Risk Factors of Peptic Ulcer Disease in Khorramabad city, Southwest of Iran: A Case Control Study

Kourosh Ghanadi (1)
Khatereh Anbari (2)

(1) Associate Professor, Department of Internal Medicine, Faculty of Medicine, Lorestan University of Medical Sciences, Khorramabad, Iran
(2) Associate Professor, Social Determinant of Health Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran.

Corresponding Author:
Kourosh Ghanadi, MD
Shahid Rahimi Hospital, Department of Internal Medicine,
Khorramabad, Iran
Tel: + 98 6633336136
Email: Koroush.Ghanadi@gmail.com

Abstract

Background & Aims: The aim of this study is to determine the demographic characteristics, endoscopic findings, morphological and pathological characteristics of the ulcer in patients with peptic ulcer disease, and also to compare the odds ratio of exposure to possible risk factors of disease in patients with peptic ulcer disease and a healthy control group in Khorramabad city.

Materials & Methods: In the present case-control research, all the patients who had referred to a digestive tract sub-specialist's office in Khorramabad in 2015 and had been diagnosed with peptic ulcer disease via endoscopy and pathological studies were enrolled in the study. The control group were selected from among those referring to the ophthalmological and dermatological clinics of the Shahid Rahimi Hospital. The data collection instrument used in this study was a questionnaire that included items related to the demographic information of the patients, and also questions regarding the patient's background as to smoking, alcohol consumption, NSAIDs or corticosteroids usage, and peptic ulcer disease among first-degree relatives. The same data were collected from the members of the control group. All patients signed written consent forms regarding their participation in the study. The data were analyzed using SPSS software.

Findings: In the present study, 60 patients with PU and 60 subjects as the control group were examined. Most patients were between 30 and 44 years old (60%). In the present study, the mean age of patients with PUD was 35 ± 10.6 years. Among all patients with PUD, three (5%) had gastric ulcer and 57 (95%) had duodenal ulcer. Anatomical location of all ulcers (3 cases) was in the small curvature of stomach and 47.4% of duodenal ulcers were in the anterior wall. In multivariate analysis, which was performed using logistic regression, there was a statistically significant relationship among history of NSAID use (PV = 0.047) and smoking history (PV = 0.042) with occurrence of PUD.

Conclusion: In general, peptic ulcer is considered as a common and serious problem all around the world and 5 to 10% of the population are affected by PU during their life. Therefore, the incidence and complications of this disease can be significantly prevented by correcting risk factors and lifestyle, as well as by improving the health conditions of the community.

Key words: Peptic ulcer disease, Duodenal Ulcer, Gastric Ulcer, NSAID, Smoking.

Introduction

Peptic Ulcer Disease (PUD) is a common disease in the digestive system which includes gastric and duodenal ulcers. In the United States, the prevalence of PUD is about 12% in men and 10% in women. Researchers believe that 15,000 deaths occur each year as a result of PUD complications. The economic effect of this disease is considerable so that each year $ 10 billion is spent in the United States for the disease and its complications regarding direct and indirect healthcare costs (1). Peptic ulcer is ranked thirty in the world and thirty-first in Iran in terms of prevalence and disease burden (2). Duodenal Ulcer (DU) occurs in 6 to 15 percent of the western population. Incidence of these ulcers has steadily decreased from 1960 to 1980 and has remained constant since then. In higher ages, gastric ulcers are more likely to occur as compared with duodenal lesions so that statistics suggest a high incidence of this type of ulcer in the sixth decade of life. More than half of gastric ulcers occur in men and their prevalence is less than duodenal ulcers; this can be attributed to the fact that gastric ulcer is asymptomatic in most cases so that for a large number of patients, this disease is diagnosed after the occurrence of complications. Unlike duodenal ulcers, gastric ulcers have the capability to become malignant (1). Damage caused by Helicobacter pylori infection and the use of NSAIDs result in most peptic ulcers; many environmental factors are also effective in causing this disease, including infectious causes such as cytomegalovirus, herpes, as well as some drugs, including bisphosphonates, chemotherapeutic agents, crack, cocaine, potassium chloride and glucocorticoids. Epidemiological studies suggest that smoking increases the occurrence likelihood of peptic ulcer disease (1). Moreover, physiological stresses and psychosocial stress play an important role in the occurrence of peptic ulcer (3). Furthermore, in a number of studies, the role of psychological factors in the development of gastric ulcer has also been mentioned; this effect is exerted through an increase in acid secretion due to psychological stress (3 and 4). Clinical symptoms of this disease include epigastric pain, dyspepsia and abdominal distension, nausea and vomiting, weight loss and anorexia that can be accompanied with anemia of iron deficiency and the presence of hidden blood in the stool.

