Section: Surgery

Original Research Article

EPIDEMIOLOGICAL AND CLINICAL INSIGHTS INTO GASTRO-DUODENAL PERFORATION: A PROSPECTIVE STUDY FROM NORTHEAST INDIA

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Received *: 07/10/2025*
Received in revised form *: 14/11/2025*
Accepted *: 02/12/2025*

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DOI: 10.70034/ijmedph.2025.4.534

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2025; 15 (4); 2980-2988

ABSTRACT

Background: Gastrointestinal perforation, a complete breach in the wall of the stomach or intestines leading to peritoneal contamination, is a life-threatening surgical emergency requiring prompt diagnosis and management. Despite advances in medical care and surgical techniques, gastrointestinal perforations remain associated with high morbidity and mortality, particularly in tropical countries such as India. This study aims to evaluate the risk factors and clinical features associated with gastro-duodenal perforation among patients undergoing emergency exploratory laparotomy at the Regional Institute of Medical Sciences (RIMS), Imphal, Manipur.

Materials and Methods: A prospective observational study was conducted over two years, including 86 patients diagnosed with gastro-duodenal perforation who underwent emergency laparotomy. Data were collected on demographic details, risk factors (smoking, alcohol, NSAID use, diet, blood group), comorbidities, clinical presentation, and intraoperative findings.

Results: Most patients were in the 4th to 6th decades of life, with a male predominance. Smoking, alcohol intake, NSAID abuse, and non-vegetarian diet emerged as significant risk factors. A majority of patients had O positive blood group and associated comorbidities such as diabetes and hypertension. Clinical presentations included guarding, abdominal tenderness, liver dullness, altered bowel habits, abdominal distension, fever, and septicemia. These findings align with existing literature and highlight similarities in clinical patterns across various regions in India.

Conclusion: The clinical profile and risk factors of gastro-duodenal perforation in northeastern India mirror national trends. Early identification of risk factors and clinical features is essential for improving surgical outcomes in affected patients.

Keywords: Gastrointestinal perforation, gastro-duodenal perforation, emergency laparotomy, risk factors, NSAID, smoking, septicemia, clinical features, northeastern India.

INTRODUCTION

Perforation refers to the abnormal breach in the continuity of a hollow organ or viscus, and the term is derived from the Latin word perforatus, meaning "to bore through".[1] Gastrointestinal perforation specifically denotes the complete penetration of the stomach or intestinal wall, allowing the contents of the gastrointestinal tract to spill into the peritoneal cavity.[2] This leakage initially causes chemical peritonitis, which is subsequently followed by bacterial contamination of the peritoneal cavity. Gastrointestinal perforation is a well-recognized surgical emergency across the globe, including in India.[3,4] Despite significant advancements in critical care such as intensive care unit (ICU) support, antimicrobial therapy, and the emergence of newer surgical modalities including endoscopy,

laparoscopy, and laparoscopy-assisted procedures in place of conventional laparotomy, managing gastric and colorectal perforations continues to pose a significant challenge to clinicians worldwide.[3-5] High rates of morbidity and mortality remain persistent concerns.[1]

The incidence, etiology, and clinical outcomes of perforation-related acute abdominal emergencies often differ in tropical countries compared to Western settings.[1,6] In the Indian subcontinent, upper gastrointestinal tract perforations dominate and typically present with generalized peritonitis, purulent contamination, and varying degrees of septicemia.[1,7] These cases often involve elderly individuals, frequently aged 60 years and above, many of whom have severe coexisting medical conditions and compromised physiological status.[7] Additionally, factors such as prolonged steroid use and immunosuppressive therapy may exacerbate the disease severity.[8]

Gastric perforations may occur spontaneously or result from trauma. Most cases are due to spontaneous perforations secondary to peptic ulcer disease (PUD), although less common etiologies are also documented. The two primary contributors to PUD include the use of non-steroidal anti-inflammatory drugs (NSAIDs) and infection with Helicobacter pylori (H. pylori). Other contributing factors include smoking, chronic liver disease, chronic renal failure (particularly among those on dialysis or post-transplant), and hyperparathyroidism. The overall incidence of PUD is estimated at approximately 1.5% to 3%, with a lifetime risk of perforation around 5%, and associated mortality ranging from 1.3% to 25%.

