ORIGINAL RESEARCH

To asses smoking alcoholism and NSAIDS intake as a independent risk factor for peptic ulcer perforation

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ABSTRACT

Aim: To asses smoking alcoholism and NSAIDS intake as a independent risk factor for peptic ulcer perforation. **Material and methods:** An analytical investigation was undertaken at B.R.D Medical College, Gorakhpur to asses smoking alcoholism and NSAIDS intake as a independent risk factor for peptic ulcer perforation. Based on the findings, ethical clearance was recommended. In this investigation, the patients were categorised into two categories. This research comprised patients from group 1 who had perforation peritonitis caused by peptic ulcer perforation. The patients included in group 2 had an endoscopic diagnosis of peptic ulcer disease. **Results:** In this study , people of more than 15 were taken in to study, in which 41 - 50 year age people were more common followed by >60 years. In this study Male were mostly affected as compared to Female, mostly patient were Male. In this study smoking and alcohol have been found to be a major risk factor for perforation, where smoking is found to be 63.33% and alcohol 50%. In this study , patient with History of NSAIDS intake for unspecified pain or chronic illness was 56.67%. Most common site of perforation is the distal part of the stomach, in this study pre pyloric site was more common (86.67%) as compared to pyloric part (13.33%). **Conclusion:** Perforated peptic ulcer is often seen in individuals within the age range of 41-50 years. The delayed onset of the illness is associated with patients who come from distant regions without adequate healthcare facilities and health education. Consequently, these patients often arrive to the hospital at an advanced stage of the condition.

Keywords: Smoking, Alcoholism, NSAIDS, Peptic ulcer perforation,

INTRODUCTION

Peptic ulcer disease (PUD) arises due to an imbalance between the stomach acid-pepsin and the protective barriers of the mucosa.[1] Annually, it impacts a total of 4 million individuals globally. The prevalence of PUD has been estimated to range from 1.5% to 3%. While 10%-20% of individuals with PUD may encounter difficulties, only 2%-14% of the ulcers may perforate, leading to the development of an acute disease.[2] Perforation is a significant and potentially life-threatening consequence of peptic ulcer disease (PUD). Patients with a perforated peptic ulcer (PPU) are at a heightened risk for both illness and death.[3] The overall occurrence rate of perforation in patients with peptic ulcer disease (PUD) is around 5%. The treatment involves the administration of proton pump inhibitors and the implementation of eradication therapy for Helicobacter pylori. Despite all these factors, the rates of peptic ulcer perforation have remained constant, indicating that it continues to be a significant health concern. In the poor world, the majority of patients are often young males who smoke. In contrast, in industrialised nations, patients tend to be older individuals with many pre-existing medical conditions and a history of using non-steroidal anti-inflammatory medicines (NSAIDs) or steroids.[4]

Topical effects of NSAIDs are likely the major mechanism responsible for the acute hemorrhages and erosions observed acutely after NSAID challenge. Within a few minutes of NSAID ingestion, denudation of surface epithelial cells and increased mucosal permeability occur. Most NSAIDs are weak organic acids that, in acidic gastric juice, are unionized and thus freely lipid soluble. The lipid-soluble, un-ionized.[5] NSAIDs diffuse across gastric mucosal epithelial cell membranes into the cytoplasm, where they ionize at neutral pH and thus become “trapped” within the cells. The high intracellular concentrations of NSAIDs cause local toxic effects.

