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Research Article

A Study on Definitive Role of Smoking Over Alcohol on Peptic Ulcer Disease.

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Abstract: Peptic ulcer disease is characterized by erosive lesions of the lining of the gastrointestinal tract, the mucosa being damaged by the action of Hydrochloric acid and Pepsin, spread deeply into the submucosa and lamina propria, mainly of the stomach and duodenum. Smoking, directly and indirectly, affects the lining of the stomach and duodenum, increases the duodenal gastric reflux with mucosal damage, decreases prostaglandin secretion, and slow and consistent exposure radically affects the prognosis allied with detained healing. Furthermore, the effects of smoking are related to long-term exposure, accelerating chronic ulcers with slow healing. This study focuses on a defined number of patients and tries to fulfill the lack of significance of smoking in other studies previously established. It stands out from other studies because most of the studies conducted give the general impression that alcohol consumption is more associated with peptic ulcers; this study is aimed to investigate as well as compare the role of smoking and alcohol, and the novelty of this study is intended to confirm the strong and indispensable capacity of smoking in the causation and complications of peptic ulcer disease, focusing on patients who are already known and newly diagnosed, to elaborate our investigation on how despite treatment, smoking proves to be a significant cause delaying healing and affecting prognosis. The study group of hundred patients first and foremost revealed that only 50% to 60% were aware of their peptic ulcer disease, accounting for about fifty-three patients. And 92% of the patient's presented with hematemesis, coexisting with heartburn, regurgitation, Abdominal pain, or epigastric pain. This retrospective study of 100 patients distinctly revealed that the patients suffering from peptic ulcer disease had a compelling etiological factor as smoking, while alcohol was only an aggravating cofactor.

Keywords: Gastrointestinal ulcer, Gastric ulcer, duodenal ulcer, smoking, alcohol, gastric carcinoma, cigarette smoking, ulcerative lesion, retrospective study

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1. INTRODUCTION

Peptic ulcer disease is characterized by erosive lesions of the lining of the gastrointestinal tract,[1] the mucosa being damaged by the action of Hydrochloric acid and Pepsin.[2] Its effects can further spread deeply into the submucosa and lamina propria, mainly of the stomach and duodenum, rarely the esophagus.[3] Infection with Helicobacter pylori accounts for about 90% of peptic ulcer disease.[4] Alcohol consumption, smoking, stress, and certain drug usage can be accounted for as the leading detrimental causes of destruction of the mucosal layer. Recent studies on the general population focus remarkably on the alcohol-ulcer relationship and constantly place smoking only as a risk factor. [5] This study focuses on a defined number of patients and tries to fulfill the lack of significance of smoking in other studies previously established. This study stands out from other studies because most of the studies conducted gave the general impression that alcohol consumption is more associated with peptic ulcers; this study is aimed to investigate as well as compare the role of smoking and alcohol, and the novelty of this study is intended to confirm the strong and indispensable capacity of smoking in the causation and complications of peptic ulcer disease, focusing on patients who are already known and newly diagnosed, to elaborate our investigation on how despite treatment, smoking proves to be a significant cause delaying healing and affecting prognosis. It helps to focus on smoking as a stronger etiological factor providing firm evidence which impacts patient treatment and healing.

1.1. Background

Several cases of peptic ulcer disease go unnoticed. The patient is unaware of their status due to the lack of consciousness of the alarming symptoms and clinicians overlooking the role of specific etiological factors. One commonly overlooked factor is smoking because of the social stigma and negligence of its relationship to ulcer progression. Smoking, directly and indirectly, affects the lining of the stomach and duodenum, increases the duodenal gastric reflux with mucosal damage, decreases prostaglandin secretion, and slow and consistent exposure radically affects the prognosis allied with detained healing.[6] It decreases the production of Pepsin rather than increasing the gastric acid secretion, predisposing the mucosa as a habitat for H Pylori.[7] This study is aimed to investigate and compare the prevalence and complications of peptic ulcer disease associated with the significant role of smoking, than that of alcohol consumption. The study's objective is to confirm the vital capacity of smoking in cause of peptic ulcer disease.