Among individuals under 40 years of age, duodenal ulcers are four times more prevalent than gastric ulcers and are more commonly seen in men. In contrast, benign gastric ulcers are frequently observed in the elderly and are typically located on the lesser curvature of the stomach. Ulcers found on the greater curvature, fundus, and antrum may suggest malignancy. Early and accurate diagnosis followed by prompt surgical intervention is vital in cases of gastro-duodenal perforation. Effective surgical source control remains the cornerstone of successful management and should be prioritized above all therapeutic measures. Importantly, mortality escalates with prolonged delays between the onset of perforation and surgical intervention.[9]

Although antimicrobial regimens, H_2 receptor blockers, and proton pump inhibitors have markedly reduced peptic ulcer recurrence, the incidence of complications such as perforation remains high—especially among elderly patients. This increase is likely linked to widespread NSAID and aspirin use, both of which are well-documented risk factors for peptic ulcer disease in a dose-dependent manner. Other known causes of gastrointestinal perforation include trauma, enteric fever, appendicular perforation, tuberculosis, malignancy, foreign body ingestion, and iatrogenic injuries.[10] Traumatic gastroduodenal perforations are rare, constituting only 5.3% of all blunt hollow organ injuries, yet they are associated with significant complication rates of 27–28%. Malignancy-related perforation can result from either obstruction leading to elevated luminal pressure or post-treatment regression of transmural tumors. Perforations caused by foreign body ingestion—whether intentional or accidental—can result from direct mucosal injury or from obstruction. Additionally, iatrogenic perforations are increasingly common due to the rising use of diagnostic and therapeutic procedures such as esophagoduodenoscopy. Other procedures linked to gastroduodenal perforation include inferior vena cava filter placements, ERCP, and biliary stenting.[6]

Patients with gastrointestinal perforations typically present with abdominal pain, vomiting, distension, fever, and signs of shock.[11] Although such cases are frequently encountered in India, data specific to the northeastern region of the country, including Manipur, remain limited. This study was thus undertaken to assess the risk factors and clinical features of gastro-duodenal perforations at the Regional Institute of Medical Sciences, Imphal, Manipur The aim of the current study is to determine the risk factors and clinical features of gastroduodenal perforation.

MATERIALS AND METHODS

Study Design: This was a hospital-based cross-sectional study conducted over a period of two years. The aim was to evaluate the clinical profile and etiological spectrum of gastro-duodenal perforations among patients who underwent emergency exploratory laparotomy.

Study Setting: The study was carried out in the Department of Surgery, Regional Institute of Medical Sciences (RIMS), Imphal, Manipur, a tertiary care teaching hospital catering to a large population of Northeast India.

Study Duration: The research was conducted over a span of two years, beginning in December 2020 and concluding in November 2022.

Study Population: The study included all patients who were diagnosed with gastro-duodenal perforation and underwent emergency exploratory laparotomy in the Department of Surgery at RIMS during the study period. These patients formed the basis of our study population.

Inclusion Criteria

Participants were included in the study if they met the following criteria:

- Patients aged between 18 and 70 years.
- Patients who were intraoperatively confirmed to have gastro-duodenal perforation and underwent emergency exploratory laparotomy.

Exclusion Criteria

Patients were excluded from the study if they met any of the following conditions:

- Patients requiring intensive care unit (ICU) admission.

- Patients who were unwilling to provide informed consent for participation in the study.

Sample Size Estimation

The required sample size (N) was calculated using the formula for a single population proportion:

N=4PQ/L2

Where:

- P is the estimated proportion of peptic ulcer disease causing duodenal perforation, taken as 88% based on the study by Sreelaxmi et al., titled "Clinical Study and Management of Gastric Perforation".
- Q = 100 – P = 12
- L, the absolute allowable error, was taken as 7%.

