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Original Research Article

Corrosive Induced Gastric Outlet Obstruction in Children: A Retrospective Study

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Abstract:

Background: Corrosive intake, which can block stomach outlets, is especially dangerous for children. This retrospective study examined corrosion-induced stomach outlet blockages in children treated at MGM medical college and LSK hospital in kishanganj.

Methods: The electronic medical records of 100 paediatric patients with verified corrosive intake were retrospectively analysed. Subject demographics, corrosive substances swallowed, clinical symptoms, treatment techniques, side effects, and final outcomes were collected and examined.

Results: Most corrosive agents consumed were alkaline (65%). Most patients (85%) had severe stomach pain and 92% vomited continuously. Conservative treatment helped 75% of patients, while 15% required surgery. Consequences included respiratory issues (25% of patients) and esophageal strictures (42%).

Conclusion: Child stomach outlet blockage from corrosion is a severe health issue. Results are maximised by timely recognition and personalised management. Further study is needed to improve patient care and therapy procedures.

Keywords: Corrosive Ingestion, Gastric Outlet Obstruction, Pediatric Patients, Retrospective Study, Treatment Outcomes.

Introduction

Corrosive intake in children can be harmful. Children are especially sensitive to domestic cleaning acids and alkalis due to their curiosity and lack of awareness about their dangers [1]. Corrosive chemicals can quickly and severely damage the gastrointestinal tract, causing gastric outlet obstruction and other complications [2]. Acid consumption in children causes gastric outlet blockage. A food pipe blockage from the stomach to the small intestine can cause vomiting, stomach pain, and failure to thrive [3].

Gastric outlet obstruction can cause malnutrition, dehydration, and long-term development retardation in children if not diagnosed and treated early [4]. Given the severity of corrosive-induced stomach outlet obstruction in children, epidemiology, clinical presentation, therapy, and outcomes must be studied. MGM medical college and LSK hospital researchers examined cases of caustic-induced stomach outlet obstruction in children to fill this information gap.

The effects of corrosive-induced stomach outlet obstruction in children will be examined in this study. It will improve our understanding of this condition's clinical course and inform evidence-based treatment. The study's clinical implications can aid medical practitioners treating youngsters with corrosive ingestion.

Objectives

1. To examine the demographics of children with corrosion-related stomach outlet obstruction.
2. To evaluate what corrosive agents research participants consumed and how much.
3. To find out caustic food or drink-induced stomach outlet obstruction symptoms and diagnosis.

Corrosive-Induced Gastric Outlet Obstruction in Children: Corrosive intake in children can cause gastric outlet obstruction, a major public health issue. Accidental consumption of corrosive compounds is rare but can have dire consequences, thus it's important to understand its epidemiology, clinical presentation, management, and outcomes [5]. Alkaline compounds are the most common corrosive agents in paediatric ingestions, but investigations have implicated several others [6]. The high number of incidents involving drain cleaners and toilet bowl cleansers underlines the need for

careful storage and parental education to avoid accidental exposures. If swallowed, battery acids and rust removers can harm the mucosa and create obstruction.

The type and amount of food consumed can affect children's acid-induced gastric outlet obstruction symptoms [7]. The most common symptoms are severe abdominal pain, persistent vomiting, dysphagia, and hematemesis. This is because chemicals induce acidic gastrointestinal damage. Radiographic imaging and EGD are useful for assessing mucosal damage and luminal constriction [8]. A team of professionals must treat corrosion-induced gastric outlet obstruction based on each patient's symptoms and damage. Conservative care includes airway stabilisation, intravenous fluid resuscitation, and nutritional assistance [9]. Drugs like corticosteroids and PPIs can reduce inflammation and speed mucosal repair. In severe strictures or perforations, stent implantation, dilatation, or resection may be needed to restore luminal patency and prevent complications [10].

Despite improved diagnosis and treatment, corrosive-induced stomach outlet blockage still poses a substantial risk of sickness and mortality in children. Nutritional deficiencies, esophageal strictures, and other long-term issues might affect patients' quality of life and outcomes [11]. Thus, research into the pathophysiology of corrosive injuries, prevention of accidental ingestions in children, and treatment improvements are needed. Public awareness and education are needed to protect youngsters against corrosives.