PUD can have a significant influence on patients' quality of life. Based on the findings of a number of studies, improving the quality of life can have a satisfactory effect on the treatment of peptic ulcer (5).

The aim of this study is to determine the demographic characteristics, to investigate the endoscopic findings, to determine the morphological and pathological characteristics of the ulcer in patients with peptic ulcer disease, and also to compare the odds ratio of exposure to possible risk factors of disease in patients with peptic ulcer disease and healthy control group in Khorramabad city.

Materials and Methods

In the present case-control research, all the patients who had referred to a digestive tract sub-specialist's office in Khorramabad in 2015 and had been diagnosed with peptic ulcer disease via endoscopy and pathological studies, were enrolled in the study. In the present research, only patients residing in Khorramabad and its suburban areas were studied. The census taking sampling method was used. 60 patients diagnosed with peptic ulcer disease were selected as the volume of the sample. The control group that matched the experimental group in terms of age and sex were selected from among those referring to the ophthalmological and dermatological clinics of the Shahid Rahimi Hospital, provided that they had no gastrointestinal or rheumatologic diseases and no backgrounds of chronic physical and mental illnesses. The data collection instrument used in this study was a questionnaire that included items related to the demographic information of the patients, and also questions regarding the patient's background as to smoking (smoking more than 10 cigarettes per day for at least one year), alcohol consumption (with DSM-IV-TR criteria, and alcoholic products with daily consumption including beer, vodka, whisky, wine, fortified wine and hard liquor), NSAIDs or corticosteroids usage, and peptic ulcer disease among first-degree relatives. The same data were collected from the members of the control group. All the diagnostic studies for the diagnosis of the disease were carried out by a digestive tract sub-specialist. The validity of study was confirmed by expert panel.

All patients signed written consent regarding their participation in the study. The data were analyzed using SPSS software. Descriptive statistical methods, and the Chi-square test were used. In order to determine the intensity of the relationship between familial backgrounds of peptic ulcer disease and the development of PUD, the odds ratio estimate was used with a confidence interval of 95%.

Findings

In the present study, 60 patients with PU and 60 subjects as control group were examined. Most patients were between 30 and 44 years old (60%). In the present study, the average age of patients with PUD was 35 ± 10.6 years. The youngest patient was 16 years old and the oldest patient was 57 years old. There was no difference in the average age of patients with PUD and control group (PV = 0.25). Most of the patients (60%) were male. In the present study, the sex ratio of male to female was 1.5 to 1. There was no significant difference between the two groups in terms of sex distribution (PV = 0.44). In the present study, the majority of patients (85%) were married and most of them (40%) had secondary education or diploma; 25% of patients were high school or university students, and 20% of patients were workers. There was no statistically significant difference in the frequency distribution of marital status, educational level, and occupation of patients and control group (Table 1). In this study, 58.3% of patients and 56.7% of the subjects in the control group had blood type O. The difference in the frequency distribution of blood

