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Research Article

**CORROSIVE INTAKE AND ESOPHAGEAL STRICTURE
FORMATION: A CASE STUDY**¹Dr Mir Arslan Ahmad ²Dr Taha Nazir Warraich ³Dr Zeeshan Adeel¹Services Hospital Lahore ²Combined Military Hospital Lahore ³Nishter Medical University Hospital Multan

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Abstract:

This study is aimed to quantify the effects of ingestion of corrosives that lead to the injuries of esophagus and formation of strictures.

Method: *This is retrospective cross-sectional study, conducted on 188 patients having history of corrosive ingestion that have lead to esophageal injuries. The patients underwent upper GI endoscopy during first 48 hours of the incident, and same procedure was repeated 6 weeks after the incident to check for stricture formation.*

Result: *In the data collected, 99 patients were found to have severe esophageal injuries following the incident of corrosive intake; conversly, 89 patients found to have mild injuries. Among the severely injured 99 patients 31 were reported to have developed the strictures due to corrosive ingestion in comparison to the 10 cases who have mildly injured esophagus resulted in strictures. The difference was significant statistically.*

Conclusion: *In the light of our study, it is concluded that the patients who get lethal esophageal injuries more tend to develop strictures in comparison with the patients with mild esophageal injury.*

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INTRODUCTION:

The ingestion of the Corrosive materials is a lethal and life threatening medical problem associated with serious complications i.e., bleeding, perforation, strictures and systemic complications (renal insufficiency, hepatic failure, and DIC) fistula, gastric outlet obstruction and cancer [3]. It has been noted from the studies that In the children of age less than 10 years of age, ingestion happened accidentally while in the adults intake occurred intentionally. [3] The alkali ingestion results in the liquefactive necrosis that penetrates into deep body tissues [4]. The damage caused by the alkali ingestion lasts for four to five days and this damage is associated with the vascular thrombosis, mucosal inflammation, ulceration and sloughing of the tissues [5]. The injury resulted by alkali ingestion is far more lethal in comparison with the acid ingestion [6]. The acid ingestion results in the coagulation of the superficial tissues and vascular thrombosis of the area in contact of the body. The injury due to acid results in the protective Escher formation which prevents the acid from further penetration into the deep tissues. Moreover, the acid ingestion causes severe pain in the pharyngeal region so this results in the reduced consumption amount of the acid [7,8]. The upper GI endoscopy is done for the evaluation of the extent of the Injury as it is the most important test to be done in acid and alkali ingestion patients [9]. This test should be done in the first 24 hours in order to evaluate the nature of injury and to determine clinical outcome along with the prognosis in this case. Moreover, it may also help the physician to decide which medication should be used to reduce the swelling and hyperemia of the tract [10]. The grading system can also be used for the evaluation of the extend of the damage, stricture formation and other complications like the degree of the malnutrition following the corrosive ingestion [11].

PATIENTS AND METHODS:

This is a retrospective type of cross sectional study conducted in the department of gastroenterology Services hospital, Lahore from April 2017 to August 2018. During this study, 188 patients having the history of corrosive ingestion were selected. All of the cases had clinical finding in them i.e. severe mucosal edema, drooling, vomiting, , oropharyngeal fibrosis, hyperemia, hematemesis and respiratory distress. Moreover, these patients already had undergone upper GI endoscopy within first 2 days of the intake for grading and evaluation of the nature of injury. Exclusion and Inclusion criteria: The patients who were clinically unstable due to severe laryngeal edema, respiratory distress, necrosis, hemorrhage, and perforation were excluded from the study and the

asymptomatic patients and in those upper GI endoscopy is contraindicated were also not included in the study.