Substituting the values:

N=4×88×1272=422449

724×88×12=494224=86.2

Thus, a total of 86 patients were included in the study.

Sampling Technique: A convenience sampling technique was employed, enrolling all eligible patients presenting during the study period who fulfilled the inclusion criteria.

Study variables: The study encompassed a range of both independent and dependent variables to comprehensively evaluate the clinical and etiological profile of gastro-duodenal perforations. The independent variables included a variety of demographic and clinical factors such as age and sex, as well as lifestyle-related aspects like alcohol consumption, smoking habits, and food habits. The use of non-steroidal anti-inflammatory drugs (NSAIDs) was also considered, given their well-established role in gastrointestinal mucosal injury. Additional variables assessed included blood group, history of peptic ulcer disease, and the presence of co-morbid conditions, all of which could influence the risk and presentation of perforation. Furthermore, cases involving trauma, corrosive ingestion, and clinical evidence of sepsis were also carefully evaluated as potential contributing factors.

The dependent variables, or outcome measures, primarily focused on the clinical features at the time of presentation, such as abdominal pain, signs of peritonitis, fever, and hemodynamic instability, among others. Additionally, the etiological classification of gastro-duodenal perforation was analyzed to determine the underlying cause—whether peptic ulcer disease, trauma, corrosive ingestion, or other less common etiologies. These variables collectively enabled a detailed assessment of the patterns and possible risk factors associated with gastro-duodenal perforation in the study population.

Operational Definition: Gastroduodenal Perforation: Defined as a full-thickness discontinuity in the wall of the gastrointestinal tract, specifically involving the stomach or duodenum, leading to the leakage of gastrointestinal contents into the peritoneal cavity, necessitating urgent surgical intervention.

Data collection: Data collection for the study was carried out using a pre-designed and pre-tested research proforma, specifically developed to ensure uniformity and completeness in data acquisition. This structured tool was employed to systematically record information from each patient enrolled in the study. Detailed demographic data, clinical history, and findings from a comprehensive physical examination were meticulously documented. Additionally, intraoperative findings obtained during emergency exploratory laparotomy were carefully noted to confirm the presence and location of the gastric or duodenal perforation. All data were collected prospectively throughout the study duration, ensuring real-time entry and minimizing recall bias. This methodological approach facilitated the accurate and consistent documentation of relevant clinical and operative variables for subsequent analysis.

Statistical Analysis: Statistical analysis for the study was conducted using SPSS (Statistical Package for the Social Sciences), version 21.0. Prior to analysis, all collected data were thoroughly scrutinized for completeness and accuracy. Graphs and tables were generated using Microsoft Word and Microsoft Excel to facilitate the presentation of results. Continuous or numerical variables that followed a normal distribution were summarized using mean ± standard deviation (SD). Categorical variables were presented as frequencies and percentages. Descriptive statistics—including means, standard deviations, and proportions—were calculated to comprehensively describe the demographic characteristics and clinical profiles of the study population.

Ethical Considerations: This study was conducted only after obtaining ethical clearance from the Research Ethics Board, Regional Institute of Medical Sciences, Imphal (Reference No: …….). Written informed consent was obtained from all participants prior to enrollment. They were adequately informed about the nature, purpose, risks, and benefits of the study in a language they could understand.

Participants were assured of:

- Voluntary participation
- The right to withdraw at any time without prejudice to their treatment
- Confidentiality of all data collected.

RESULTS

The present study included 86 patients with gastrointestinal perforation who underwent emergency exploratory laparotomy. The data was collected over a period of twenty four months, from December 2020 to November 2022. The study was conducted in the department of General Surgery, RIMS Hospital, Imphal. After taking the proposed informed consent, data was collected using the pre-tested pre-designed proforma.

Data collected includes age, sex, alcohol habits, NSAIDS use, smoking habits, food habits, blood group, sepsis, history of peptic ulcer disease, trauma,

corrosive ingestion, co morbid conditions, etiology of gastro duodenal perforation and its clinical features.

