

AN OBSERVATIONAL STUDY OF CHANGING EPIDEMIOLOGICAL TRENDS IN INCIDENCE OF PEPTIC PERFORATION IN AGE GROUP 15-45 YEARS IN M. Y. HOSPITAL, INDORE

Devendra Chouhan¹, Rajkumar Mathur², Arvind Shukla³, Aarif Ansari[#]

¹*Resident, Department of Surgery, MGM Medical College and M. Y. Hospital, Indore, Madhya Pradesh.*

²*Professor and HOD, Department of Surgery, MGM Medical College and M. Y. Hospital, Indore, Madhya Pradesh.*

³*Assistant Professor, Department of Surgery, MGM Medical College and M. Y. Hospital, Indore, Madhya Pradesh.*

[#]*Assistant Professor, Department of Surgery, MGM Medical College and M. Y. Hospital, Indore, Madhya Pradesh.*

ABSTRACT

AIM

To investigate the recent change in epidemiology of benign peptic perforation in young adults.

METHODS

This is a prospective population-based single centre observational study of all patients diagnosed with benign perforated peptic ulcer; included were both gastric and duodenal ulcer patients admitted to Maharaja Yeshwantrao Hospital, Indore, between September 2013 and September 2015. Ulcers with a malignant neoplasia diagnosis verified by histology after biopsy, traumatic perforation, and perforation of age group >45 and <15 were excluded. Patient demographics, presentation patterns, and clinical data were retrieved from hospital records and surgical notes. Data collected by a working proforma in the form of a questionnaire having questions regarding their dietary habits, smoking, alcoholism, etc. from patients and their attendants both at the time of postoperative recovery in the wards.

RESULTS

In the study period, a total of 200 patients with PPU were identified; 169 were male patients and 31 were female patients. Maximum no. of patients were of age group 41-45 (61 cases, 30.5%), minimum below 20 years of age (7.5%). 164 patients (82%) were found to be non-vegetarian and 183 (91.5%) patients were having positive history of oily/spicy food. 106 (53%) patients were having positive history of smoking and 119 (59.5%) patients were having positive history of alcohol intake. History of NSAIDs abuse and drug abuse was not found to be significant. Duodenal to gastric perforation ratio found was 10:1. The overall mortality in our study is 14%. No significant difference in mortality was found between genders. However, for patients >40 years, the incidence increased over 4 times and mortality more than 12 times compared to younger age <20 years. After 1 month followup, out of 172 discharged patients, 145 (84%) patients came with symptoms resolved or having no complication. After 2 months followup, 158 (92%) patients came with symptoms resolved and 166 (96%) patients changed their dietary habits and lifestyle.

CONCLUSION

The incidence rate and mortality rate was stable. In our study, we found male preponderance, may be due to their lifestyle changes. Maximum number patients are found in age group 41-45 years. As in all previous studies, as age advances, incidence of peptic perforation also increases. Also, found strong relationship between consumption of oily or spicy food and non-vegetarian food with incidence of peptic perforation. Relation of peptic perforation with NSAIDs, smoking, and alcoholism follows same trends as in previous studies.

KEYWORDS

Perforated Peptic Ulcer, Epidemiology, Incidence, Mortality, Dietary Habits, Life style.

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INTRODUCTION: Acid peptic disease of stomach and duodenum represent one of the most common and widely spread disease in today's world which is full of anxiety, tension, and sedentary work. Peptic ulcer is common among adults in modern society. Each year, Peptic Ulcer

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Corresponding Author:

Dr. Devendra Chouhan,

#305-C, Gardenia, Milan Heights, Bicholi Mardana Road,

Indore, Madhya Pradesh, India.

E-mail: devendrachouhan87@gmail.com

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Disease (PUD) affects 4 million people around the world.⁽¹⁾

Complications are encountered in 10%-20% of these patients and 2%-14% of the ulcers perforate. Perforated Peptic Ulcer (PPU) is a quite rare, but life-threatening disease and the mortality varies from 10%-40%. The physical morbidity and economic incapacity associated with this disease justify continued interest in its epidemiology. Gastric mucus secreted by mucous cells of the gastric mucosa epithelium and gastric glands are important in mucosa defence and in preventing peptic ulceration. These two systems are in harmony. Any disturbance of these causes acid peptic disease. Ulcers are defined as breaks in

the mucosal surface >5 mm in size with depth to the submucosa.

