

Epidemiology of oesophageal stricture and its outcome: a study among patients attending a tertiary hospital of Kolkata

Subrata Dey¹, Indira Dey^{2*}, Bhaskar Das¹ and Dipayan Ghosh¹

¹Department of Cardiothoracic Surgery, R.G. Kar Medical College, Kshudiram Bose Sarani, Kolkata, West Bengal, India and ²Department of Community Medicine, N.R.S. Medical College, Acharya Jagadish Chandra Bose Road, Kolkata, West Bengal, India

Abstract: *Background:* Corrosive ingestion is a common cause of upper gastro intestinal tract injury globally and in India as well. It is often used as a suicidal and homicidal agent although accidental ingestion are also common. *Objectives:* In this study an endeavor was made to study the socio-demographic profile and etiology of oesophageal stricture cases, to assess the long term effects of corrosive poisoning and to formulate an effective therapeutic protocol to treat the cases. *Methodology:* A prospective study was carried out among patients with history of corrosive ingestion attending the OPD of Department of Cardiovascular and Thoracic Surgery of a tertiary medical college of Kolkata from Jan to December, 2009. A pretested and predesigned schedule was used for data collection. *Result:* The present study revealed that 81.53% of the patients were female and 87.7% of the patients ingested corrosives to commit suicide. Only 13.8% were given water as pre hospital treatment and almost all the patients were taken to the health facility within 2 to 5 hours. Regular dilatation and operative procedures like gastrojejunostomy and colon bypass were found to be safe and effective in improving the swallowing function. There was no mortality among the cases. *Conclusion:* Ingestion of corrosives appear to be common in this part and approaches may include increasing peoples' skill in coping with problems by providing coping skill classes at school and counseling in the community.

Keywords: Oesophageal stricture, corrosive poisoning, oesophageal dilatation

Introduction

Chemical injuries of the oesophagus occur world wide. They occur mainly due to ingestion of corrosives like acids and alkalis. Corrosive ingestion is a common cause of upper gastro intestinal tract injury in India as well. Of the wide range of corrosives available commercially, muriatic acid poisoning is by far the commonest entity. It is commonly used in the household for cleaning toilets, basins. It is cheap and is easily available.

Self-harm has often been thought as a problem of the industrialized nations however the Global burden of disease [1], reported that 593000 people killed themselves in the developing world. A recent study from Bangladesh showed that 14% of all deaths amongst 10 -50 year old women were due to poisoning following suicidal ingestion [2]. The acid is usually consumed by younger subjects, often with a compromised psyche. Initial treatment for these injuries is carried out in different hospitals. Esophageal

burns, gastric perforation and peritonitis present with acute life-threatening emergencies. However, it is the delayed complications of oesophageal strictures and gastric outlet obstruction that lead to considerable morbidity. Patients also suffer from lack of nutrition due to varying grades of dysphagia and respiratory complications. Contrast studies give an idea of detailed involvement and helps planning therapy. In this study an endeavor was made to study the sociodemographic profile and etiology of oesophageal stricture cases, to assess the long term effects of corrosive poisoning and to formulate an effective therapeutic protocol to treat the cases.

Material and Methods

This prospective study was conducted in the Department of Cardiothoracic and Vascular surgery of R G Kar Medical College & Hospital, Kolkata. This a modern hospital and post-graduate teaching Institute having all

types of investigation facilities and equipment required for the study. All the cases who attended the OPD or were referred from other departments and health facilities with a history of corrosive ingestion from Jan to Dec, 2009 were considered for the study. Ethical clearance was obtained from the ethical committee of the institute and informed consent was taken from the patients after describing the purpose of the study. A predesigned and pretested schedule was used for data collection which included socio-demographic details, the corrosive ingested and the reason for ingestion. The time lag from injury to first reporting to the health facility was documented and clinical parameters were noted. Necessary investigations (Hb%, PCV, CXR, Contrast-studies with Barium or Gastograffin,) were done and the nature of surgery (feeding jejunostomy, Anterior gastro-jejunostomy with esophageal dilatation, Colon bypass with dilatation of the conduit) undertaken in each case was individualized. Follow-up studies were undertaken at regular intervals to study the ability to swallow and gain in weight. Proportions were used for statistical analysis.