2. MATERIALS AND METHODS

2.1. Study population

Many prospective and retrospective studies were analyzed, and a sample size of 100 was taken. [8,9] One hundred patients were considered for the retrospective study on ulcerative disease, out of which seventy-six were men and twenty-four were women ranging from 35 to 90 years of age. Of these 76 men, thirty-eight patients had a known case of peptic ulcer disease, and thirty-eight were unaware of their status. In females, fifteen patients were known, and nine were not known cases of peptic ulcer disease. In addition, a history of the same was obtained from two female and five male patients.

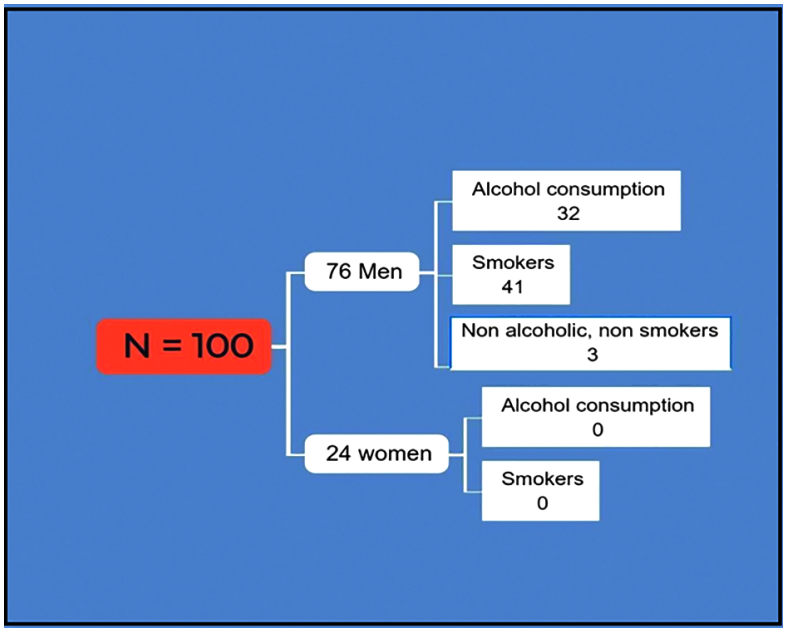

Fig 1: Data sample

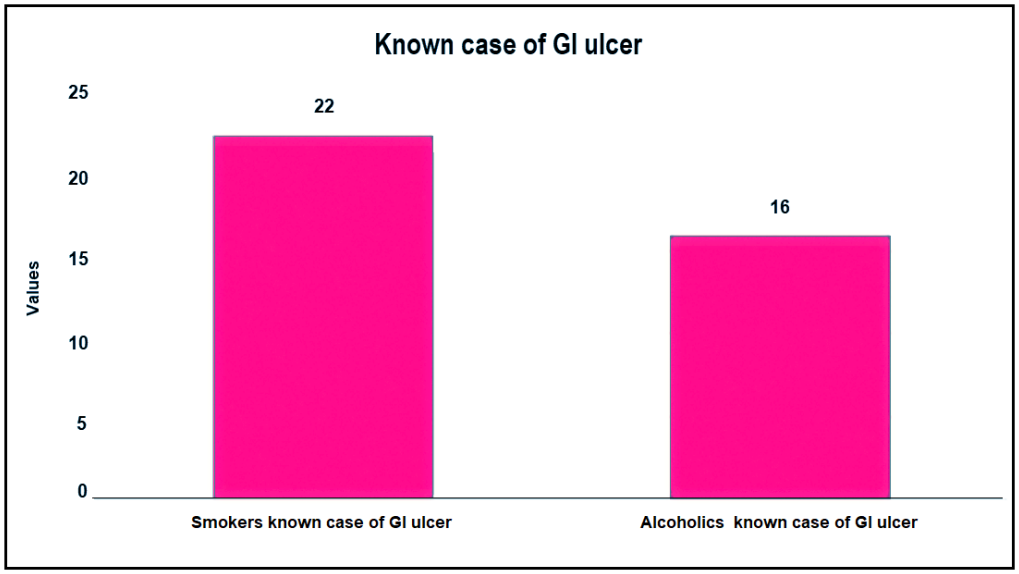

Fig 2: Smokers & alcoholics who are known cases of GI ulcer

2.2 *Inclusion criteria*

Patients diagnosed with gastric ulcer, duodenal ulcer, esophageal ulcers with or without varices, dyspeptic symptoms, and bleeding manifestations of ulcers.

