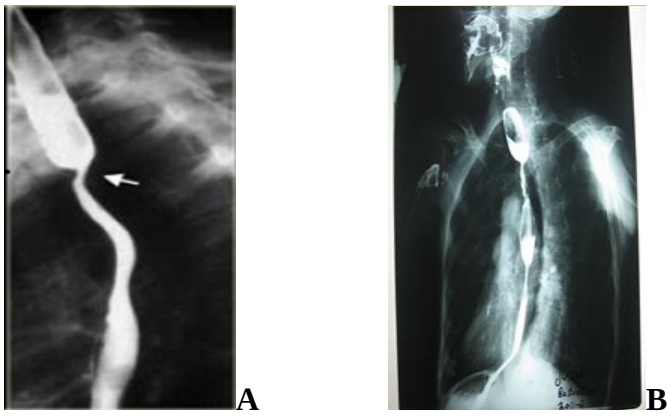

Figure 2: X-rays barium swallow showing single stricture (A) and multiple strictures (B)

DISCUSSION

Corrosive ingestion whether accidental or suicidal is the most dangerous weapon through which it torments humanity. The management of corrosive induced esophageal strictures constitutes a medical challenge to the otorhinolaryngologist. Corrosive ingestion and its long term sequelae still remain a prevalent condition in the developing countries.[1]

Corrosive ingestion is relatively common among the illiterate people with poor socioeconomic status especially residing in the rural areas.[2,3] On many occasions corrosive ingestion is accidental especially when the victims are children under the age of 5 years. The adults ingest the corrosive substance when they have suicidal intention or deliberate self harm.[4]

Our study showed that the majority of the patients of corrosive ingestion were females (84%) and belonged to relatively younger age group (66%) having age range from 16 years to 30 years with mean age of 20.5 years. They were illiterate (56%), residing in the rural areas (62%) and had a poor socioeconomic status (70%). All these findings are consistent with international research done in the past.[2,3] Stricture formation in the esophagus is a common complication after acid intake. Acidic substances usually do more harm to the stomach than the esophagus.[6,12] Our study also showed that majority of our patients developed strictures indicating single stricture in 81% of the patients whereas multiple strictures in 19% of the patients. Majority of the patients with corrosive induced strictures in the developing countries usually present late when dilation procedures are likely to be more difficult and are associated with high recurrence rate.[2] This late presentation may be related to ignorance on the nature of the disease and its management and also to poverty.[5] These patients initially seek home based therapy by traditional healers and only present at the hospital when the complications have started to appear. Our present study supports this idea as well indicating only 22% patients presenting in the hospital at an early stage while 78% presenting late. Endoscopically esophageal injury can be graded according to whether or not the lesions are circumferential, ulcerated or necrotic.[13] For early detection of esophageal stricture, the patients with grade II and grade III esophageal injury should have barium swallow at 2,4,6 and 8 weeks.[14]

Endoscopic examination of our patients revealed 12.5% patients to have grade I corrosive burn, 62.5% patients with grade II burn and 25% patients with grade III burn. The patients who presented early with grade I corrosive injury were managed conservatively through airway management, intra venous fluid resuscitation, N-G passage for feeding and stenting, Injectable antibiotics, analgesics, antacids, proton pump inhibitors and steroids. This management has been found to prevent complications such as malnutrition, electrolyte imbalance and reduced tendency to develop stricture formation.[15] Although use of steroids to prevent stricture formation is controversial, yet many clinicians feel that a 3 week course of prednisolone is helpful and widely used.[16] Another study conducted by Usta M et al shows that high doses of methylprednisolone used for the management of grade II-b esophageal burns may reduce stricture development.[17] On the other hand Ulman found no objective evidence to support the use of steroids to prevent stricture formation.[18]

The results of endoscopic dilatation of corrosive strictures is variable worldwide. A local study by Ahmed S et al has reported successful endoscopic dilatation in only 25% of the cases.[19] Another study by Hamza AF et al showed 60-80% success rate in children with caustic strictures that shows dilatation as the first line of treatment unless contraindicated.[20] Our results of endoscopic dilatation correlate well with these results that shows successful dilatation to be 70.5%. Other studies from abroad also reported endoscopic dilatation as successful and quite effective method to treat corrosive strictures.[10,11] Complication rate due to procedure itself is also low in our study which is 0.56%. This low complication rate is comparable to other researches from local as well as abroad.[21,22.]

CONCLUSIONS

1. Stricture formation in the esophagus due to corrosive ingestion and resulting dysphagia depend on the severity/ grade of the corrosive lesion. Later the patient presents after corrosive ingestion and greater the grade of injury, the more chances of stricture formation in the esophagus.
2. Endoscopic dilatation of the esophageal strictures because of corrosive ingestion with gum elastic bougies is quite safe and effective procedure to releive dysphagia although repeated sessions of endoscopic dilatations are often required due to recurrence of the strictures.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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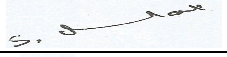
Prof. Dr. Muhammad Ali Tirmizey	Proof Reading & References	
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