All of the patients were informed properly about this procedure and written informed consent was taken from them. They underwent upper GI endoscopy in the first 48 hours of intake in order to evaluate and access the extent and magnitude of the injury according to the Di Costanza grading system. The variables, quantitative and qualitative (age, sex, degree of injury and complications developed) were noted and analysed by spss version 21.0. The stratification of the effect modifiers among these variables was done and post stratification Chi square test was applied with $p < 0.05$. This grading system devised as: normal = grade 0 = mucosal edema and hyperemia = grade 1, bleeding and superficial ulcer = grade 2A, deep ulcers = grade 2B, scattered necrotic area with black mucosa = grade 3. The upper GI endoscopy was conducted under the local anesthesia with the fiberoptic Pentax LH-150PC (Japan) endoscope, the intervention was supervised by senior consultants. Prophylactic antibiotics and antihistamine were given before the procedure. In the patients with grade 0 or grade 1 disease intravenous antibiotics and antihistamine were omitted and they were sent home with oral medications. The patients with grade 2 or grade 3 injuries, intravenous antibiotics and antihistamine or proton pump inhibitors were given for two weeks. Intravenous antibiotic and H2 receptor blockers were stopped in the patients with grade 0 and grade 1 injuries. These patients were discharged on the oral medication after the endoscopy had been done. The patients with grade 2 and grade 3 injuries were given the injectable antibiotics and H2 receptor blocker for 2 weeks. The patients having grade 2 or grade 3 disease with out severe gastritis were passed nasogastric tubes and feeding was started with it and the patients who had severe gastritis were put on total parental nutrition for 2 to 4 weeks. Upper GI endoscopy was repeated after 6 weeks to check for any stricture formation,

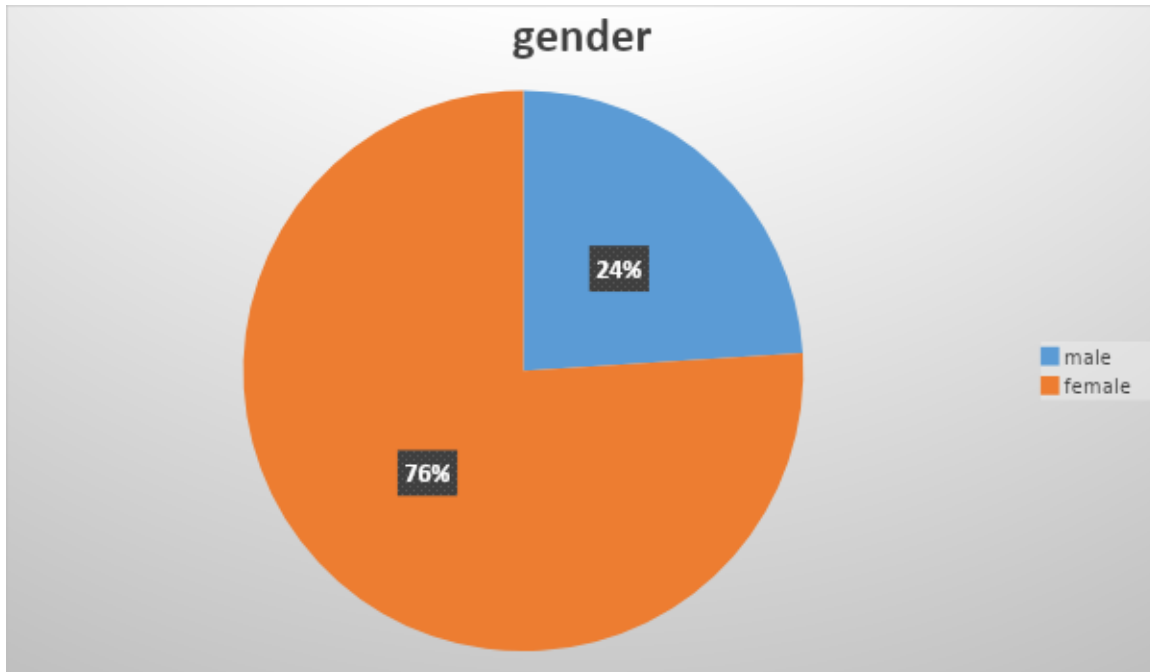
RESULTS:

In our study, female patients were reported to be suffering from complications of corrosive ingestion injuries as compared to the males. 45 were male patients and remaining 183 were female cases. The mean age of patients was found to be 29.89 years. Out of the cases enrolled 27 were found to have normal endoscopic reports whereas, the remaining had some degree of the esophageal damage noted on endoscopy. About 31 patients had normal esophagus on the upper GI endoscopy. In remaining 161 patients some degree of esophageal damage were noted on endoscopy. The

grade 1 esophageal injury was reported to be the commonest. Grade 2a, 2b and 3 that is evident on endoscopy done within first 2 days regarded as the severe esophageal injury. In the 28 patients having grade 0 injury according to the grading system, no stricture formation is reported. While in 71 cases with grade 1 injury, 9 of them developed esophageal strictures. Among 49 cases with grade 2a injury, 15 of

them reported to have developed esophageal strictures. Among 26 cases with grade 2b esophageal injury, 16 of them developed strictures. While in 16 remaining patients having grade 3 injury, 12 cases reported to have developed strictures. It can be assumed from the findings that the strictures formation in patients with corrosive intake was directly proportion to the grade of esophageal injuries.

Gender percentage enrolled in the study:



grades and stricture formation in different groups

grade	stricture formed	no stricture formed
0	zero	28 (100%)
1	9	71 (12.6%)
2a	49	15 (30.6%)
2b	26	16 (61%)
3	16	12 (75%)

DISCUSSION:

The patients who suffered from the high grade esophageal injuries more tend to develop strictures. In the study conducted by Lucky et al, the frequency of corrosive ingestion is more in adult during 30s while in the children; the rate of incidence is higher when the child is below 5 years of age. The corrosive agent most commonly used is caustic soda (40-45%). The mean age of cases is 23.9 years. Among the complications, the most frequently encountered is

esophageal strictures. More than 50% cases of corrosive ingestion were suicidal attempts which has high incidence among the adults and 11% of cases presented were those who ingested accidentally that is quite common in children below 5y. The most rapidly occurring complication was odynophagia (35%) having the mortality rate of 10%. The result of this study was different from the result of our studies because the incidence of acid ingestion is quite higher in the developing countries, where acids like sulphuric

acid is easily available and used as toilet cleanser, and so is available in homes. In results of our study, it is showed that, almost 50% of corrosive ingestions was as a result of suicidal attempt because of marital conflicts, domestic stress, any death in family, physical illness, mental illness and educational stress. While in case of children accidental intake occurred since they have developed skills to spot and drink the liquids regardless of the fact that they were harmful or not. In our study the rate of esophageal strictures development was.... whereas in a study conducted in Nigerian [12] esophageal strictures were evident in almost 40% of patients. The results of various studies done in different institutions showed that the prevalence of esophageal strictures is 60%, following the corrosive ingestion [13]. The esophageal strictures formation also depends upon the type of corrosives ingested, as the acids taste sour resulting in the choking or vomiting. Moreover, acid ingestion have reduced rate of stricture formation and result in developing pneumonitis and chemical esophagitis [14].

A study conducted by chen et al, reports that out of 32 children with corrosive ingestion selected [15]. 16 of them developed high grade injury while the other 16 developed low grade injury. Of the group with low grade injury, 1 patient developed esophageal stricture. Whereas, Of the group with high grade injury, 10 children developed stricture. This results of this study is consistent with the result our study, where 41.5% of the cases having severe esophageal injury developed esophageal strictures. The suicidal ingestion of acids and other corrosives usually results in the marked oral, pharyngeal and proximal part of esophageal injuries due to hesitation while sipping of the fluid [16]. On the other hand, the incidental ingestion result in the marked intake of corrosive liquid due to unknown nature and taste and consequently, incidental cases have high rates of high grade gastric injuries and strictures.

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