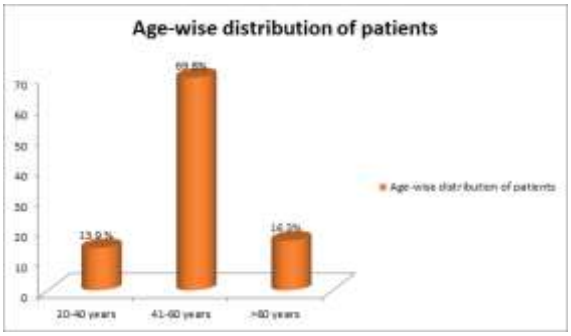

Figure 1: Age-wise distribution of gastrointestinal perforation patients

During the study period, 86 patients underwent emergency exploratory laparotomy, out of which 69.8% belonged to the age group of 41 -60 years, 16.3% were above 60 years of age and only 13.9% belonged to the age group of 20-40 years as shown in figure 1. The mean age of the patients was 50.09±10.12 years.

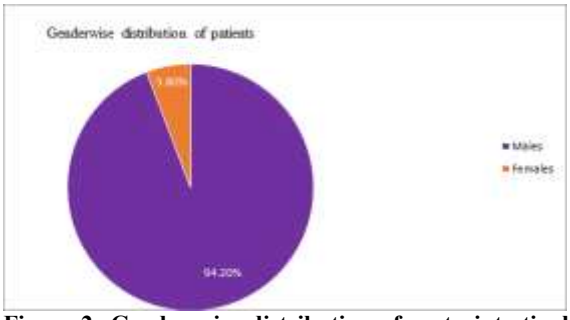

Figure 2: Gender-wise distribution of gastrointestinal perforation patients

Majority of the gastrointestinal perforation patients who were part of the present study were males (94.2%) as shown in figure 2. Only 5.8% of the patients belonged to female gender.

Table 1: Distribution of patients according to religion

Religion	No. of patients	Percentage
Hindu	41	47.7
Muslim	28	32.6
Christian	17	19.8
Total	86	100

Majority of the patients belonged to hindu religion (47.7%) as per table 1. 32.6% of the gastrointestinal patients were muslims and remaining 19.8% were Christians.

Table 2: Predisposing factors for peptic ulcer disease

Predisposing factors		No. of patients	Percentage
Alcohol intake	Yes	22	25.6
	No	64	74.4
	Total	86	100
NSAID use	Yes	6	7
	No	80	93
	Total	86	100
Smoker	Yes	29	33.7
	No	57	66.3
	Total	86	100

As per [Table 2], 33.7% of the gastrointestinal perforation patients were smokers. 25.6% of the patients were consuming alcohol in different forms. Only 7% of the patients claimed to be using NSAIDs.

Table 3: Distribution of patients according to food habits

Food habits	No. of patients	Percentage
Vegetarian	0	0
Non-vegetarian	86	100
Total	86	100

As shown in [Table 3], all the patients were non-vegetarians.

Table 4: Distribution of patients according to their blood group

Blood group	No. of patients	Percentage
A positive	6	7
AB positive	4	4.7
B positive	11	12.8
O positive	65	75.6
Total	86	100

As per [Table 4], majority of the gastrointestinal perforation patients had O positive blood group (75.6%). 12.8% of them had B positive blood group, 7% patients were A positive. Only 4.7% of the patients had AB positive blood group.

Table 5: Distribution of patients according to their comorbidities

Comorbidities	No. of patients	Percentage
Bronchial asthma	1	1.2
Chronic kidney disease	1	1.2
Hydrocele	1	1.2
Hypertension	15	17.4
Hypothyroid	1	1.2
Left renal calculi	1	1.2
Type 2 diabetes mellitus	15	17.4
None	51	59.3
Total	86	100

[Table 5] shows that majority (59.3%) of the gastrointestinal perforation patients had no comorbidities. 17.4% of the patients were having type 2 diabetes mellitus and another 17.4% of the patients were hypertensives. Bronchial asthma (1.2%), chronic kidney disease (1.2%), hydrocele (1.2%), hypothyroidism (1.2%) and left renal calculi (1.2%) were the other comorbidities among the remaining patients who were part of the study.

