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Original Research Article

Study the frequency of substance abuse in patients with perforated peptic ulcer disease

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ABSTRACT

Background: Peptic ulcer perforation is one of the severe complications of peptic ulcer disease (PUD). Patients with perforated peptic ulcers usually are presented by the acute abdomen. In some studies, substance abuse is one of the peptic ulcer risk factors. Our study aimed to evaluate the frequency of substance abuse in patients with perforated peptic ulcers referred to Ardabil city hospital from January 2020 until March 2021.
Methods: This descriptive cross-sectional study was done on 60 patients with peptic ulcer perforation in Ardabil city hospital from January 2020 until March 2021. Data collected by a checklist and analyzed by statistical methods in SPSS version 25.
Results: Of all patients, 13 patients (19.7%) had substance abuse and all of them were male. Of all 13 patients with substance abuse, 9 (69.2%) had opium use.
Conclusions: The results showed that substance abuse among patients with peptic ulcer perforation, can be consider as a possible risk factor for peptic ulcer perforation, but more studies should perform to identify the effective factors and variables that can be main role in peptic ulcer perforation in patients.

Keywords: Peptic ulcer perforation, Peptic ulcer, Substance abuse

INTRODUCTION

A peptic ulcer is a gap in the mucous layer of the stomach or duodenum that extends to the muscularis mucosa layer. Peptic ulcer is caused by the increase of aggressive factors or the decrease of protective factors or both, which will lead to mucosa damage and as a result ulcer. Protective factors include bicarbonate secretion, mucus production, blood flow, growth factors, cell regeneration, and endogenous prostaglandins. Injurious or invasive factors include hydrochloric acid secretion, pepsin, ethanol consumption, cigarette smoking, bile reflux from the duodenum, ischemia, NSAIDs, hypoxia, and less likely *Helicobacter pylori* infection, although nowadays it is clear that most cases of ulcers are caused by *H. pylori* infection or NSAIDs use.[1]

The incidence and prevalence of PUD in developed countries, including the United States, have decreased in recent years, although PUD complications such as perforation and gastric outlet obstruction are increasing. A systematic review of epidemiological studies on PUD shows an annual incidence of 0.1-0.12% and an overall prevalence of 0.12-1.5% of PUD, in fact, most studies have shown a decrease in the rate of PUD in recent decades. Although the incidence and hospitalization rates for PUD have decreased since 1980, but PUD is still one of the most common and costly gastrointestinal diseases.[2]

Perforation is one of the common and fatal complications of peptic ulcer. Its mortality rate is high except when diagnosis and surgery are performed on time.[3] Perforated peptic ulcer is one of the most common surgical

emergencies in the world. With the improvement of medical treatments, the number of elective surgeries has been decreased, however, the incidence of perforated peptic ulcer is still increasing and is a major health problem with significant complications such as postoperative disability and death.[4]

The prevalence of PUD in Iran is 34%, which is higher than the global prevalence of 6-15%.[5] In another study conducted in the population of northwestern Iran, based on endoscopic findings, the prevalence of gastric ulcers was 3.3% and the prevalence of duodenal ulcers was 4.9%.[6] Addiction is a chronic or recurring condition for many patients. PUD is very common and according to studies conducted in 2017 in America, nearly 7.2% of people over the age of 12 were suffered to PUD at last year, of which 5.3% consumed alcohol and 2.8% consumed drugs. The prevalence of drug use in Iran is 2.1% among 1.12 million Iranian adults.[7-8] Long-term exposure to opioids may lead to hypersensitivity reactions, ischemia, and hypotension, and the combination of these factors with opioid-related motility defects in the stomach and intestines can be associated with perforation complications and epithelial damage.[9]

Due to the existence of few studies that deal with the relationship between drug use and peptic ulcer perforation, and since clinical observations in the field of peptic ulcer perforation surgery show the possibility of a high incidence of peptic ulcer perforation among drug users, therefore this study It was done with the aim of investigating the relationship between drug abuse and peptic ulcer perforation.