One mechanism of these local effects is an uncoupling of oxidative phosphorylation, resulting in decreased mitochondrial energy production, a reduction in cellular integrity and increases in cellular permeability. Another topical mechanism of NSAID injury is an attenuation of the phospholipid content and surface hydrophobicity of the gastric mucus gel layer. Some NSAID metabolites that are excreted in bile can also cause topical injury to the gastrointestinal mucosa. The most important risk factor for an NSAID-induced complication is a history of prior peptic ulcer disease or a prior ulcer complication factors that increase the risk for NSAID-induced GI events by twofold to fourfold. Advanced age is also a substantial risk factor. Although there also appears to be a threshold age at which risk dramatically increases, the relative risk increases linearly at the rate of approximately 4% per year of advanced age. Data on the role that duration of NSAID exposure has in the risk for GI events have been conflicting. Some case-control studies have suggested that the risk of NSAID- associated gastrointestinal complications is highest within the first 30 days of NSAID use.[6,7] It has become clear from epidemiologic studies that as the dose of an NSAID increases, the risk of ulcer complications also increases in parallel fashion. Other risk factors are concomitant use of glucocorticoids or anticoagulants and comorbid conditions such as significant heart disease or rheumatoid arthritis. NSAID use and H.pylori infection generally have been regarded as independent risk factors for peptic ulcer disease8. However, evidence is accumulating that H.Pylori infection and NSAID use may be more than just additional risk factors for ulcer disease. NSAID users infected with H.pylori have an almost twofold increased risk for developing bleeding peptic ulcers compared to that with uninfected NSAID users and low dose aspirin causes more gastric injury in H.pylori infected subjects than uninfected individuals.[8]

The Non steroidal anti inflammatory drugs has been implicated as a treatment modality for patients of rheumatoid arthritis and osteoarthritis, which is considered as one of the important etiology for peptic ulcer and subsequently lead on to perforation. The incidence of NSAID induced perforation is more in gastric region than duodenum and the prevalence is around ten to 15% The cause of APD is increased thrice in patients who on NSAIDS than control whereas risk increases 5 fold in old aged patients of 60 years and above as the intake of drugs is more for pain and osteoarthritis. Consumption of steroidal anti inflammatory drugs have increased the incidence of perforation 6- 8 times and contribute towards a quarter of perforation patients. Recent research has confirmed the association of NSAIDs as a cause of peptic ulcer disease, the reduction in the gastrointestinal side effect of NSAIDS can be controlled by limiting the intake of ulcerogenic drugs, counselling and prescription of anti ulcer medications (proton pump inhibitors and the use of H2 blockers), prostaglandins, and antisecretory medicines), and prescription of NSAIDs with minimal gastrointestinal side effects to patients at risk of developing gastrointestinal complications A recent study of lumiracoxib 15 showed a three to four fold(79 %) reduction in ulcer complications compared with other NSAIDs in the treatment of patients with osteoarthritis.[9] But selective NSAIDs cost significantly more than nonselective agents. In the long term, refinement of NSAIDs and improved treatment protocols should further reduce the incidence of peptic ulcer disease and its complications. There is now more uniform agreement in recent reports concerning the incidence of nonsteroidal antiinflammatory drugs (NSAIDs) used by patients presenting with perforated ulcers;These vary from of 32% to 60% in those patients with perforated ulcer in whom NSAID usage was implicated as a major factor. So NSAIDS are accepted as iatrogenic cause of the peptic ulcer disease and for future perforation.[10]

MATERIAL AND METHODS

An analytical investigation was undertaken at B.R.D Medical College, Gorakhpur to asses smoking alcoholism and NSAIDS intake as a independent risk factor for peptic ulcer perforation. Based on the findings, ethical clearance was recommended. In this investigation, the patients were categorised into two categories. This research comprised patients from group 1 who had perforation peritonitis caused by peptic ulcer perforation. The patients included in group 2 had an endoscopic diagnosis of peptic ulcer disease.

METHODOLOGY

The patient was segregated into two cohorts. Group 1 consists of patients aged 15 years and above who have had surgery for perforated gastric and peptic ulcers. Group 2 consists of individuals who are above 18 years old and have been diagnosed with peptic ulcer disorders by endoscopy. In group 1, two mucosal biopsies were obtained from the perforated site. One biopsy was collected in normal saline for culture, while the other was placed in formalin solution for pathological investigation. In group 2, after endoscopic identification of peptic ulcer disorders, a mucosal biopsy was obtained from the antrum and submitted for microbiological analysis to perform the Rapid Urease Test. The biopsies from both groups will undergo histological evaluation to determine the presence of H.pylori. If the aforesaid test yields positive results, patients was classified as h.pylori positive.

