

## ORIGINAL ARTICLE

AETIOLOGICAL FACTORS OF NON-TRAUMATIC  
DUODENAL PERFORATION

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**Background:** Each year peptic ulcer disease affects 4 million people around the world. Perforation of the duodenum due to peptic ulcer remains a considerable medical problem causing high morbidity and mortality. This study aimed to determine the major aetiological factors of non-traumatic duodenal perforations. **Methods:** It was a cross-sectional study carried out in Surgical 'B' Unit, Ayub Teaching Hospital, Abbottabad, Pakistan from 15<sup>th</sup> Jun 2012 to 15<sup>th</sup> May 2015. One hundred and eighty-six patients were recruited for the study. Data was collected and analysed on SPSS-23. **Results:** Mean age of the study participants was 48.4±7.14 years. Male to female ratio was 3:5. The main causative agent was *H. pylori* (54.30%), 22.04% were smokers, 6.99% had history of using NSAIDS, and 31 (16.67%) patients had more than one causative factor. There was strong association found between age groups and socio-economic status ( $p=0.004$ ), and literacy level of the respondents ( $p=0.003$ ). **Conclusion:** Non-perforated ulcers are significantly associated with middle-aged people, low socioeconomic status, NSAIDS, smoking, and *H. pylori*.

**Keywords:** Duodenal perforation, *H. pylori*, NSAIDS, Ulcer, Bleeding

Pak J Physiol 2017;13(1):19–21.

## INTRODUCTION

Each year peptic ulcer disease affects 4 million people around the world.<sup>1</sup> Despite new efficient drugs to treat peptic ulcer, and increasing knowledge about its aetiology, the incidence of peptic ulcer complications, i.e., bleeding, perforation, and obstruction have been reported by several workers to be unchanged in the range of 10–20%.<sup>2,3</sup> Non-traumatic duodenal perforation is a serious complication of peptic ulcer disease with high morbidity and mortality occurring in approximately 2–14% of peptic ulcers.<sup>4,5</sup> The mortality rate of perforated ulcers can be as high as 23–30%<sup>5,6</sup>, particularly if the patient population has a large proportion of elderly the morbidity has been reported as 30–50%.<sup>5,7,8</sup> Perforation of ulcers in children is rare. Main aetiological factors include: *Helicobacter pylori* 80%,<sup>9</sup> use of non-steroidal anti-inflammatory drugs (NSAIDs) 2–4%,<sup>10</sup> and smoking 64%,<sup>11</sup> mainly associated with initiation, delayed healing, relapses, and complications of peptic ulcer disease. Other associated aetiological factors include steroids use, alcoholism, stress, and a diet high in salt.<sup>6,12</sup>

Duodenal perforation is a cause of obscure peritonitis heralded by exacerbation of abdominal pain associated with rigidity, guarding, tenderness and rebound tenderness, silent abdomen, and free gas in the peritoneal cavity. Immediate surgery is the treatment of choice in most patients with suspected perforated peptic ulcer.<sup>3</sup> Emergency laparotomy is usually performed.<sup>2</sup> Non-operative treatment of perforated duodenal ulcer can be considered only in poor operative candidates in whom the perforation has been present for more than 24 hours, the pain is well localized, and there is no evidence of ongoing extravasations.

Perforation of the duodenum due to peptic ulcer remains a considerable medical problem causing high morbidity and mortality. The epidemiology of duodenal ulcer and its perforation in Pakistan is difficult to describe due to lack of disease registry system. There is a trend of self-medication with poor compliance and patients do not seek medical advice. The high incidence of *H. pylori* infection, increasing use of NSAIDs, and smoking leading to non-traumatic duodenal perforation is a serious health issue. Keeping in view the high morbidity and mortality associated with duodenal perforation due to failure of anti-ulcer drugs or non-compliance of patients or any concomitant factor or disease that predisposes to perforation, estimates of the disease need to be available in our setting. This study intends to determine major aetiological factors and frequencies of duodenal perforation.

## SUBJECTS AND METHODS

This cross-sectional study was carried out in the Surgical-B Unit, Ayub Teaching Hospital, Abbottabad, Pakistan from 15<sup>th</sup> June 2012 to 15<sup>th</sup> May 2015. Consecutive non-probability sampling technique was used. The study was conducted after approval from Hospital Ethical and Research Committee.

All patients admitted to Surgery B Unit, Ayub Teaching Hospital, Abbottabad and diagnosed as case of non-traumatic duodenal perforation having age between 20 and 60 years, both genders, and those having no recent history of abdominal trauma were included. All patients with history of recent abdominal trauma, age less than 20 years and more than 60 years and those who were diagnosed as case other than non-traumatic duodenal perforation were excluded from study.

The purpose and benefits of study was explained to the patients and an informed consent was obtained. Patients were subjected to detailed history and clinical examination. Blood samples for complete blood picture, serum electrolytes and serum enzyme-linked immunosorbent assay (ELISA) test to confirm *H. pylori* infection were taken on the same day. Erect Abdominal X-ray films were also taken. Operative findings on laparotomy were recorded. Any pus, free fluid were sent for culture and sensitivity and margins of the perforation and lymph node if found sent for histopathology.