types of the two groups was statistically significant (PV = 0.047) (Table 1). The mean of body mass index in patients with PUD was significantly higher than that of those without PUD (PV = 0.026). Among all patients with PUD, three (5%) had gastric ulcer and 57 (95%) had duodenal ulcer. Morphologically, all ulcers were of the Clean Base type (100%) and anatomical location of all ulcers (3 cases) was in the small curvature of stomach and 47.4% of duodenal ulcers were in the anterior wall (Table 2). Size of 70% of peptic ulcers in the patients under study was 1 and less than 1 cm and size of other ulcers was in the range of 1 to 3 cm. The number of peptic ulcers was one in 48 patients (80% of cases) and in 12 patients (20% of cases) more than one ulcer was diagnosed. The result of Helicobacter pylori test was positive in 57 patients (95%).

Epigastric pain (95%) and nausea (36.7%) were the most common clinical symptoms of peptic ulcer in patients under study. The history of regular smoking was positive in 15% of patients with PUD while it was 5% in the control group and this difference was statistically significant based

on chi-square test (PV = 0.038) (Table 3). Estimated odds ratio for PUD in smokers was 4.75 times higher than non-smokers. 13.3% of patients and 3. 3% of subjects in the control group used to use non-steroidal anti-inflammatory drugs. This difference was statistically significant based on Chi-square test (PV = 0.048). Odds ratio of second-line peptic ulcer disease to NSAID use was 4.16 times higher than control group (Table 4). History of alcohol use was not positive in any of the patients with PUD and the subjects of the control group. History of regular corticosteroid use was positive in 4 patients with PUD (6.7%) while only 1 subject in the control group (1.7%) had history of corticosteroid use, and this difference was not statistically significant (PU = 0.17). History of PUD was positive in 8.3% of patients with PUD and 5% of subjects, and this difference was not statistically significant (PV = 0.46). Moreover, history of the use of anticoagulation drugs was not positive in any of the two groups. In multivariate analysis which was performed using logistic regression, there was a statistically significant relationship among history of NSAID use (PV = 0.047) and smoking history (PV = 0.042) with occurrence of PUD.

Table 1: Frequency distribution of demographic characteristics of patients with PUD and control group

Type of variable		Patients with peptic ulcer; Number (percent)		Number of healthy people: Number (percentage)		p-Value
Sex	Male	36	60	40	66.7	0.44
	Female	24	40	20	33.3	
Marital status	Married	51	85	46	76.7	0.24
	Single	9	15	14	23.3	
Education	not literate	3	5	3	5	0.44
	high school and less	18	30	16	26.7	
	secondary school & diploma	24	40	18	30	
	Academic	15	25	23	38.3	
Occupation	Farmer	3	5	6	10	0.62
	worker	12	20	10	16.7	
	businessman	10	16.7	13	21.7	
	house keeper	15	25	14	23.3	
	student	6	10	7	11.7	
	Military	6	10	3	5	
	Unemployed	6	10	2	3.3	
	Public sector	2	3.3	5	8.3	
Blood type	AB	3	5	5	8.3	0.047
	A	14	23.3	21	35	
	B	8	13.3	12	20	
	O	25	58.3	22	36.7	

Table 2: Frequency distribution of anatomical location of involvement in patients with duodenal

Anatomical location of involvement	Number	Percent
Anterior wall	27	47.4
Posterior wall	6	10.5
Upper wall	9	15.8
Lower wall	6	10.5
Lower and anterior wall	3	5.3
Lower and upper walls	6	10.5
Total	57	100

Table 3: Comparison of frequency distribution of regular smoking history in patients with PUD and control group

Regular smoking history	With		Without		Total		p-Value	OR	95%CI-OR
	Number	Percent	Number	Percent	Number	Percent			
Patients	9	15	51	85	60	100	0.038	4.75	1.61-8.2
Control	3	5	57	95	60	100			

Table 4: Comparison of frequency distribution of regular NSAID usage in patients with PUD and control group