RESULTS

In this study , people of more than 15 were taken in to study, in which 41 - 50 year age people were more common followed by >60 years.

Table 1: Distribution of peptic ulcer patients' according to different age group

Age (years)	Number (n)	Percentage (%)
21-30 years	4	13.33
31-40 years	6	20.00
41-50 years	10	33.33
51-60 years	2	6.67
>60 years	8	26.67
Total	30	100

In this study Male were mostly affected as compared to Female, mostly patient were Male

Table 2: Distribution of study population according to gender

Gender	Number (n)	Percentage (%)
Male	29	96.67
Female	1	3.33

In this study smoking and alcohol have been found to be a major risk factor for perforation , where smoking is found to be 63.33% and alcohol 50%.

Table 3: Smoking and alcohol status of study population

		Number (n)	Percentage (%)
Smoking	Present	19	63.33
	Absent	11	36.67
Alcohol	Present	15	50.00
	Absent	15	50.00

In this study, patient with History of NSAIDS intake for unspecified pain or chronic illness was 56.67%.

Table 4: Distribution of study population according to non steroidal anti-inflammatory drugs (NSAIDs)

NSAIDs	Number (n)	Percentage (%)
Present	**17**	56.67
Absent	**13**	43.33

Most common site of perforation is the distal part of the stomach , in this study pre pyloric site was more common (86.67%) as compared to pyloric part (13.33%).

Table 5: Distribution of study population according to Site of perforation

Site of perforation	Number (n)	Percentage (%)
Prepyloric	**26**	86.67
Pyloric	**4**	13.33

In this study , two tests were used to detect the presence of H.Pylori ,IgG ELISA and Rapid urease test , considering IgG ELISA more specific , out of 30 cases 17 were positive for H.Pylori IgG ELISA (56.67%) and Rapid urease test out of 30 cases 21 were positive (70.00%).

Table 6: Distribution of study population according to Rapid Urease Test and IgG test

H. pylori		Number (n)	Percentage (%)
Rapid Urease Test	Positive	**21**	70.00
	negative	**9**	30.00
IgG	Positive	**17**	56.67
	negative	**13**	43.33

Out of 30 patients operated for Peptic ulcer perforation in this study ,On histopathological examination were found to be non specific chronic inflammatory lesions .

Table 7: Distribution of study population according to histopathology

NSCIL	Number (n)	Percentage (%)
Yes	**30**	100
No	**0**	0

Table 8: Comparisons of Smoking, Alcohol and NSAIDs in between Prepyloric and Pyloric

		Prepyloric (n=26)		Pyloric (n=4)	
		n	**%**	**n**	**%**
Smoking	**Present**	**16**	64.00	3	75.00
	Absent	**10**	40.00	1	25.00
Alcohol	**Present**	**13**	52.00	2	50.00
	Absent	**13**	52.00	2	50.00
NSAIDs	**Present**	**15**	60.00	2	50.00
	Absent	**11**	44.00	2	50.00

Table 9: Comparisons of Rapid Urease Test and IgG test in between Prepyloric and Pyloric

H. pylori		Prepyloric (n=25)		Pyloric (n=4)	
		n	**%**	**n**	**%**
Rapid Urease Test	Positive	**17**	68.00	4	100.00
	negative	**9**	36.00	0	0.00
IgG	Positive	**14**	56.00	3	75.00
	negative	**12**	48.00	1	25.00