Table 6: Spectrum of etiology among the patients

Etiology		No. of patients	Percentage
Peptic ulcer disease	Yes	10	11.6
	No	76	88.4
	Total	86	100
Trauma	Yes	0	0
	No	86	100
	Total	86	100
Corrosive ingestion	Yes	1	1.2
	No	85	98.8
	Total	86	100

As per [Table 6], 11.6% of the gastrointestinal peroration patients were found to be having a history of peptic ulcer disease. Only 1.2% of the patients had a history of corrosive ingestion. No patients had history of traumatic injury.

Table 7: Clinical features of gastrointestinal perforation patients

Clinical features		No. of patients	Percentage
Tenderness	Present	86	100
	Absent	0	0
	Total	86	100
Guarding	Present	86	100
	Absent	0	0
	Total	86	100
Liver dullness	Present	85	98.8
	Absent	1	1.2
	Total	86	100
Bowel sounds	Present	2	2.3
	Absent	84	97.7
	Total	86	100
Abdominal distension	Present	78	90.7
	Absent	8	9.3
	Total	86	100
Altered bowel habits	Present	79	91.9
	Absent	7	8.1
	Total	86	100
Nausea	Present	78	90.7
	Absent	8	9.3
	Total	86	100
Vomiting	Present	78	90.7
	Absent	8	9.3
	Total	86	100
Fever	Present	75	87.2
	Absent	11	12.8
	Total	86	100

[Table 7] shows that all the patients had guarding and tenderness. 98.8% of the patients showed the presence of liver dullness. 91.9% of the patients were found to be having altered bowel habits. Abdominal distension, nausea and vomiting were present in 90.7%. 87.2% of the patients had developed fever. Bowel sounds could be auscultated in only 2.3% of the patients.

Table 8: Postoperative complications

Complications		No. of patients	Percentage
Septicemia	Yes	74	86
	No	12	14
	Total	86	100

As shown in [Table 8], majority (86%) of the gastrointestinal perforation patients had developed septicemia of varying degrees of severity following the emergency exploratory laparotomy procedure.

DISCUSSION

Gastrointestinal perforation refers to the complete breach of the stomach or intestinal wall, resulting in the leakage of luminal contents into the peritoneal cavity, often leading to life-threatening peritonitis and systemic sepsis if not managed promptly.[2] Perforation peritonitis commonly arises as a consequence of a perforated, diseased viscus.[23] The current study was undertaken with the objective of identifying the associated risk factors and presenting clinical features of gastro-duodenal perforations. It was conducted over a two-year period in the Department of Surgery at the Regional Institute of Medical Sciences (RIMS), Imphal, Manipur, and involved a total of 86 patients who underwent emergency exploratory laparotomy. Patients requiring intensive care unit (ICU) management were excluded from the study to maintain uniformity in the surgical and clinical profiles being analyzed.

The mean age of the study population was 50.09 ± 10.12 years. A significant majority (69.8%) of patients fell within the 41–60 years age group, while 16.3% were above 60 years, and only 13.9% were between 20 and 40 years of age. These observations are consistent with the findings of Sreelaxmi et al,[22] who noted a predominance of gastric perforations in individuals aged 40–70 years. Similarly, Goel A et al,[24] reported a peak incidence in the 41–50-year age bracket in a study conducted in Agra. Conversely, Das PK et al,[2] at Dhaka Medical College Hospital and Patel AK et al,[25] at Kamineni Institute of Medical Sciences, Telangana, found gastrointestinal perforations to be more frequent among younger individuals aged 31–40 years, with a mean age of 35 years, and over 91% of cases under 50 years. This age group represents the economically productive population, underscoring the potential socioeconomic impact of the condition.

