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RISK FACTORS AND PROGNOSTIC DETERMINANTS OF DUODENAL ULCER PERFORATION.

General Surgery

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ABSTRACT

Background: Duodenal ulcer perforation (DUP) is one of the most common acute-abdominal emergencies in the field of general surgery. It is associated with mortality rates. Studies have reported variety of factors that determine the prognosis of DUP. These include advanced age, major and chronic medical conditions, peri-operative hypotension, and delay in diagnosis and management. The present study was conducted in a tertiary care teaching hospital with an aim to determine risk factors and prognostic determinants of DUP. **Methods:** Patients of > 18 years of age presenting with perforated chronic duodenal ulcers were included. The diagnosis of DUP was made by the treating surgeon and was based on clinical features. Radiological investigation supplemented clinical diagnosis whereas findings during surgery were used as confirmed diagnosis. **Results:** Advanced age, male gender, consumption of non-steroidal anti-inflammatory drugs (NSIDs), smoking tobacco and drinking alcohol were important risk factors for DUP. Surgical site infections were the commonest post-operative complications. The mortality rate was 9.8%. **Conclusion:** DUP is associated with high morbidity and mortality rates regardless of its cause. Smoking, alcohol consumption and use of NSAIDs are important risk factors for DUP. Surgical site infections are common post-operative complications. High morbidity and mortality rates underscore the importance of prompt diagnosis and appropriate surgical and medical interventions for better outcome.

KEYWORDS

Duodenal ulcer perforation, non-steroidal anti-inflammatory drugs, peptic ulcer

INTRODUCTION

Duodenal ulcer perforation (DUP) is one of the most common acute-abdominal emergencies in the field of general surgery. Patient with DUP often presents with acute abdomen and there is gastro-intestinal content spillage into the peritoneal cavity which results in condition like peritonitis, fluid and electrolyte imbalance, circulatory insufficiency and septicemia and ultimately death.[1]

The clinical manifestation of DPU is characteristically divided into three phases. In the initial phase occurs within 2 h of onset. It is featured by epi-gastric pain, tachycardia and cool extremities. The second phase occurs within 2 to 12 h. It present with generalized pain that worsens with movement and there is marked abdominal rigidity and right lower quadrant tenderness. The third phase appears after 12 h of onset. In this phase there is abdominal distension, pyrexia and hypotension with acute collapse circulatory system.[2]

DUP manifests mainly due imbalance between aggressive factors such as gastric acid and pepsin and mucosal defense barriers. The incidence of DUP is reported to be around 1.5% to 3% and nearly 4 million people are affected per annum across the globe.[3,4] It is associated with mortality rates (about 30%). However when DPU is diagnosed rapidly and treated promptly, outcomes are usually excellent with reduced mortality rates.[4]

Studies have reported variety of factors that determine the prognosis of DUP. These include advanced age, major and chronic medical conditions, peri-operative hypotension, and delay in diagnosis and management (>24 hours).[5-7]

The present study was conducted in a tertiary care teaching hospital with an aim to determine risk factors and prognostic determinants of duodenal ulcer perforation.

MATERIAL AND METHODS

The present descriptive cross-sectional study was performed for period of 2 years (January 2021-December 2022). Patients of > 18 years of age presenting with perforated chronic duodenal ulcers were included. The diagnosis of DUP was made by the treating surgeon and was based on clinical features. The clinical diagnosis was supported by radiological investigation whereas it was confirmed at surgery.

Surgery was defined as urgent if conducted < 4 h of admission, same day when conducted between 4- 24 h and delayed if conducted after 24 h of admission. Operative details included the site, size of perforation and nature of operation perforation performed. Mortality was defined as death following surgical procedure. Post operative morbidity of the patient was defined in terms of the duration of hospital stay and associated complications following surgery or non-surgical management. Data on patient co-morbid condition, presenting symptoms, vital signs, laboratory findings, and diagnostic procedures were recorded.

RESULTS

During the study period a total 112 cases of DUP were studied. 108 (96.4%) patients were males whereas 4 (3.6%) were females. The male:female ratio was 45:1.The age wise distribution of patients is shown in figure 1. Maximum patients (>50%) were from age group 41-60 years. The mean age of patient was 51.9±4.9 years.

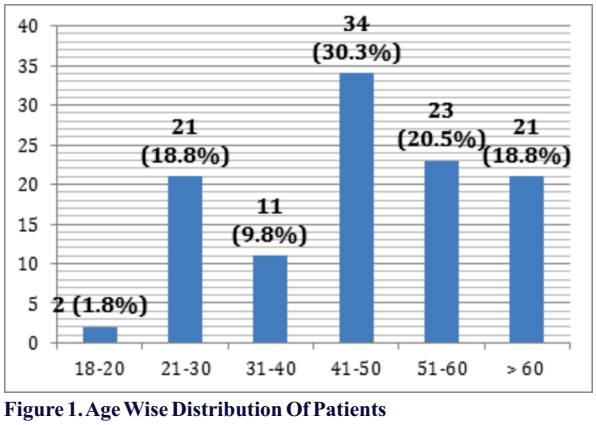

Figure 1. Age Wise Distribution Of Patients

A total of 58 (51.8%) cases belonged to lower socioeconomic group. On X-ray, a total of 91 (81.3%) patients showed air under diaphragm. A total 32 (28.6%) patients gave a history of intake of non-steroidal anti-inflammatory drugs (NSAIDs) prior to development of DUP. The average duration of symptoms was 2.38 days.