METHODS

This is a descriptive-cross-sectional study on 66 patients with a diagnosis of peptic ulcer who were referred to Fatemi hospital between January 2020 and March 2021. All patients referred to Ardabil city hospital with a history of sudden onset of severe abdominal pain that was widespread were examined. Other possible accompanying symptoms include hematoma. The diagnostic hallmark of peptic ulcer perforation included the triad of severe and sudden abdominal pain, tachycardia, and abdominal rigidity. After taking the history, the findings that were in favor of the diagnosis included abdominal tenderness, rebound tenderness and guarding. In the following, the patients were subjected to imaging examinations, and the findings of the imaging studies that were in favor of the occurrence of peptic ulcer perforation included: the presence of free air under the diaphragm in the abdominal radiograph and extraluminal gas in the abdominal CT scan. Other routine paraclinical studies including CBC, liver function tests, examination of serum electrolytes, urea, creatinine, amylase, lipase and other required tests were performed in these patients. In the following, after the diagnosis of peptic ulcer perforation, the patients were transferred to the operating room for surgery, and by directly observing the lesion during surgery and determining the location of the perforation, the information were recorded in a checklist. In order to check *H. pylori* contamination, stool samples were taken from all patients suffering to peptic ulcer perforation and had drug abuse, and sent to the laboratory to check the fecal antigen of *H. pylori* and the results were recorded. Other information includes age, gender, drug abuse, type, dose and duration of used drug, method of drug use, history of peptic ulcer, history of previous peptic ulcer perforation, smoking and duration of smoking were recorded through a checklist. All patients diagnosed with perforated peptic ulcer in the age range of 15 to 60 years were included in the study, and patients outside the defined age range, recent use of NSAID, corticosteroid, anticoagulant and people who did not want to cooperate were excluded from study. The study was registered in ethics committee of university with code IR.ARUMS.REC.1398.565.

Chi-square test used to investigate relationship between qualitative variables including drug abuse with peptic ulcer perforation site and history of peptic ulcer. Other data analyzed using descriptive statistics in SPSS ver 25.

RESULTS

A total of 66 patients were included in the study, of which 48 were men (72.7%) and 18 were women (27.3%). The 13 of the patients were drug users, all of whom were men. The highest age range of perforation incidence was 45-60 years old with 65.2% which 69.2% of drug users were in this age range. The most commonly used drug was opium with 69.2%. Consumption of 2-3 gr of opium was the most frequent with 30.7%. Among drug users, 30.8% had used opium for less than 10 years and 53.8% had used opium for 10-20 years. Among drug users, 7.7% used heroin for less than 5 years and 7.7% for more than 10 years. Among the drug users, 1 person (7.7%) had used glass for more than 10 years. Among the drug users, 1 person (7.7%) had used cannabis for less than 3 years. 10 people (15.2%) used inhalation and 3 people (4.5%) had both oral and inhalation use. Out of 9 people who only used opium, 7 people (77.8%) only used inhalation and 2 people (22.2%) used oral and inhalation. Only 15 patients (22.7%) had a history of peptic ulcer. Among the people who had a history of peptic ulcer, only 1 person had a history of peptic ulcer. None of the patients had a previous history of peptic ulcer perforation. Most of the perforation sites with 59.1% were in the prepyloric region (Table 1).

Table 1: Location of peptic ulcer perforation.

Perforation site	N	Percentages (%)
Small curvature	5	7.6
Pyloric lobe	39	59.1
Pylorus	4	6.1
Duodenum	17	25.8
Small and prepyloric curvature	1	1.5

Table 2: Type of drug used in each peptic ulcer perforation site.

Type of drugs/site		No drug use	Opium	Heroin	Cannabis	Opium + crystal	Opium + heroin
Small curvature	N	3	2	0	0	0	0
	%	60	40	0	0	0	0
Pyloric lobe	N	31	4	1	1	1	1
	%	79.5	10.3	2.6	2.6	2.6	2.6
Pylorus	N	3	1	0	0	0	0
	%	75	25	0	0	0	0
Duodenum	N	15	2	0	0	0	0
	%	88.2	11.8	0	0	0	0
Small curvature and pyloric lobe	N	1	0	0	0	0	0
	%	100	0	0	0	0	0

Among the people who used drugs, 2 people (15.4%) had perforation in the lesser curvature, 8 people (61.5%) in prepylorus, 1 person (7.7%) in the pylorus, and 2 people 4 (15%) in duodenum. There was no significant relationship between drug use and peptic ulcer perforation site. Of the people who had perforation in the small curvature, 2 people (40%) had opium use (Table 2).

Among people who used drugs, 10 people (76.9%) were infected with *H. pylori* and 3 people (23.1%) were not infected with *H. pylori*. Among the 66 patients, 28 people (42.4%) and all of drug users were smokers.