A clear male predominance was observed in the current study, with 94.2% of the cases being male and only 5.8% female [Figure 2]. These figures align with previous reports by Das PK et al,[2] who recorded a male-to-female ratio of 88% to 12%, and Hameed T et al,[26] who found 76.5% of patients were male and 23.5% female. This gender disparity may be attributed to differences in lifestyle factors such as occupational stress, financial responsibilities, smoking, and alcohol consumption, which are more prevalent among males in various cultural settings.

In the current study, 33.7% of patients were smokers and 25.6% consumed alcohol in various forms. These findings are in line with those of Patil R et al,[27] who reported that 40% of duodenal ulcer perforation cases were smokers and 30% were alcohol users. Studies by Thirupathaiah K et al,[28] and Ugochukwu AI,[29] also demonstrated a strong association between substance use and gastrointestinal perforations, particularly among younger populations in developing countries. These observations support the hypothesis that tobacco and alcohol are significant contributory risk factors in the pathogenesis of gastro-duodenal perforation.

In contrast, the use of non-steroidal anti-inflammatory drugs (NSAIDs) was reported in only 7% of the study participants. This is comparatively lower than findings from other regions; for instance, a study from Gulbarga, Karnataka, reported NSAID usage in 26.7% of perforation cases,[27] while a study in Jaipur indicated a rate of 15.2%.[30] Furthermore, Ekka NMP et al,[31] noted a significantly higher NSAID use rate of 46.15% among patients in Ranchi. These differences may reflect regional variations in prescribing habits, availability of over-the-counter medications, and public awareness regarding NSAID-associated risks.

All the patients in the present study were non-vegetarians, as documented in Table 3. This dietary pattern has also been associated with a higher incidence of gastrointestinal perforations in several studies. Sarda DK et al,[32] in their study conducted in Rajasthan, reported a high perforation incidence (84.8%) among non-vegetarians. This trend was similarly observed by Chouhan D et al,[33] and Singh LO et al,[34] suggesting a potential link between non-vegetarian dietary practices and increased gastrointestinal risk.

An analysis of blood group distribution revealed that 75.6% of patients had O positive blood group, followed by B positive (12.8%), A positive (7%), and AB positive (4.7%). This pattern is in agreement with findings from studies by Evans DAP,[35] and Edgren G,[36] which noted a higher frequency of gastric perforations in individuals with O blood group. However, an exception to this trend was noted by Sureshkumar B,[37] who reported that in Vellore, 70% of patients with gastric perforations belonged to blood group A, with only 20% being O group, suggesting geographical and genetic variations in blood group distribution and disease susceptibility.

In the current study, 40.3% of patients had co-morbid conditions. Among them, 17.4% had type 2 diabetes mellitus, and an equal proportion had hypertension. Other comorbidities included bronchial asthma, chronic kidney disease, hypothyroidism, hydrocele, and renal calculi, each constituting 1.2% of the

cohort. These findings corroborate those reported by Christensen S,[38] Unver M,[39] Dadfar A,[40] and Sivaram P,[41] who emphasized the impact of comorbidities on the clinical outcomes of gastrointestinal perforations. Wysocki P,[42] further noted a median number of three comorbidities per patient, highlighting the multifactorial nature of risk in these cases.

Despite the well-established link between peptic ulcer disease and perforation, only 11.6% of patients in the present study reported a prior history of peptic ulcer disease. Furthermore, 1.2% had a history of corrosive ingestion, and none had a history of trauma as a contributing factor. These findings are consistent with those reported by Hota PK,[1] suggesting that many cases of perforation may present de novo, without a previously known history of ulcer disease.

With respect to clinical presentation, all patients demonstrated guarding and tenderness on abdominal examination. Additionally, 98.8% exhibited liver dullness, 91.9% had altered bowel habits, and 90.7% experienced abdominal distension, nausea, and vomiting. A high proportion (87.2%) developed fever, while only 2.3% had audible bowel sounds. These findings are in close agreement with observations made by Garg R,[43] Khalaf ZA,[44] Gona SK,[45] Sharma S,[46] Vyas AK,[47] Mahesh SV,[48] Ali AM,[49] and Neupane S,[50] who reported similar clinical features among patients presenting with gastro-duodenal perforations.