Out of 112 patients 47 (41.9%) had habit of smoking habit whereas 56

(50%) consumed alcohol whereas a total of 32 (28.6%) reported to have both habit of drinking alcohol and smoking tobacco. Smoking and alcohol consumption were reported in only patient.

The average time from patient reporting to emergency ward to surgery was 4.18 h. The mean length of stay in hospital was 8.9±1.4 days. The detail of post-operative complications is shown in Table 1. Surgical site infection (SSI) was the commonest post-operative complication. It was developed in 19 cases.

Complication	No. of patients (%)
Surgical site infections	19 (16.9)
Pneumonia	04 (3.6)
Septic shock	05 (4.5)
Paralytic ileus	07 (6.3)
Abdominal abscess	05 (4.5)
Pulmonary embolism	02 (1.8)
Wound dehiscence	06 (5.4)
Acute renal failure	03 (2.7)
Disseminated intravascular coagulation	03 (2.7)

A total of 11 patients succumbed to the disease due to development of septicaemia and cardiac arrest. Therefore the mortality rate in the present study was 9.8%.

DISCUSSION

Over the period of last two decades, incidence DUP is reported to be declined and as a result the need for elective ulcer surgery is also on declining.[8] However, neither the declined incidence nor need of surgical intervention for the correction of complications due ulcer like perforation, bleeding and obstruction have markedly changed during this period.

In this study, more than 50% of patients with DUP were from age group, 41-60 years whereas 18.8% were above 60 years. Similar findings were reported by other researchers. It is reported that patients belonging to these age groups are vulnerable to development of DUP had have vague and atypical clinical presentation.[9] It is also suggested that individuals belonging to these age group have high habit of consuming NSAIDs for various reasons including pain management, reduction of inflammation and for fever. Increased use NSAIDs increases the incidence of peptic ulcer perforation.[7,9]

A total of 34 (30.4%) cases were reported from age group 18-40 years. The development of DUP in this age group can be attributed to dietary factors and unhealthy life style including consumption of alcohol and tobacco smoking. These factors negatively affect the gastric acid secretion.

Smoking is well identified risk factor for DUP. In this study, a total of 47 (41.9%) patients had habit of smoking. The nicotine in tobacco is reported to inhibit secretion of pancreatic bicarbonate which leads to increased acidity in duodenum. It also alters the healing process of duodenal ulcers.[10,11]

DUP is reported to prevalent in alcoholics especially in patients having alcoholic liver diseases like cirrhosis. In this study, habit of alcohol consumption was reported by 50% of patients. Alcohol consumption deranges the gastric musoca and stimulates secretion of gastrin.[11] Chronic alcohol consumption and excessive production of gastric acid production like gastrinomas and Zollinger-Ellison syndrome (ZES) increases the incidence of DUP.[12-14] Pancreatic gastrin secreting tumor manifests ZES that stimulates the gastric parietal cells to increase the acidity, resulting in ulceration of gastro-intestinal mucosa.[11]

Out of 112 patients of DUP, a total of 58 (51.8%) cases belonged to lower socioeconomic group. Similar observation was noted in the study of Patil et al. (2015).[15] This may be due to high incidence of gastrointestinal infections like Helicobacter pylori in this group due to poverty, over-crowding and lack of hygiene.[16]

The classic sub-diaphragmatic air on x-ray was seen in 81.3% of patients. Radiological investigations are the mainstay of diagnosis. In DUP, x-ray findings characteristically show Rigler's sign, liver appears clear and air is seen under the diaphragm (football sign).[16]

In this study, SSI was the most common post-operative complication seen in DUP patients. Similar observation was noted by other researchers. High incidence of SSI may be due to contamination of the laparotomy wound during the surgical intervention.[17] (. In the present, the rate of mortality was 9.8%. It was mainly due to septicaemia and cardiac attack. Various researchers have reported mortality rates in DUP condition ranging from 1.3 to 20%.[18]

CONCLUSION

Duodenal ulcer perforation (DUP) is associated with high morbidity and mortality rates regardless of its cause. Smoking, alcohol consumption and use of NSAIDs are important risk factors for DUP. Surgical site infections are common post-operative complications. High morbidity and mortality rates underscore the importance of prompt diagnosis and appropriate surgical and medical interventions for better outcome.

Conflict of Interest: Nil

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