2.3 *Exclusion criteria*

Patients with current gallstones and disturbed gastrointestinal physiology including vagotomy, bariatric surgery, and other malignancies. Most patients presented with two or more clinical symptoms. Around half of the study population complained of epigastric pain, sixty-five patients with heartburn, forty-three with regurgitation, and twenty-one with abdominal pain; however, since almost all patients had two or more clinical symptoms, about 92 patients presented with hematemesis in conjunction with one or the other complaints mentioned above. Most patients presented with several bouts as 1, namely forty-seven patients. 2 bouts were seen in two females and twenty-three males, and three bouts were seen in four females and eleven males. Four bouts were seen in four females and eleven males, and four bouts in one female and seven males. Finally, five bouts were seen in one female and two males only. Significant blood loss of less than 100ml was seen in sixty-four patients, forty-eight males and sixteen females, respectively. Blood loss ranging from 100 ml to less than 1000 ml was seen in twenty-four patients, seventeen males, and seven females. Seventeen male patients presented with bleeding over 1000ml and one female and five males complained of Malena. Most patients with increased bleeding, Malena, or an increased number of symptoms were high users of NSAIDs, anticoagulants, alcoholics, or smokers; exceptionally, only one patient presented no positive history but had bleeding more than 1000ml.

2.4 *Laboratory and anthropometry*

Participants were given self-reporting questionnaires irrespective of when they were diagnosed, especially to know the status of alcohol consumption, smoking, and any other drug usage, as also any other medical comorbidities, exercise, and educational status. [6] and the seventy-six men responded that thirty-two patients gave a history of alcohol consumption, and forty-one patients were known as smokers. The patients were evaluated with history taking, clinical examination, anthropometric measurements of height, weight for BMI, and blood investigation, along with upper gastrointestinal endoscopy. Gastric ulcer was diagnosed in six females and seventeen males, and duodenal ulcer in six females and only two males. One female patient notably presented with gastric and duodenal ulcers, and five male patients presented with the dual combination. Moreover, gastric erosion was noticed in two females and ten male patients. Duodenitis and fundal varices are seen in one female patient, two male patients with duodenitis, and three with fundal varices. Hemorrhagic gastritis is seen only in two male patients; the most dreaded complication, cancer stomach, was seen in one male patient.

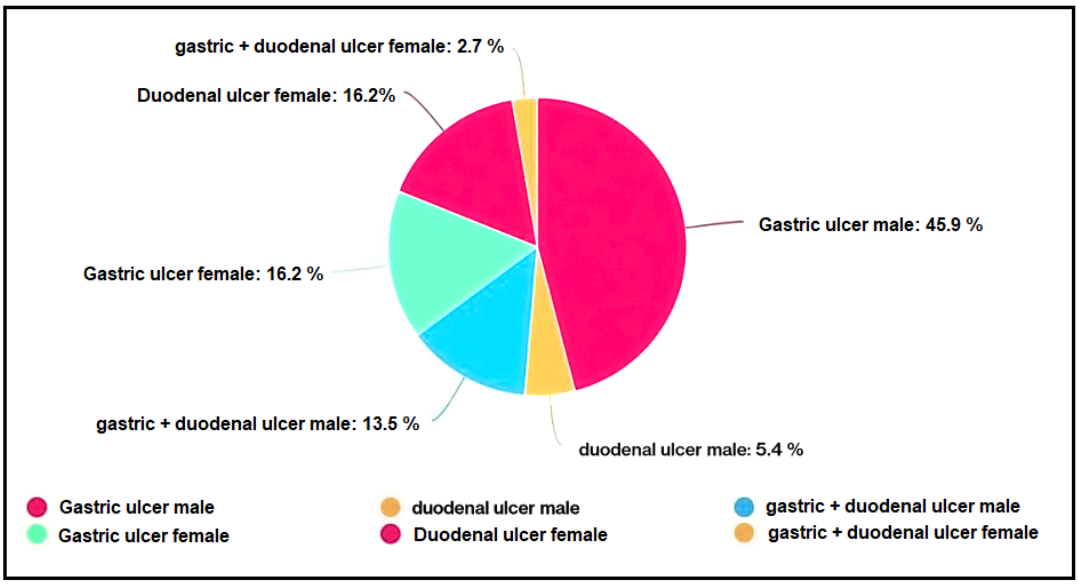

Fig 3: Data of men and women with different types of ulcer

Upper gastrointestinal flexible endoscopy, CT abdomen, and Doppler of the portal vein and splenic veins revealed esophageal varices in three females and ten males, esophagitis in six males and one female, and the esophageal ulcer was seen only in one male patient. However, esophageal varices and peptic ulcers were noticed in four patients, one female, and three males.