Finally, a significant proportion (86%) of patients had clinical evidence of septicemia of varying severity prior to undergoing emergency surgery. This observation supports findings by Singh A,[51] who also reported a high prevalence of sepsis in perforation cases. The presence of preoperative sepsis and associated comorbidities has important implications for surgical outcomes, postoperative recovery, and overall mortality, underscoring the need for timely diagnosis and comprehensive perioperative care in such patients.

Strengths and Limitations: The study's strengths lie in its prospective design, standardized data collection using a pre-tested proforma, and focused analysis of multiple risk factors and clinical presentations of gastro-duodenal perforations. Conducted at a tertiary care center, it provides region-specific insights into the condition. However, limitations include the relatively small sample size and exclusion of critically ill patients requiring ICU care, which may limit the generalizability of findings. Additionally, reliance on patient-reported history for lifestyle factors like smoking, alcohol use, and NSAID intake introduces the possibility of recall bias, potentially affecting the accuracy of certain variables.

CONCLUSION

The present cross-sectional study, conducted at the Department of Surgery, Regional Institute of Medical Sciences (RIMS), Imphal, Manipur, over a two-year period, aimed to analyze the risk factors and clinical features of gastro-duodenal perforations among patients who underwent emergency exploratory laparotomy. A total of 86 patients diagnosed with gastro-duodenal perforation were included. The demographic profile revealed that a significant majority of these patients were in their fourth, fifth, and sixth decades of life. Specifically, the age group of 41–60 years accounted for the largest proportion of cases, followed by those above 60 years, with a smaller representation from the younger age group of 20–40 years. This age distribution suggests that gastro-duodenal perforation predominantly affects the middle-aged and elderly population, which aligns with observations from similar studies conducted in other regions of India.

Gender distribution in this study was markedly skewed, with males comprising 94.2% of the cases. This male predominance may be attributed to greater exposure to certain lifestyle-related risk factors such as smoking, alcohol consumption, and higher levels of occupational or psychosocial stress, which are more prevalent among men in many parts of the country.

A detailed analysis of lifestyle factors revealed that 33.7% of the patients were habitual smokers, and 25.6% had a history of alcohol consumption. These habits are well-known contributors to peptic ulcer disease, which often precedes perforation. Smoking is known to delay gastric mucosal healing and increase acid secretion, while alcohol can cause mucosal injury and enhance the risk of ulcer formation. The role of NSAIDs was also evident, with 7% of the patients reporting usage. Although this percentage appears modest compared to other regional studies, the ulcerogenic potential of NSAIDs is well-documented, especially in the absence of gastro-protective agents.

All patients in this study were non-vegetarians, suggesting a potential dietary influence on the development of peptic ulcer disease and perforation. Non-vegetarian diets, particularly those high in spice, fat, and protein, may stimulate excessive gastric acid secretion, contributing to mucosal damage.

Interestingly, 75.6% of the patients had O positive blood group. This finding aligns with previous studies suggesting a potential link between blood group O and increased susceptibility to peptic ulcers. Additionally, 40.3% of patients presented with co-morbidities such as type 2 diabetes mellitus, hypertension, chronic kidney disease, and asthma. These co-existing conditions can complicate the clinical course, delay healing, and increase the risk of morbidity.

Clinically, all patients exhibited guarding and tenderness on abdominal examination, classic signs of peritonitis. Additional symptoms included liver dullness (98.8%), altered bowel habits (91.9%), abdominal distension, nausea, vomiting (90.7%), and fever (87.2%). The majority (86%) also showed signs of septicemia at the time of presentation, indicating the severity and systemic impact of the disease.

In conclusion, the findings of this study reveal that the risk factors and clinical features of gastro-duodenal perforation in the RIMS population closely mirror patterns observed across other regions of India. Middle-aged males with habits such as smoking, alcohol use, and non-vegetarian dietary preferences, especially those with O positive blood group and comorbidities, appear to be at higher risk. Prompt diagnosis and surgical intervention remain critical in managing this potentially life-threatening condition.

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