Regular NSAID use	With		Without		Total		p-Value	OR	95%CI-OR
	Number	Percent	Number	Percent	Number	Percent			
Patients	8	13.3	52	86.7	60	100	0.048	4.16	1.8-9.1
Control	2	3.3	58	96.7	60	100			

Discussion and Conclusion

Despite the significant decrease in the mortality rate of peptic ulcer disease in recent decades, peptic ulcers continue to be a common and complicated problem affecting a large part of the population, resulting in high health costs in different dimensions of physical and mental health. The present study was carried out in order to investigate the risk factors of peptic ulcers in Khorramabad city. Among 60 examined patients, 95% suffered from duodenal ulcer and 5% suffered from gastric ulcer. It was revealed in a study performed by Baranizadeh et al. in a referral center in Tehran that 94.4% of all patients with PU were suffering from duodenal ulcer and 5.6% were suffering from gastric ulcer. The results of the present study are in line with the results of the mentioned study (7). The average age of patients in the leading study was 35 years and the highest frequency of the disease was in the age group of 30-44 years. In the study carried out by Baranizadeh et al., the average age of patients with gastric ulcer was 54.5 years and the average age of patients with duodenal ulcer was 51.5 years. The difference in the average age of patients in the present study with the average age of patients in the Baranizadeh study can be attributed to the differences between the two regions; differences such as different eating habits, genetic aptitudes of PUD involvement of the tribal peoples of Lor and Lak who inhabi Lorestan province in comparison with Turk and Fars residents of Tehran province as well as a different risk of environmental factors. In the study conducted by Baranizadeh et al., all patients referring to a referral center in Tehran as well as patients admitted to the hospital were examined. Some of these patients were suffering from complicated ulcers as well (7). In the present study, the majority of patients with PU were male and the sex ratio of male to female was 1.5 to 1. Moreover, in the investigation performed by Amnan et al. in the United States, the ratio of males to females suffering from duodenal ulcer was 4 to 1 and the ratio of males to females suffering from gastric ulcer was 2 to 1 (8). Furthermore, in the study conducted by Hwang in Taiwan, 67% of patients suffering from PU were male and 55.9% were between 20 and 45 years old (9).

The findings of this study indicated that most patients with PU were married and had secondary education or diploma, and most of them were housewives and workers. In addition, in the study done by Amnan in the United States, high age, low level of education, low family income, and smoking were counted as risk factors for peptic ulcer (8). Therefore, it should be noted that low levels of literacy can lead to unhealthy lifestyles, improper dietary habits and increased risk of disease. In this study, almost all subjects with PU (95%) were infected with H. pylori infection. In the study carried out by Baranizadeh, 93.9% of patients with gastric ulcer and 100% of patients with duodenal ulcer were infected with H pylori (7). Moreover, in several studies done in Southeast Asia and China, the prevalence of H pylori in patients suffering from PU was found to be between 92.6% and 95.7% (13-10). Whereas, according to studies conducted in European countries, the prevalence of H pylori infection in patients suffering from PU ranged from 33.9% to 57.7% (14-15). Therefore, according to the results obtained from comparing these statistics, the prevalence of Helicobacter pylori infection is lower in European societies as compared with Asian societies; it is likely that the prevalence of ulcerogenic H-pylori species is the same in the Iranian and Chinese population. It is reported in an investigation that the prevalence of H pylori is 82% in patients with PU in Van, Turkey (16). In the present study, it manifested that regular smoking and regular use of NSAIDs are among risk factors that increase the risk of the prevalence of PU factor and the odds ratio for PU was 4.75 times higher in smokers as compared with non-smokers, and the odds ratio for NSAID use was 4.46 times. In the examination performed by ARO, cigarette smoking, aspirin use, and obesity were identified as risk factors for the prevalence of PU (17). In the study conducted by Baranizadeh et al. in Tehran, Helicobacter pylori, smoking, male sex and place of residence in the city were considered as major risk factors for duodenal ulcer, and H-pylori infection, regular smoking, and NSAIDs were considered as major risk factors for gastric ulcers (7). NSAIDs cause the failure of mucosal defense mechanisms and since it is difficult to identify patients at higher risk for complications and deaths from using NSAIDs due to the absence of warning signs, the probability of side effects of NSAID use increases in higher ages, when there is a history of ulcer, and when corticosteroid and anticoagulant drugs are co-administered. In the study performed by Shou-lee et al., it was found that there is a significant relationship between high consumption of aspirin and PU occurrence (18). In a study carried out in Taiwan, smoking