2.5 Reliability and Validity of self-reporting data

NHIS has shown that it is a major issue concerning the validity and reliability of self-reported data. However, many previous studies conducted on the role of alcohol on Peptic ulcer diseases have proven to provide reliable data. [6] and in this study conducted on a wide range of demography, ages from 35 to 90 years, consisting of both actively independent and dependent populations, showed that the data collected from the patients correlated well with their signs and symptoms, justifying the consistency and reliability of the information. Unlike reliability, the validity of self-reported data is limited concerning the calculation of the effects of alcohol and smoking in a study population. [3] Yet, the accuracy of the results well corroborated with the outcome, showing the role of male gender predominant smoking, thus exhibiting the study's validity.

3. RESULTS

The study group of hundred patients, first and foremost, revealed that only 50% to 60% were aware of their peptic ulcer disease, accounting for about fifty-three patients in total. And 92% of the patient's presented with hematemesis, coexisting with heartburn, regurgitation, Abdominal pain, or epigastric pain. None of the female patients presented with a history of significant etiological factors. In contrast, in males, 42% to 53% were known alcoholics or smokers, respectively, and in conjunction, 2.6% to 10.5% were taking drugs for other ailments. Concerning ulcerative lesions, 23% had a gastric ulcer, 8% had a duodenal ulcer, 6% had combined ulcers, 13% had esophageal varices, 4% had fundal varices, and 1% had esophageal ulcers and 4% with both varices and ulcer. Carcinoma stomach was associated with smoking and blood loss over 1000ml.

Table 1 - Table showing Characteristics of respondents with ulcer

Characteristics	Percentage
Sex	
Male	76%
Female	24%
Age	
35 to 44	20%
45 to 54	33%
55 to 64	27%
65 to 74	12%
75 to 84	06%
> 85	02%
Marital status	
Unmarried	01%
Married	89%
Divorced/widowed	10%
Personal history	
Smokers	41%
Alcoholics	32%