It remains one of the most prevalent and costly GI disease. Admissions for complication of ulcer disease have also been decreasing, which has led to a significant decrease in ulcer-related mortality from 3.9% to 2.7% from 1993 to 2006. Although, overall mortality remains low. This still represents over 4000 deaths caused by peptic ulcer disease each year. The second most common ulcer related complication is perforation after gastrointestinal bleeding being reported in as many as 6-7% of PUD patients with an estimated 30-day mortality of over 20%. Peptic ulcers are caused by increased aggressive factors, decreased defensive factors, or both. This in turn leads to mucosal damage and subsequent ulceration, which further lead to peptic perforation. It is now widely accepted that infection with *H. pylori* and consumption of NSAIDs are most important factors in development of peptic ulcer, which leads to perforation. Cigarette smoking predisposes to peptic ulceration and increases the relapse rate after treatment.

But recently, cases of peptic perforation increased especially in young adults basically due to their changing lifestyle like spicy food intake, smoking, stress, etc. All these factors affect gastric mucosa and gastric acid secretion and also no signs of *H. pylori* infection or history of NSAIDs consumption found in them. In our study, 200 patients which are operated for peptic perforation of age group 15-45 years admitted to Maharaja Yeshwantrao Hospital are taken. In continuum, our study focuses on the epidemiology and causes of peptic perforation diseases in age group 15 to 45 years with special reference to dietary habits in patients having peptic perforation diseases in our region because especially in Malwa region very spicy food is consumed throughout the day from breakfast to dinner in the form of 'usal poha, kachori, samosa, etc.' in which main ingredients are oil, different type of spices, e.g. red capsicum powder, garam masala, etc. and all these factors affect gastric mucosa and gastric acid secretion, which lead to peptic ulcer disease and further complicate to peptic perforation. We have also focused on its relationship with smoking, alcoholism, NSAIDs abuse, and other factors, which cause peptic perforation. Here, we also investigate increasing incidence of peptic perforation in young adults even with no history of NSAIDs, no history of any fever or *H. pylori* infection, no history of smoking, but again incidence in these young patients is increasing very rapidly.

Our hospital is one of the 5 tertiary health institutions in the state. Hospital receives referrals for most elective and emergency surgical conditions from all over the state. This study demonstrates the changing epidemiological trends of peptic perforation diseases and its increased incidence in young patients in this part of India and highlights the need for changing dietary habits and avoiding other causative factors in these age group patients.

MATERIALS AND METHODS: Study population - All patients of age group 15-45 years diagnosed with benign peptic perforation admitted to M.Y. Hospital from September 2013 to September 2015 with followup for 2 months after discharge.

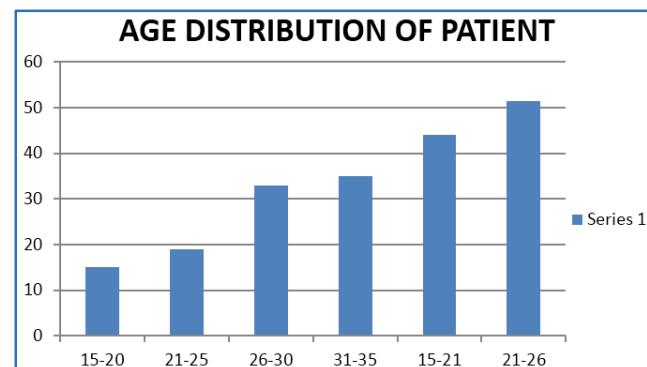
Inclusion Criteria: All patients of 15-45 years age group having peptic perforation.

Exclusion Criteria: Perforation with malignant neoplasia verified by histopathology report, age group >45 years, age group <15 years, and traumatic perforation.

Sample Size: 200 patients having peptic perforation.

| Age Group | No. of Patients | Percentage |
|-----------|-----------------|------------|
| 15-20 | 15 | 7.5 |
| 21-25 | 19 | 9.5 |
| 26-30 | 33 | 16.5 |
| 31-35 | 35 | 17.5 |
| 36-40 | 37 | 18.5 |
| 41-45 | 61 | 30.5 |

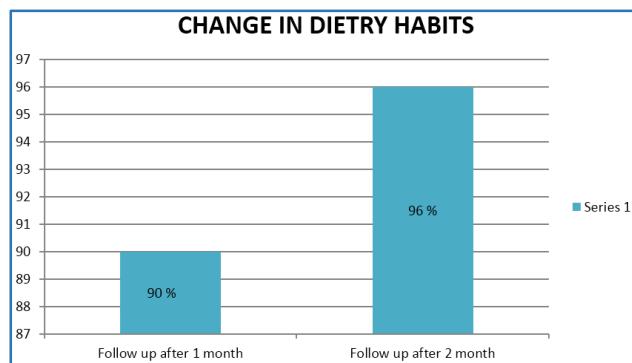
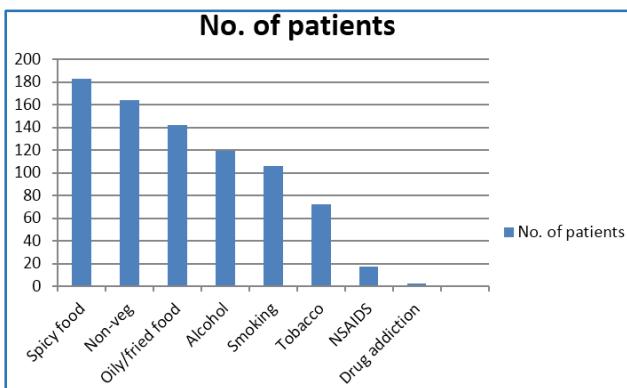
Table 1: Age Distribution of Patients