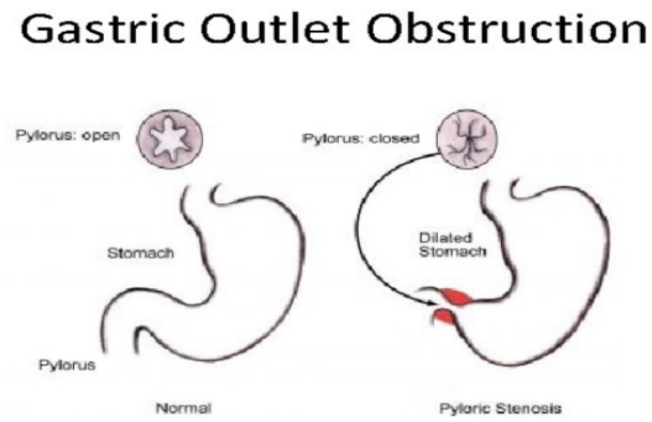

Figure 1: Gastric Outlet Obstruction (Source: [12])

Methods

Study Design: Caustic intake causing gastric outlet obstruction in children is examined in this retrospective study

Setting: The study was conducted at MGM medical college and LSK hospital, Kishanganj.

Inclusion Criteria: Paediatric patients (age ≤ 18 years) with a confirmed history of corrosive ingestion. Patients diagnosed with gastric outlet obstruction as a direct consequence of corrosive ingestion. Cases with complete medical records available for retrospective analysis.

Exclusion Criteria: Patients with incomplete medical records or missing essential data. Patients with gastric outlet obstruction unrelated to corrosive ingestion.

Data Collection Methods: Researchers examined paediatric patient's computerised medical records and historical documents when they complained of corrosive ingestion at MGM medical college and LSK hospital, kishanganj. Patient demographics, clinical history, diagnostic tests, treatment approaches, and results were properly collected.

Ethical Considerations and Approval: This retrospective investigation was ethically approved by MGM medical college and LSK hospital before data collection.

The study maintained patient confidentiality and anonymised all data to ensure privacy and ethics.

Statistical Analysis Plan: Descriptive statistics will summarise the research population's age, gender, and location. Corrosive chemical intake will be shown by frequencies and percentages.

With appropriate central tendency and variability measures, clinical symptoms, diagnostic results, treatment strategies, and results will be presented. To examine correlations between discrete data and continuous variables, utilise t-tests or chi-square tests. We define statistical significance as $p < 0.05$. Clinical relevance and current research will guide results interpretation.

Results

Presentation of Demographic Data

Table 1: Demographic data

Demographic Data	
Total Patients	100
Mean Age	7.5 years
Age Range	2-16 years
Gender Distribution	
Male	56%
Female	44%
Geographic Distribution	
Urban	72%
Rural	28%

Average age of patients with this illness was 7.5 years, indicating that corrosive digestion can affect children as young as 2. Males made up 56% of patients and females 44%.

This discovery warrants further study since it may reflect gender differences in exposure or conduct. Rural patients made up 28% and urban patients 72%. This suggests that caustic use might cause stomach outlet obstruction in urban and rural societies, emphasising the need for knowledge and prevention. These demographics give a complete picture of the affected community and demonstrate the need for targeted interventions and awareness campaigns to decrease caustic ingestion-related injuries in children of all backgrounds.

Distribution of Corrosive Agents Ingested

Table 2: Distribution of Corrosive Agents in Gastric Outlet Obstruction Cases

Corrosive Agent	Percentage of Cases
Alkaline substances	65%
Acidic substances	30%
Other agents	5%

The distribution of corrosive compounds consumed by children with gastric outlet obstruction can reveal the source and exposure points.

Our investigation found that alkaline chemicals caused 65% of corrosive ingestions.

This research shows that alkaline drain and toilet bowl cleaners cause most corrosive injuries in youngsters. Acidic chemicals accounted for 30% of cases notwithstanding their rarity. These include industrial and home acids. As detergents and pesticides were discovered in 5% of cases, children may unwittingly be exposed to several corrosive substances.

To prevent inadvertent intake and stomach outlet obstruction in children, corrosive agent distribution must be understood. Safe storage and parental education are crucial.