DISCUSSION

Cigarette smoking has been mainly implicated and a strong independent risk factor in the pathogenesis of peptic ulcer disease and its complications.[11] The complications implicated in cigarette smoking are due to Decreases healing, Impairs response to healing Increases complications as perforation. Smokers have a three fold higher mortality from peptic ulcer than nonsmokers. The proposed mechanism in smokers is that smoking causes reduction in the blood supply to gastric mucosa due to vasoconstriction, leading on to ischemia and that ischaemia reduces mucosal resistance against, for instance, the action of acid and ulcerogenic contribute to ulcer perforation. Tobacco smoking is a well known risk factor for uncomplicated peptic ulcer. the risk of peptic ulcer progressively increased with increasing pack years cigarettes. Silverstein[12] documented effects of the toxic constituents of cigarette smoke particularly nicotine, carbon monoxide, and hydrogen cyanide and suggested potential mechanisms by which smoking may undermine expeditious wound repair. Nicotine is a vasoconstrictor that reduces nutritional blood flow to the skin, resulting in tissue ischemia and impaired healing of injured tissue. Nicotine also increases platelet adhesiveness, raising the risk of thrombotic microvascular occlusion and tissue ischemia. In addition, proliferation of red blood cells, fibroblasts, and macrophages is reduced by nicotine. Carbon monoxide diminishes oxygen transport and metabolism, whereas hydrogen cyanide inhibits the enzyme systems necessary for oxidative metabolism and oxygen transport at the cellular level. This could also explain the toxic effects of cigarette smoking leading to perforation of gastroduodenal ulcer.

Alcohol contributes an important risk factor and independent risk factor for duodenal perforation. The current alcohol drinkers were at least three times increased risk of perforation as compared to nonalcoholics. Alcohol is known to impair wound healing through a variety of mechanisms: nutritional deficiencies leading to impaired wound healing and alcoholic disinhibition leads to increased risk behavior and more prone for duodenal perforation than non drinkers Chronic alcoholism is also associated with the presence of gastric metaplasia. both clinically and experimentally, alcohol had been shown to affect the mucosal barrier and histology and altering gastric mucosal defense Mechanisms. These Ulcerogenic Effects Play A Crucial Role in the study of perforations done in other parts of the world.

In this study, a total of 60 patients (30 patients of perforated peptic ulcer , 30 patients of non perforated peptic ulcer) were taken. In this study , patients of age group more than 15 years were taken which were operated for peptic ulcer perforation and patients of age group more than 18 years were taken who presented with complaints of gastritis / dyspepsia. In this study , the most common affected age group was found to be 41 - 50 years, which is similar to the study conducted by Dogra et al [13] and John et al.[14] In a study conducted by Ugochukwu et al[15], the peak incidence was found to be 31-40 years. In this study, Males were commonly affected as compared to Females. The study conducted by Ng et al[16], Dogra et al [13], Aman et al [17], Ugochukwu et al [15] yielded similar results where incidence was more common in male as compared to Females. In this study , Smoking and Alcohol have been found to be independent major risk factors for Perforated peptic ulcer , where smoking is found to be associated with 63.33% of the study population and alcohol associated with 50% of the study population. This is similar to a study by Thirupathaiah et al [18] , Ugochukwu et al [15], which showed similar results i.e. smoking and alcohol have significant association with perforated peptic ulcer. In this study , NSAIDS in take for unspecified pain or chronic illness was found to be associated with 56.67% of patients operated for perforated peptic ulcers , this is similar to the study of Gisbert et al[19], which showed NSAIDS intakes was more frequent in

patients with perforated peptic ulcer (56%) than in those without perforation (26%).

Another study by Armstrong et al[20], the prevalence of NSAIDS use in perforated peptic ulcer patients was 60% as compared to only 9.9% in the hospital control group. In similar studies conducted by Borody et al[21], Nensey et al[22] , McColl et al [23] it was shown in absence of any H.pylori infection the most common cause of perforation was increased NSAIDS use .

CONCLUSION

Perforated peptic ulcer is often seen in individuals within the age range of 41-50 years. The delayed onset of the illness is associated with patients who come from distant regions without adequate healthcare facilities and health education. Consequently, these patients often arrive to the hospital at an advanced stage of the condition. We recommend doing further studies on the relationship between self-medication with over-the-counter pharmaceuticals and health difficulties, as well as raising awareness about the risks associated with this practice. Additionally, efforts should be made to address unhealthy habits such as smoking and promote healthier behaviours within society.

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