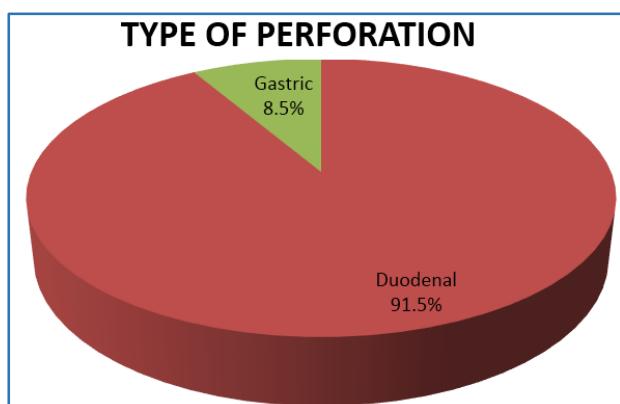
In our study, maximum number of patients were of age group 41-45 (61 cases, 30.5%). Least affected age group was below 20 years of age (7.5%).

| Risk Factors | No. of Patients | Percentage |
|-----------------|-----------------|------------|
| Spicy food | 183 | 91.5 |
| Non-veg | 164 | 82 |
| Oily/fried food | 142 | 71 |
| Alcohol | 119 | 59.5 |
| Smoking | 106 | 53 |
| Tobacco | 72 | 36 |
| NSAIDS | 17 | 8.5 |
| Drug Addiction | 02 | 1 |

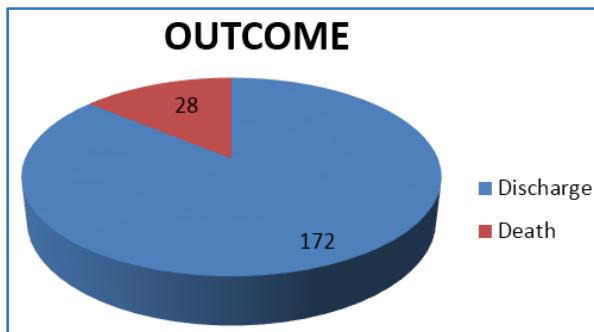
Table 2: Risk Factors Distribution



| Type of Perforation | No. of Patients | Percentage |
|---------------------|-----------------|------------|
| Duodenal | 183 | 91.5 |
| Gastric | 17 | 8.5 |

Table 3: Type of Perforation

| Outcome | No. of Patients | Percentage |
|-----------|-----------------|------------|
| Discharge | 172 | 86 |
| Death | 28 | 14 |

Table 4: Outcome

| Change in Dietary Habits | No. of Patients (Total No. of Discharge pt. 172) | Percentage |
|--------------------------|---|------------|
| Followup after 1 months | 155 | 90 |
| Followup after 2 months | 166 | 96 |

Table 5: Change in Dietary Habits on Followup

Total number of discharged patients is 172 out of 200. After 1 month followup, out of 172 discharged patients, 155 (90%) patients changed their dietary habits and changed their lifestyle. After 2 months followup, 166 (96%) patients changed their dietary habits and changed their life style, i.e. increase in 14 (6%) patients at 2nd followup.

DISCUSSION: In our study, we found male preponderance. Out of 200 patients, 164 (84.5%) patients are male and rest 36 (15.5%) are female patients. This is due to more change in dietary habits of male and also associated with their smoking and alcohol intake habits. A study conducted in 2010 in Norway on Epidemiology of Perforated Peptic Ulcer: Age and gender adjusted analysis by Kenneth Thorsen et al., there was an almost equal gender distribution (52% were women), but women were significantly older than men (median age of 73 years vs. 62 years respectively).⁽²⁾ The number of women affected increased significantly with age across age groups with only one in four patients aged <50 years of age being female compared to two-thirds of those >70 years of age being female (26% vs. 65% women respectively).

Another study in India on topic - Prevalence of peptic ulcer in India: An endoscopic and epidemiological study in urban Kashmir by M.S. Khuroo et al., found that in a randomly selected sample of 2763 persons of age more than 15 years and above was surveyed.⁽³⁾ These included 1742 (63%) men and 1021 (37%) women. In our study, we found that there was maximum number of patients of age group 41-45 years, 61 patients (30.5%) and least affected age group was patients of 15-20 years, 15 patients (7.5%). Kenneth Thorsen et al. studied about age and comorbidity. He observed that of those aged >60 years of age, 105 of 117 (90%) had comorbidity compared to 37 of 55 (67%) of those aged ≤60 years. Another study by M.S. Khuroo in India suggested that the prevalence of peptic ulcer increased with age with a steep rise in the fourth decade and a peak lifetime prevalence of 28.8% in the fifth decade of life, he found maximum number of patients of age group 41-50 years (26.9%).