was considered a risk factor for the occurrence of PU (19). The results of the present study are in line with the results of the other mentioned investigations. In our study, prevalence of smoking was 15% and prevalence of NSAID use was 13.3% in patients with PU. These results indicate that smoking may play a role as an important factor in the ethiopathogenesis of PU in our region. In fact, many other studies present a strong positive relationship among cigarette smoking, appearance of ulcer, and delay in ulcer healing (18 and 20). In this study, none of the patients with PU were alcoholic, which may be related to the low prevalence of alcohol consumption in our region. In some studies, genetic predisposition has been suggested as a risk factor for PU. In one study, it was shown that the incidence of ulcers was three times more in the immediate relatives of patients with duodenal ulcers compared with normal people (19). However, in our study, there was no significant difference between the occurrences of ulcer in the immediate relatives of patients with peptic ulcer compared with the control group; this non-significant difference is perhaps related to smaller sample size in this study and incorrect responses provided by some participants due to a failure in recall. Moreover in the present study, the blood type of most patients was O. In the study carried out by Lau, blood type O was mentioned as a genetic risk factor for PU disease (21). In this study, the mean of body mass index of patients with PU disease was significantly higher than that of control group. Furthermore, in the study done by Baranizadeh, patients with DU had a higher body mass index than patients who were not suffering from DU (7). In the present study, the majority of ulcers occurred in duodenal anterior wall. In addition, in the study that was performed by Turk Dogan in Turkey, 80% of ulcers were located in the first part of the duodenum and at the anterior level (16). Our study also had some limitations. This study was based on the endoscopy of some outpatients referring or referred to a private multi super specialty center and did not include population-based studies. And since patients were not hospitalized, perhaps the results of this study cannot be generalizable to the entire community of patients with peptic ulcer disease. In general, peptic ulcer is considered as a common and serious problem all around the world and 5 to 10% of the population are affected by PU during their life. Therefore, the incidence and complications of this disease can be significantly prevented by correcting risk factors and lifestyle, as well as by improving the health conditions of the community.

References

1) Dan Longo, Anthony Fauci, Dennis Kasper , Stephen Hauser, J. Jameson, Joseph Loscalzo Harrison's Principles of Internal Medicine.18th Edition, Volumes 2

2) Babaee G, Keshvarz M, Shaigan M. Effect of health education program on quality of life in patients undergoing coronary artery bypass surgery. ACTA.Medica Anica 2007; 45(1): 69-75.

3) Han KS. The effect of an integrated stress management program on the psychologic and physiologic stress reactions of peptic ulcer in Korea. Int J Nurs Stud. 2002. Jul;39(5):539-48.

4) Barkun A, Leontiadis G. Systematic review of the symptom burden, quality of life impairment and costs associated with peptic ulcer disease. Am J Med. 2010;123(4):358-66

5) Zboralski K, Florkowski A, Talarowska-Bogusz M, Macander M, Gałecki P. Quality of life and emotional functioning in selected psychosomatic diseases. Postepy Hig Med Dosw 2008; 62(1): 36-41.