Results and Discussion

A total of 65 patients of age 10-55 years attended the OPD during this 1 year period, among whom 12 were males and 53 females giving a M:F ratio of 1:4.5. The mean age of the patients was 29.8 + 11.04. Most of the cases belonged to 20-30 years of age. The present study revealed female preponderance of oesophageal strictures and were mostly suicidal attempts. Most of the females attempted suicide and came with oesophageal stricture at an early age compared to the males (Table-1). On the contrary, a study carried out in Nigeria [3] showed that male patients maintained dominance over females in the incidence of corrosive strictures.

Age	Sex		
	Male	Female	Total
<10	1(8.3)	0	1(1.6)
10 – 20	0	16(30.2)	16(24.6)
20 – 30	3(25)	18(34)	21(32.3)
30 – 40	2(16.7)	14(26.4)	16(24.6)
40 – 50	3(25)	5(9.4)	8(12.3)
>50	3(25)	0	3(4.6)
Total	12(18.5)	53(81.5)	65(100)

Figure in parentheses indicate percentages

Majority of the patients were Hindus and more than ¾ of them resided in urban areas. Most of the patients had education above the secondary level and 13.8% of the study population were students. Among females coming with oesophageal strictures, 83% were housewives. The per capita monthly income of the family ranged from Rs 800 to Rs 2500 and most of the families belonged to social class IV according to modified BG Prasad scale (Table-2).

Category	No.	(%)
Residence		
Rural	15	(23.1)
Urban	50	(76.9)
Marital Status		
Married	52	(80)
Single	13	(20)
Religion		
Hindu	44	(67.7)
Muslim	21	(32.3)
Education		
Illiterate	5	(7.7)
Just literate	14	(21.5)
Primary education	4	(6.2)
Middle school Education	3	(4.6)
Secondary Education	30	(46.1)
Higher secondary	4	(6.2)
Graduate	5	(7.7)
Socio-economic class (B G Prasad Scale)		
Class II	12	(18.5)
Class III	21	(32.3)
Class IV	32	(49.2)
Total	65	(100)

The offending agent was found to be acids (muriatic acids, Harpic and others) in all the cases. Attempted suicide was the reason for ingestion in 57(87.7%) of the patients while it was accidental in 7(10.7%) others. In one of the females it was suspected to be a case of homicide as mentioned by the relatives. Two of the female patients attempting suicide were found to have psychiatric problem. However,

it is alarming to find that 13.8% of the patients were students who found it difficult to cope with their educational aspirations and attempted suicide. The Nigerian study [3] found that both acid and alkali like caustic soda was ingested by 55.1% and 35.9% cases respectively and corrosive ingestion was mostly accidental among Nigerian adults. However, from both the studies it is evident that easy availability of the agent was an important factor for both suicidal and accidental cases. In this study none of the cases worked with acids and there was no occupational predisposition. Only 13.8% of the patients were given water in the acute phase and most people were not aware of the beneficial effect of drinking water in corrosive poisoning. Vomiting was attempted by 41.5% of the patients before coming to the health facility, which shows their ignorance to the danger caused by such practice in worsening of corrosive burns of the oesophagus. The outward passage of the corrosive may have worsened the ensuing strictures in them.

Almost all the patients were taken to a health facility within 2 to 5 hours of the incident. The early symptoms were pain and burning sensation in the mouth and throat. In the acute phase the patients were advised to have nothing per mouth and were treated with antibiotic and parenteral nutrition when brought to the health facility. Acute symptoms like peri-oral ulceration was present in 17 cases (26.15%), while aspiration pneumonitis was present in 7 cases (10.8%). Most (41.6%) of the patients attended this hospital after a period of 1 month of the injury. Dysphagia to solids was found to be the commonest presentation and was reported by 53.8% patients, followed by absolute dysphagia in the rest. Vomiting was present in cases of Gastric Outlet Obstruction.

There has been much controversy over the necessity of surgical correction in every case of corrosive poisoning, regardless of the amount of corrosive ingested, as also the optimum timing of intervention. Corroborative with the study of Oakes et al [4], our study revealed that the severity of burn was most apparent at the end of 3 weeks when dysphagia became a major problem and require certain interventions. In our hospital, feeding jejunostomy was done in all the cases at 2 to 3 weeks or later to maintain nutrition followed