Another study on epidemiological study of peptic ulcer in the south of India by S.L. Malhotra et al. observed that the peak age for gastric ulcer in men was 31-40 years and for duodenal ulcer 21-50 years; in women, the peak age was 21-30 years for both gastric and duodenal ulcers after which the incidence dropped to rise again between 41 and

50 years.⁽⁴⁾ In our study, 164 (82%) are non-vegetarian and 36 are vegetarian (18%); 183 (91.5%) patients having positive history of oily/spicy food and 17 (8.5%) patients having no history of oily/spicy food. Diet has also been thought to play a role in peptic diseases. Certain foods and beverages can cause dyspepsia.

Non-vegetarian food itself is not an important aetiological factor, but the way it is cooked is. It is cooked with lot of spices and oil, which are more ulcerative in nature. The cooking varies from person to person, but one thing common in most of the non-veg food is that it requires a large portion of oil and large amounts of different type of spices.

All roasted, grilled, and deep fried non-veg food are found to be more dangerous because these foods cause acidity. Consuming fried food can increase production of stomach acids and inflame stomach ulcer. Also, these grilled and deep fried foods produce nitrous oxide (NO), which inhibit the synthesis of prostaglandins in stomach, which eventually lead to ulcer formation. S.L. Malhotra et al. studied on aetiology of peptic ulcer and suggest that ulcers have been ascribed in various parts of the world to hot foods, spices, fasting, overeating, excessive starch, alcohol, coffee and tea, and to smoking. Somervell and Orr (1936) and Hadley (1959) believed that hot foods, tapioca, chillies, and condiments contributed to the high incidence in the south of India.⁽⁵⁾

It is probable that saliva by virtue of its blood group substances or some other unrecognised factors, which when adequately supplied to the stomach and duodenum protect these organs from ulceration. Bolted and hurried meals may produce minor trauma in the mucosa, but if adequate salivary secretions are present in the food due to the capacity of saliva to accelerate coagulation, these minor injuries will heal or perhaps as has been suggested. Pulvertaft (1959) has observed that ulcer in his series was more common in populations, which consumed more sweets and sugar.⁽⁶⁾ In our study, out of 200 patients, 183 (91.5%) patients presented with duodenal perforation and 17 (8.5%) patients presented with gastric perforation. In a study by Thorsen K et al. (2013), gastric perforation predominated and accounted for 112 of 172 (65%) patients in his study, but declined during the latter years of the period while the frequency of duodenal ulcers remained stable.⁽⁷⁾ As per M.S. Khuroo et al, duodenal ulcer to gastric ulcer ratio was 171:1.⁽⁴⁾

Duodenal ulcer was twice as common in men compared with women and benign gastric ulcer was four times more common in men than women. (Lancet, 1959).⁽⁸⁾ Doll et al. (1951) found that the gastric to duodenal ulcer ratio rises progressively from 1:3 to about 1:1 as age increases and as the level of the social class decreases.⁽⁹⁾ Dogra (1940) found the gastric ulcer:⁽¹⁰⁾ duodenal ulcer ratio was 1:30 whereas in Hadley's (1959) series the ratio was 1:13 and in a series by S.L. Malhotra (1967)⁽⁴⁾ gastric ulcer/duodenal ulcer ratio was 1:6. Taking into account only the surgically confirmed cases, the

duodenal perforation/gastric perforation ratio in our study is 10:1.

RESULTS AND CONCLUSION: In our study, we found increase in incidence of peptic perforation in young people because of life style changes even though they were not taking NSAIDs. They smoke, drink, consume spicy food throughout the day, and are stressed. All these factors act together, cause peptic ulcer disease, which eventually leads to peptic perforation. We found male preponderance, may be due to their lifestyle changes. Maximum number of patients are found in age group 41-45 years as in all previous studies; as age advances incidence of peptic perforation also increases. We also found many cases of peptic perforation in age group <20 years. These young adults are increasing in number, and we found more cases of peptic perforation in them because of their changing lifestyle.

Maximum young patients in our study was either hosteller or they reside away from their home. These young people have poor parental inhibition. They very often smoke, drink alcohol, eat outside spicy food, and many of them were also drug abusers. In our study, we found strong relationship between consumption of oily or spicy food and non-vegetarian food with incidence of peptic perforation, and especially in Malwa region of Madhya Pradesh these habits are more prevalent.

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