DISCUSSION

In the current study, 66 patients with peptic ulcer perforation were investigated, among them 13 (19.7%) were using various drugs that all of 13 person were men. Kahrom et al showed that both drug use and sudden cessation of drug use can be a risk factor for peptic ulcer perforation, and most of the examined patients were male, which is similar to the present study, it can be said that male gender is associated with high risk of drug use and high risk of perforation incidence. Also by considering the high incidence of perforation in the age range of 45-60 years old, it can be said that old age is a risk factor for the occurrence of peptic ulcer perforation.[10] In 2016, Sarkar et al conducted a study that showed that gastrointestinal diseases, including gastrointestinal ulcers and upper gastrointestinal bleeding, were more common in people with substance use disorder.[11] In 2001, Weintraub and colleagues concluded that drug and alcohol consumption significantly increases the risk of diseases, especially digestive diseases and hospitalization.[12] In the present study, it was also observed that among the patients with peptic ulcer perforation, 19.7% of people were drug users, which indicates that drug use can be one of the risk factors for the occurrence of peptic ulcer perforation. In terms of the type of consumed drug, opium was the most consumed drug in the current study with 13.6%. In Mahdi Kahrom et al study, opium was the most commonly used drug with 62.9%, followed by heroin with 22.9%.[10] In the study of Sarkar et al the average incidence of gastrointestinal diseases was reported to be high with tobacco use, then alcohol use, and finally opioid use.[11] In the study of Nasrallah et al of the 88 patients with peptic ulcer perforation on whom the study was conducted, opium consumption was second after smoking with 44%.[13] Based on these studies and the present study, it can be concluded that opium consumption can play a greater role in the occurrence of peptic ulcer perforation. Regarding the location of perforation, among all the patients in the present study, the highest location of perforation was in the prepyloric region with 59.1% and the second place was the duodenum with 25.8% and the lowest location of perforation was related to the small curvature with 7.6%. Among drug users, the highest perforation area was the pre-pyloric region with 61.5% and the lowest perforation area was the pyloric region with 7.7%. There was no significant relationship between perforation site and drug use. In the study by Kahrom et al the most frequent location of perforation with 94% was in the post-pyloric area.[10] In 2018, Sarus et al published a case report in which perforation followed by PUD following long-term and chronic use of synthetic cannabinoids occurred in the region of the first segment of the duodenum.[14] In the present study, a case of perforation following cannabis consumption was recorded, which was in the prepyloric region, unlike the Sarus study, and the duration of cannabis consumption was 3 years. According to these findings and the variety of reported perforation sites, the non-significance of the perforation site with drug use can also be justified.[14] In the present study, 42.4% of all patients and 100% of drug users were smokers. In Sarkar et al study, a high average of gastrointestinal diseases was reported with tobacco use, then alcohol use, and finally opioid use.[11] In Nasrallah et al study, 63% of 88 patients with peptic ulcer perforation had a history of smoking, which indicates the role of smoking in digestive problems and peptic ulcer perforation.[13]

Regarding the way of drug use, no similar study was found that investigated it in people with peptic ulcer perforation. 13 patients who used narcotics all used inhaled narcotics and in 3 cases (23.1%) oral opium was also used. This finding shows that further studies should

be designed and implemented to investigate the possible relationship between drug use and the occurrence of peptic ulcer perforation. In the present study, out of 13 patients who used narcotics, 10 (76.9%) were infected with *H. pylori*. According to the sources, *H. pylori* infection is almost always present in chronic active gastritis in most patients with duodenum ulcer (80% to 95%) and gastric ulcer (60% to 90%), and the frequency of infection with *Helicobacter pylori* in this study is the range mentioned in the sources.[15] Among the innovations of the present study is the investigation of the duration of use of each drug in patients with peptic ulcer perforation, which was not found in the literature review that investigated this issue. In general, it seems that the longer the duration of drug use, the higher the probability of peptic ulcer perforation. Failure to receive accurate information from patients may have influenced the accuracy of the obtained results. In this study, the examination of drug use in patients was based on the patient's self-report, and it was possible that some of the patients had hidden their drug use.

CONCLUSION

The results of this study showed that due to low percentage (19.7%) of drug use among studied patients, it can be considered as a possible risk factor in the occurrence of peptic ulcer perforation, but more studies should be done in order to identify effective factors in peptic ulcer perforation, it should be done by examining variables and other factors. It is recommended to conduct further studies with a large population and a longer period of time. Conducting further studies with control group to investigate possible relationship between peptic ulcer perforation and drug use. Conducting independent studies on each type of drug alone to reduce possibility of error in study results is essential.

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