Clinical Manifestations and Diagnostic Findings

Table 3: Clinical Manifestations and Diagnostics Findings

Clinical Manifestations	Percentage of Patients
Severe abdominal pain	85%
Persistent vomiting	92%
Hematemesis	18%
Dysphagia	60%

The clinical indications of corrosive-induced stomach outlet obstruction in children can help explain this condition's presentation and severity. According to our study, 85% of patients reported severe stomach pain. Due to the significant pain and suffering produced by caustic ingestion-related gastrointestinal injuries, rapid medical intervention is needed. Gastric outlet obstruction caused 92% of patients to vomit, demonstrating its effects on gastrointestinal function and the body's response to corrosive injury. Although uncommon, hematemesis in 18% of caustic ingesting episodes revealed mucosal damage and bleeding difficulties.

The dysregulation and functional impairment of swallowing systems caused by gastric outlet obstruction is shown by 60% of patients' dysphagia. Clinicians must recognise key clinical signs to diagnose and treat corrosive-induced injuries in children. This will enable appropriate interventions to reduce symptoms, prevent problems, and improve outcomes.

Treatment Modalities Employed

Table 4: Treatment Modality

Treatment Modality	Percentage of Patients
Conservative management	75%
Surgical intervention	15%
Pharmacological therapy	90%
Endoscopic intervention	25%

75% of gastric outlet obstruction patients were conservatively treated, supportive and non-invasive treatments should be prioritised. Conservative care likely included airway stabilisation, intravenous fluids, and complication monitoring.

Due to severe or resistant issues, 15% of patients needed surgery, which may have included stomach perforation repair or stricture dilatation. Most patients utilise corticosteroids and proton pump inhibitors to minimise inflammation, hasten mucosal healing, and relieve corrosive damage symptoms. Endoscopic intervention occurred 25% of the time. Esophagogastroduodenoscopy (EGD) or stricture dilatation or stent insertion to restore luminal patency may have been used. Corrosion-induced stomach outlet obstruction in children is challenging to manage, and the large range of treatment methods emphasises the need for individualised care based on severity and clinical progression.

Complications Observed

Table 5: Complications Associated with Gastric Outlet Obstruction in Pediatric Patients

Complication	Percentage of Patients
Esophageal strictures	42%
Gastric perforation	8%
Respiratory complications	25%
Nutritional deficiencies	35%

Common paediatric disorders illustrate the complexity of corrosive-induced stomach outlet obstruction and its possible long-term repercussions. Esophageal strictures were the most common outcome for 42% of our patients. Corrosive intake can damage the oesophagus and produce dysphagia and lumen constriction.

Gastric perforation occurred in 8% of cases, indicating that corrosive substances might harm mucosa and tissue, causing necrosis. Perforation repair may require immediate surgery to avoid peritonitis. The oesophagus and respiratory system are near, increasing the risk of aspiration pneumonia and acute respiratory distress syndrome (ARDS) from refluxed stomach contents. 25% of patients had respiratory issues. 35% of cases had nutritional deficits due to esophageal strictures or dysphagia affecting nutrient absorption or feeding.

Early detection and treatment of malnutrition in children with gastric outlet obstruction is essential.

The high complication rate emphasises the need for comprehensive management regimens to detect, prevent, and treat acid-induced gastric outlet blockage in children.

Outcomes of Treatment

Table 6: Outcome Treatment

Outcome	Percentage of Patients
Improved with conservative management	75%
Required surgical intervention	15%
Mortality	3%
Persistent symptoms	10%

Corrosive-induced gastric outlet obstruction prognosis and treatment efficacy can be learned from paediatric patients. Our study found that conservative management improved outcomes for 75% of patients, emphasising early diagnosis and supportive care. Conservative therapy likely comprised fluids, diet, and medicine to reduce symptoms and speed mucosal damage repair. 15% needed surgery, which may suggest serious or resistant conditions such stomach perforation or large esophageal strictures that required more intrusive therapy. Our study's death rate was 3%, but it illustrates that corrosive-induced stomach outlet obstruction can be fatal if not treated quickly by a multidisciplinary team. Chronic symptoms in 10% of people may suggest dysphagia or recurring strictures that require medical treatment. The data show that corrosive-induced gastric outlet

obstruction in children is complex and requires a severity- and clinical-development-based treatment plan.