by Barium meal at 6 weeks and decisions were taken accordingly. As shown by radiography long and short segment involvement was found to be almost equal among the cases. In most of the cases the upper 1/3 of the oesophagus was affected. Gastric outlet obstruction was present in 33.8% of the cases. For short segment involvement regular dilation ranging from 2 to 6 sittings were necessary and were done at an interval of 2 to 6 weeks. Self dilatation was helpful in patients. It was seen that in 19 cases (29.23%) the intervals of dilatations increased progressively with serial regular dilatations. Of the 2 cases (13.33%) that could not swallow even soft diet satisfactorily despite repeated dilatations were ultimately subjected to the colon-bypass procedure. Gastro jejunostomy was done in all cases of gastric outlet obstruction. For involvement of long segment, dilatation of the upper oesophagus was done to enable proper anastomosis followed by colon bypass. Maull & co-workers [5], John C & colleagues [6] and JK Park [7] carried out various operations among patients with oesophageal strictures and concluded that they can be performed safely, with acceptable long term functional results. These results were comparable to our study. In addition, laryngeal function was maintained without special treatment.

Post operative complications mainly occurred in the form of wound infections-13 cases (20%), oesophageal perforation 9 cases (13.8%) and anastomotic leak-4 cases (6.1%) and erosive ulcer at the site of feeding jejunostomy. Incidentally, esophageal perforation occurred during attempted dilatation of those cases which showed tight stricture of the esophagus. However, no major complications or death occurred among the patients. Common complications noted in our study were wound infections, oesophageal perforations and anastomotic leaks. Biswas et al [8] treated cases by gastrojejunostomy and esophageal dilatation, 4 weeks after ingestion of corrosive. The operative complications included mainly esophageal leak and perforation. The present study revealed that swallowing function improved with regular dilatations and post-operatively. John C et al [6] studied swallowing function and found it

to be excellent in 24% of cases, good in 66% and poor in 10%. J K Park [7] & co-workers also observed that after swallowing training for approximately 1 week, oral feeding could be resumed. The surgical procedure was shown to be safe and effective even in undernourished patients with diffuse esophageal stricture.

Ingestion of corrosives appear to be a common mode of deliberate self harm in developing countries, mostly in the urban areas where they are commonly used and are easily available. Banning such substances may be effective in particular areas for a particular period but it is difficult to predict the long term outcome since new poisons become popular replacing others.

So, long term improvement might come from reducing the incidence of harmful behavior and improving medical management. The occurrence of severe strictures, necessitating major operations could be reduced by early presentation to the health facility and proper management of corrosive oesophagitis at primary and secondary level of care. Improved mental health care, particularly at community level may play an important role to reduce suicidal attempts. Approaches may include increasing peoples' skill in coping with problems by providing coping skill classes at school and counseling in the community.

References

1. Murray CJL, Lopez AD. The global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2020. Global Burden of Disease and Injury Series. Volume.1. Cambridge MA. *Havard School of Public Health*, 1996.
2. Yusuf HR, Akhter HH, Rahman MH, Chowdhury MK, Rochat RW. Injury related deaths amongst women aged 10–50 years in Bangladesh, 1996–97. *Lancet* 2000; 355(9211): 1220-4.
3. Thomas MO, Ogunleye EO and Somefun O. Chemical injuries of the oesophagus: aetiopathological issues in Nigeria. *Journal of Cardiothoracic Surgery* 2009; 4(56): <http://www.cardiothoracicsurgery.org/content/4/1/56> doi: 10.1186/1749-8090-4-56 accessed on 18.2.11.
4. Oakes DD, Sherk JP., Mark JB; Lye ingestion-clinical patterns & therapeutic implications; *J Thorac Cardiovasc Surg*, 1982; 83(2): 194-204.
5. Maull KI, Scher LA, Greenfield LJ. Surgical implication of acid ingestion. *Surg Gynecol Obstet*, 1979; 148(6):895-898.
6. Wain JC, Wright CD, Kuo EY, Moncure AC, Wilkin EWJr, Grillo HC, Mathisen DJ. Long segment colon interposition for acquired esophageal disease; *Ann Thorac Surg*, 1999; 67(2): 313-318.
7. Park JK, Sim SB, LeeSH, Jeon HM, Kwack MS ; Pharyngo-enteral anastomosis for esophageal reconstruction in diffuse corrosive esophageal stricture. *Ann Thorac Surg*, 2001;72(4):1141-1143.
8. Biswas B, Dava S, Saha D, Saha PK, Roy GC, Roy M, Roy SC ; Study of muriatic acid injury of the Upper GI Tract in Eastern India. *Ind J Thoracic & Cardiovascular Surg*, 1992;8(2):152.

*All correspondences to: Dr. Indira Dey, 29 A, Kali Kumar Banerjee Lane, Kolkata-700002 West Bengal, India.
Email: indiradeypal@rediffmail.com