6) J. Y. Sung, E. J . Kuipers & H. B. El-Serag. Systematic review: the global incidence and prevalence of peptic ulcer disease. Aliment Pharmacol.2009;29(9):938–96

7) Barazandeh F, Yazdanbod A, Pourfarzi F, Ghajarieh Sepanlou S, Derakhshan MH, Malekzadeh R. Epidemiology of Peptic Ulcer Disease: Endoscopic Results of a Systematic Investigation in Iran. Middle East Journal of Digestive Diseases. 2012 ;.4(2):90-96

8) Amnon Sonnenberg, MD, and James E. Everharti, MD, MPH. The Prevalence of Self-Reported Peptic Ulcer in the United States. American Journal of Public Health. February 1996,86(2):200-205

9) Hwang-Huel Wang, Huen-Wen Xiao, Chien Chang Liao. Factors associated with peptic ulcer in Taiwan: a case-control study. Mid-Taiwan Journal of Medicine.2006;11(1):1-8.

10) Xia B, Xia HH, Ma CW ,Wong KW, Fung FM, Hui CK, et al. Trends in the prevalence of peptic ulcer disease and Helicobacter pylori infection in family physician-referred uninvestigated dyspeptic patients in Hong Kong. Aliment Pharmacol Ther 2005; 22(3): 243 – 9.

11) Wong SN, Sollano JD, Chan MM , Carpio RE, Tady CS, Ismael AE,, et al. Changing trends in peptic ulcer prevalence in a tertiary care setting in the Philippines: a seven-year study. J Gastroenterol Hepatol. 2005; 20(4):628 – 32

12) Dong WG, Cheng CS, Liu SP, Yu JP. Epidemiology of peptic ulcer disease in Wuhan area of China from 1997 to 2002. World J Gastroenterol 2004; 10(22): 3377 – 9.

13) Li Z, Zou D, Ma X, Chen J, Shi X, Gong Y, et al. Epidemiology of peptic ulcer disease: endoscopic results of the systematic investigation of gastrointestinal disease in China. Am J Gastroenterol 2010;105(12):2570-7

14) Aro P, Storskrubb T, Ronkainen J, Bolling-Sternevald E, Engstrand L, Vieth M, et al. Peptic ulcer disease in a general adult population: the Kalixanda study: a random population-based study .Am J Epidemiol 2006; 163(11):1025 – 34.

15) Zagari RM, Law GR, Fuccio L, Pozzato P, Forman D, Bazzoli F. Dyspeptic symptoms and endoscopic findings in the community: the Loiano-Monghidoro study. Am J Gastroenterol 2010;105(3);565 – 71.

16) Turkodogan, M.K, Hekim, H, Tuncer I, Aksoy H. The epidemiological and endoscopic aspects of peptic ulcer disease in Van region. Eastern Journal of Medicine 1999; 6(1):6-9.

17) Aro P, Storskrubb T, Ronkainen J, Bolling-Sternevald E, Engstrand L, Vieth M, et al. Peptic ulcer disease in a general adult population: the Kalixanda study: a random population-based study .Am J Epidemiol .2006;163:1025 – 34.

18) Shou-Wu Lee, Chi-Sen Chang, Teng-Yu Lee, Hong-Zen Yeh, Chun-Fang Tung, Yen-Chun Peng. Risk factors and therapeutic response in Chinese patients with peptic ulcer disease. World J Gastroenterol. 2010;16(16):2017-2022

19) Hwang-Huel Wang, Huen-Wen Xiao, Chien-Chang Liao, Siu-Wan IP. Factors associated with peptic ulcer in Taiwan: A case-control study. Mid-Taiwan Journal of Medicine.2006;11(1):1-8.

20) Rosenstock S, JÃ¸rgensen T, Bonnevie O, Andersen L. Risk factors for peptic ulcer disease: a population based prospective cohort study comprising 2416 Danish adults. Gut.2003;52(2):186-93.

21) Lau JY, Sung JJ, Metz DC, Howden CW. Systematic review of the epidemiology of complicated peptic ulcer: incidence, recurrence, risk factors and mortality. Digestion. 2011;84(2):102-13