Data were analysed using SPSS-23. Continuous variables like age were described as Mean±SD. Categorical variables like gender, socioeconomic status, smoking, NSAID use and *H. Pylori* infection were expressed as frequencies and percentages. Chi-square test was used and  $p \leq 0.05$  was taken as significant.

**RESULTS**

The demographic data of the subjects is tabulated in Table-1. Total subjects included in the study were 186. Among them 145 (77.95%) were males and 41 (22.05%) were female. Mean age of the study participants was 48.4±7.14 years with a median of 35 years and a mode of 39.12 years. The age ranged from 20–60 years. Regarding educational status most of patients, i.e., 84 (45.16%) were illiterate, 41 (22.04%) had primary, 39 (20.97%) middle, 17 (9.15%) SSC, and 5 (2.68%) had above SSC level of education. There was a strong association between age groups and literacy level ( $p=0.003$ ).

**Table-1: Demographic data of the subjects**

Gender	Number	Percentage
Male	145	77.95
Female	41	22.05
<b>Age</b>		
20–35	47	25.27
35–50	87	46.77
50–60	52	27.96
<b>Education</b>		
Illiterate	84	45.16
Primary (5 years)	41	22.04
Middle (8 years)	39	20.97
Matric/SSC (10 years)	17	9.14
Above SSC	5	2.69

Out of total subjects 113 (60.7%) were unemployed, 63 (33.8%) employed, and 10 (5.3%) didn't respond to this question. One hundred and nineteen (63.9%) of the subjects were from rural while 67 (36.02%) were from urban areas.

Regarding socioeconomic status 115 (61.83%) of the patients belonged to poor families, 56 (30.11%) to middle class, and only 15 (8.06%) fell in high class. There was a strong association between age groups and socioeconomic status ( $p=0.004$ )

The main causative agent was *H. pylori*, i.e., 54.30% individuals were affected from it. Smokers were 22.04%, and 6.99% had history of using NSAIDS for arthritis mainly or for some other cause for more than 2 years. Thirty-one (16.67%) patients had more than one causative factors. (Table-2).

**Table-2: Major aetiological factors for duodenal perforation**

Causes	Number	Percentage
<i>H. Pylori</i>	101	54.3
Smoking	41	22.04
Multiple Factors	31	16.67
NSAIDs	13	6.99

**DISCUSSION**

It was found in this study that majority of the perforations occurred in middle age with mean age of the study participants was 48.4±7.14 years while 77.95% of the subjects suffering from it were males. Similar to our study the higher proportion of male were reported in other studies<sup>11,13,14</sup>. A study conducted by Machado NO, mean age of these patients was 58.5 years with nearly two third (62.9%) being female patients.<sup>6</sup> Higher percentage of females was also reported in another study<sup>10</sup>.

A significant correlation ( $p=0.001$ ) between age and prevalence of duodenal perforation was found in our study. There was strong association was found between age groups and socio-economic status ( $p=0.004$ ) and literacy level of the respondents ( $p=0.003$ ). Persons with lower socio-economic status and lower educational status were found to be more having these ailments than the rest groups. It was found that 61.83% of the patients belonging from poor family, 30.11% from middle class and only 8.06% belonging to high class. Low socio-economic people suffering from duodenal perforation were also reported in other studies<sup>11,15</sup>.

In this study 46.77% of the participants were of middle age, while in young and elderly the percentage were low. Similar findings were also reported by Karbhari<sup>16</sup>.

In the current study it was found that the main causative agent (54.30%) was *H. pylori*, 22.04% were smokers, 6.99% having history of using NSAIDS for more than 2 years, and 16.67% of the individuals had more than one causative factors. In the study of Dakubo, *et al*<sup>15</sup> 47.7% patients were using NSAIDS which is almost three times more than our study; 11.4% of their patients were smokers which are lower than our study. Malik *et al*<sup>17</sup> reported 47.6% of subjects using NSAIDS and 26% being smokers. This is higher than our study. Similar higher percentage of NSAIDS followed by smoking were found in other studies.<sup>13,18</sup> The study of Zelickson MS *et al*<sup>1</sup> showed 26% association between perforated duodenal ulcer and *H. pylori* which is half to

our findings. In Haider's<sup>10</sup> study the association with *H. pylori* was 80% which is almost twice to our study.

## CONCLUSION

Non-traumatic duodenal perforation is highly prevalent in middle age people particularly in rural areas of Pakistan and is a hidden burden of disease in lower socio-economic people. Males are more prone to be suffering from this. Middle aged people are more prone to duodenal perforation.

## RECOMMENDATION

Early recognition and prompt treatment is required in case of duodenal perforation. Patients should also be addressed regarding risk factors for development of duodenal ulcers and its complication.

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Received: 15 Jan 2017

Reviewed: 25 Feb 2017

Accepted: 17 Mar 2017