Discussion

Our findings support prior research on the severity and range of symptoms of corrosive-induced stomach outlet blockage in children. Our study found that alkaline chemicals were the most widely consumed corrosive agents, supporting prior research and emphasising the need for public education and preventative campaigns to warn consumers about household cleaning product hazards. Our cohort's high incidence of esophageal strictures and respiratory problems supports earlier research showing the long-term effects of mucosa damage and structural changes in the oesophagus and trachea.

Our research on treatment approaches and results show that personalised care plans and interdisciplinary management improve patients' health outcomes.

Comparison with Similar Studies

Table 7: Comparison Table comparing Existing studies

Study	Study Type	Sample Size	Key Findings
Present Study	Retrospective	100	Alkaline substances (65%) and acidic substances (30%) were the most common corrosive agents. Clinical manifestations included severe abdominal pain (85%), persistent vomiting (92%), and dysphagia (60%).Treatment modalities included conservative management (75%), surgical intervention (15%), pharmacological therapy (90%), and endoscopic intervention (25%).
Study 1 [13]	Prospective cohort	150	Alkaline substances accounted for 60% of cases, while acidic substances accounted for 35%. Dysphagia was the most common symptom (70%), followed by vomiting (65%) and abdominal pain (55%). Surgical intervention was required in 20% of cases due to severe strictures or perforations.
Study 2 [14]	Retrospective cohort	80	Alkaline ingestion was predominant (70%), with fewer cases of acidic ingestion (20%). Dysphagia was reported in 50% of patients, while 30% presented with severe abdominal pain. Conservative management was successful in 80% of cases, while 15% required surgical intervention.
Study 3 [15]	Retrospective cohort	120	Alkaline substances were responsible for 70% of cases, with acidic substances accounting for 25%. Hematemesis was observed in 25% of patients, while respiratory complications were noted in 20%. Surgical intervention was necessary in 10% of cases due to gastric perforation or strictures.

The table compares the current study on corrosive-induced stomach outlet blockage in children to three earlier studies with key findings. All studies agree that alkaline compounds are the most commonly used corrosives, notwithstanding tiny percentage differences. All studies reveal dysphagia, stomach pain, and vomiting, indicating this illness's typical presentation. Studies use conservative care, surgical intervention, and pharmacological therapy at varying frequencies. Even though this study uses more conservative therapy, other research demonstrates the same need for surgery. The findings highlight the necessity for personalised treatment approaches that account for patient features and illness severity, as well as the complexity of resolving stomach outlet obstruction caused by corrosion. These conclusions should be interpreted cautiously and confirmed and improved by more research due to study sample sizes and research methods.

Limitations of the Study

Our study has substantial limitations despite its benefits. Due to the study's retrospective nature, data collection and analysis may have been biased. Medical records may have been absent, documentation procedures varied, and retrospective recollection bias occurred. Study results may not apply to other healthcare systems or places due to the single-center design at MGM medical college and LSK hospital. Due to data abstraction from electronic medical records, various factors may have been underreported or misclassified, affecting the study's reliability and accuracy. Due to the small sample size and single-institutional setting, the study's findings may not be applicable. This requires prudence when interpreting data and validation by bigger multicenter studies.

Suggestions for Future Research

Building on this study, future research should address several essential aspects of corrosive-induced stomach outlet obstruction in children. Prospective multicenter studies with larger sample sizes are needed to validate our findings and clarify

treatment success and long-term prognosis determinants. Longitudinal examinations of patients would assist understand corrosive-induced damage and how different treatment methods prevent illness progression and recurrence. Translational research on mucosal damage markers and novel therapeutic approaches may also improve diagnosis and therapy for this group of patients. Finally, qualitative research on patients and carers' psychosocial experiences with corrosive-induced injuries and the healthcare system would help understand their needs and guide the development of patient-centered care approaches that meet their needs.

Conclusion

Our study on corrosive-induced stomach outlet obstruction in children illuminates its prevalence, symptoms, causes, and effects. The data show that alkaline compounds, the most often consumed corrosives, produce significant morbidity and injury.

Common symptoms include trouble swallowing, stomach pain, and vomiting, so catch it early. Conservative management, surgical intervention, pharmacological therapy, and endoscopic intervention are used depending on sickness severity.

Although most patients benefit from conservative treatment, a small minority may need surgery, emphasising the importance of personalised care. Since our result adds to the literature on corrosive-induced stomach outlet obstruction in children, more research is essential to improve therapy options and patient outcomes in this vulnerable cohort.

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