4. DISCUSSION

The epidemiology of peptic ulcer disease is 5 to 10 percent, a worldwide health issue.[10] With improvement in awareness and sanitation, the incidence of peptic ulcer disease is thought to be decreasing, however with altered food habits, sleep cycle, and personal habits, peptic ulcer disease still continues to be a threat.[11] Peptic ulcer disease, comprising of gastric and duodenal ulcers, can occur commonly due to smoking, Alcohol consumption and use of NSAIDs, and uncommonly due to Zollinger Ellison syndrome, Crohn's disease, radio, and chemotherapy, malignancies.[3] [12] These two types are differentiated based on the occurrence of symptoms concerning the consumption of food; in gastric ulcer pain occurs immediately after eating food making the patients avoid food intake, whereas in duodenal ulcer pain occurs hours after food consumption.[3] Common symptoms and signs include epigastric pain and tenderness, bloating, nausea and vomiting, alteration in weight, hematemesis, and Malena. Patients should be warned and counseled in case of unintentional weight loss, recurrent vomiting, iron deficiency anemia, and familial history.[3] The evolution of consciousness concerning the etiopathogenesis of peptic ulcer disease from a disease due to infection to that of a disease due to alterations in the mucosal barrier helps us understand the role of foreign components.[13] Peptic ulcer disease occurs with the disturbance between gastric acid and gastroduodenal mucosal defense, that is, between the protective and aggravating factors.[14] Chronic inflamed mucosal lining is more prone to ulcerative disease, which is initiated by the consumption of alcohol and smoking.[15] Cigarette smoke is a complicated composition of chemical components, tobacco-growth in different soil affects the concentrations of metals in cigarettes and hence alters smoke too. The variation in the design of the cigarette can show significance in the reproducibility of results but provides ample evidence of knowledge of possible mechanisms to explain the effects of smoking on the gastrointestinal system. [16]. Cigarette smoking has been associated with the initiation and prolongation of ulcers as well as relapse of previously treated ulcers. [17]A key role is; played reactive oxygen species, byproducts of cellular metabolism in these inflammatory conditions, [18] polymorphonuclear neutrophil cells play a vital role in ulcerogenesis with oxidative damage of the mucosa by accelerating the generation of reactive oxygen intermediates, [19] [20] which is accentuated by nicotine and smoking. It elevates the endogenous vasopressin level, which plays an aggressive role in developing gastroduodenal lesions.[21] Conversely, alcohol doesn't directly initiate the pathogenesis; it irritates the gastric mucosa, and inflamed mucosa carves its way to an ulcerative lesion or aggravates an existing ulcer.[22] Post inflammation, which may be the etiology, is the development of chronic atrophic gastritis, leading to gastric metaplasia [23] [24] and stomach adenocarcinoma.[25] Our study vividly shows that more patients are smokers than alcoholics, and the combined risk factor had increased clinical symptoms smokers presented with a minimum of 3 symptoms, and one patient with carcinoma. Alcoholic patients had exaggerated symptoms, whereas the incidence of ulcers and prolongation was stronger towards the smoking history. And 50% of the smokers had a combination of gastric and duodenal ulcers, whereas alcohol had a combined role to play along with smoking. However, this study has particularly shown the potential adverse reactions of smoking compared to alcohol consumption, which is concluded in other studies. It may be attributed to the type and poor quality of Cigarette manufacturing, the components of which have more strong reactions in the gastric mucosa. Here, it has pellucidly shown the lack of awareness of their peptic ulcer status in half the population, revealed gender predominance towards smoking and alcohol consumption habits, and the study strongly showing the drastic signs, symptoms, and also carcinoma associated with smoking primarily. Starting with a thorough history, examination, and routine blood investigation, the standard gold test for peptic ulcer is oesophago-gastro-duodeno-scopy. It is highly sensitive and has a specificity of about 90%. Other tests, such as barium swallow, can be done where EGD is contraindicated. Moreover, specific tests for H Pylori - urea breath test, stool antigen detection, and ELISA can be requested. This study investigated our patients with flexible endoscopy, with CT abdomen and Doppler for varices. All patients were initially started on antibiotics, intravenous Metronidazole, and Proton pump inhibitors such as intravenous Pantoprazole 40mg or H2 receptor blocker intravenous Ranitidine 50mg. Patients with gastric ulcers responded much better with iv Pantoprazole and H2 blockers than other drugs initiated in some patients, like iv Omeprazole. Duodenal ulcer patients responded well with PPI alone, also. Some patients were kept on quadruple therapy with iv Pantoprazole for iv Omeprazole, iv Metronidazole, iv Tetracycline, and Bismuth subsalicylate for not showing desired clinical results with the previous treatment strategy. It has shown solid improvement when seen in upper GI endoscopy and reduced risk with re-bleeding. Reduced bleeding was very well seen; moreover, patients felt symptomatic relief. Vitamin K, recombinant factor VIIa, and Fresh frozen plasma can be included in managing certain patients with a coagulation disorder. [26]

5. CONCLUSION

This retrospective comparative study of 100 patients distinctly revealed that the patients suffering from peptic ulcer disease had a compelling etiological factor as smoking, with alcohol only as an aggravating cofactor, satisfying the comparison. The data corroborated the outcome, accentuating the significance and place of smoking over that of alcohol in peptic ulcers concerning incidence, prolonged course, relapses, and dreadful complications such as bleeding and carcinoma. The study proved the inescapable role of smoking as an outstandingly unique and significant etiological factor.

6. ETHICS APPROVAL STATEMENT

The Ethics committee of Sree Balaji Medical College and Hospital, BIHER, approved the study. Patients gave written consent for conducting, using, and publishing their data for study purposes.

7. AUTHORS CONTRIBUTION STATEMENT

The authors confirm their contribution to the paper: Study conception and design by Dr. Suresh Kanna S and Dr. Sunil George Thomas; data collection by Dr. Kavuru NagaSiri; analysis and interpretation of results by Dr. Roshini S; draft manuscript preparation by Dr. Roshini S.

8. CONFLICT OF INTEREST

Conflict of interest declared none.

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