

FACTORS ASSOCIATED WITH PEPTIC ULCER: A SINGLE CENTRE EXPERIENCE AT TERTIARY CARE HOSPITAL OF KHYBER PAKHTUNKHWA

Niaz Ali¹, Abid Ullah², Sohail Akhtar³, Syed Wadood Ali Shah⁴, Muhammad Junaid⁴

ABSTRACT

Objective: To find out association between peptic ulcer (PU) and high risk predictors like sex, smoking, use of non-steroidal anti-inflammatory drugs (NSAIDs) and *H. pylori* infection.

Methodology: This retrospective study was conducted at the medical unit of the Saidu Sharif Swat, months from October 2011 to January 2012 on 72 adult endoscopically proven patients of PU having previous history of smoking, ingestion of NSAIDs and presence of *H. pylori* infection on Urease test. Data was collected on structured proforma including patients demographics, clinical presentation and major risk predictors. Relevant statistics were carried out to see an association of these high risk predictors with PU.

Results: PU was more prevalent in age of 21-40 years with associated predictors like smoking, use of NSAIDs and *H. pylori* infection. Of the 72 patients, 68.05% patients were male and 31.94% were female. Smoking has a high incidence of 52.63%, and the use of NSAIDs shared 31.03% in patients of age 31-40 years. *H. pylori* infection was having 30% and 32% incidence in patients of groups 31-40 and 41-50 years, respectively. Smoking has a high Neg. R^2 (26.82%) while for use of NSAIDs is 7.42%. Smoking + sex + NSAIDs + *H. pylori* have Neg. R^2 score 48.09% ($P > 0.05$).

Conclusion: Smoking, sex, use of NSAIDs and *H. pylori* infection carries strong association in patients having peptic ulcer. As smoking alone is found to have stronger association with PU, public awareness program regarding hazards of smoking is recommended.

Key Words: Smoking, NSAIDs, Peptic ulcer, *H. Pylori*.

This article may be cited as: Ali N, Ullah A, Akhtar S, Shah SWA, Junaid M. Factors associated with peptic ulcer: A single centre experience at tertiary care hospital of Khyber Pakhtunkhwa. Khyber Med Univ J 2013; 5(1): 18-21

¹ Department of Pharmacology Khyber medical University (KMU), Institute of Basic Medical Sciences (IBMS), Hayatabad Peshawar Pakistan

Email: niazpharmacist@yahoo.com

² Department of Pharmacy, Shaheed Benazir Bhutto University, Sheringal Dir Upper, Dir Khyber Pakhtunkhwa, Pakistan

³ Department of Statistics, University of Malakand, Pakistan

⁴ Department of Pharmacy, University of Malakand, Pakistan

Date Submitted: September 21, 2012

Date Revised: March 12, 2013

Date Accepted: March 15, 2013

1980's, the major causes responsible for development of peptic ulcer were stress, excessive secretion of acid, eating too much fatty food, rich food with spices, and the use of alcohol and coffee. Later on, other causative agents were also included to the list like *Helicobacter pylori* (*H. pylori*), use of non-steroidal anti-inflammatory drugs (NSAIDs), smoking, co-administration of corticosteroids and NSAIDs, co-administration of warfarin and NSAIDs, heredity, unusual causes like Crohn's disease and tuberculosis,^{1,4} or sometimes it may be idiopathic.⁵

In United States, peptic ulcer related mortality rate is 7-10% in the admitted patients.⁶ With respect to gender the prevalence rate of peptic ulcer is 11-20% in males and 8-11% in females.⁷ In India, the males are about eighteen times more susceptible than females. In case of western countries, the prevalence rate of duodenal and gastric ulcer is equal, but in the tropical areas it is 4:1.⁸ In the Holy month of Ramadan, the incidence of peptic ulcer disease increases.⁹ The main sites of the peptic ulcer disease include oesophagus, stomach, duodenum and Meckle's diverticulum (which contains the ectopic mucosa causing increased production of the acid).¹⁰ So far main causes of the PUD include *H. pylori*, use of NSAIDs, gastrenoma, cigarette smoking and stress¹¹. In the usual relationships,

INTRODUCTION

Peptic ulcer is a sore in the protective lining of the gastrointestinal tract characterized by epigastric pain, pain in right hypochondrium whose intensity usually increases while taking food. The pain is, sometimes, relieved by food and milk. There is itching between xiphoid

and umbilicus, nausea, vomiting, weight loss, heart burn and hematemesis.¹⁻³ Peptic ulcer may be due to an increase in acid secretion or a decrease in mucosal defence or both.³ It occurs in lower oesophagus, stomach and duodenum or in jejunum after surgical anastomosis with stomach.⁴ Up to the middle of

32% of the peptic ulcer incidents were attributed to smoking¹². *H. pylori* is regarded as to have 70% role in the development of the peptic ulcer. No study has previously been conducted in our set up to assess the association between peptic ulcer and major risk factors and their impact on the incidence of peptic ulcer. The aim of the study was to find out association between peptic ulcer (PU) and high risk predictors like sex, smoking, use of non-steroidal anti-inflammatory drugs (NSAIDs) and *H. pylori* infection.

METHODOLOGY

This descriptive hospital based study was conducted at the medical unit of the Tertiary Care Hospital, Saidu Sharif Swat, over a period of 4 months from October 2011 to January 2012. Seventy two patients of age above 16 years with the established diagnosis of peptic ulcer based on upper gastrointestinal (UGI) endoscopy, having risk factors like previous history of smoking (at least 6 months smoking history and with average of 18 cigarettes/day), ingestion of NSAIDs and presence of *H. pylori* infection were included in study. All those patients of peptic ulcers having no risk factors or presence of risk factors other than risk factors mentioned were excluded from study. All the patients were collected by purposive sampling technique.

After taking informed consent, a detailed history was taken and general and physical examination were carried out in patients who were admitted in medical ward with signs and symptoms suggestive of peptic ulcer. History of previous medications especially use of NSAIDs, smoking habits, *H. pylori* infection (confirmed by urease test) were taken. Upper GI endoscopies were performed after having written consent and following standard protocol for UGI endoscopy. Only those with endoscopically proven peptic ulcer, were selected for the study. All the relevant data were collected on a structured proforma including patient's demographics, clinical presentation of disease, and associated major risk factors.

Seventy two cases fulfilling the criteria were recruited during the study period.

Data were evaluated, retrospectively, for the frequency of the disease, causes of hospitalization, percentage of duodenal and gastric ulcer along with the male to female ratio. Respective ward physicians diagnosed and treated the patients.

Statistical analysis

Statistical analysis of results was performed for various variables by using SPSS version 14. We used the standard (direct) logistic regression analysis, where all explanatory variables were entered, one by one, simultaneously. The

current work particularly focuses on the significance of aforesaid predictors, when a predictor is added or dropped from the model. To assess the model fit, we used the Akaike information criterion (AIC),¹³ while to check the explanatory power of the model, we used Negalkerke R² (1991).¹⁵

RESULTS

Out of 72 patients, 49 were male and 23 were females with male to female ratio was 2.13:1. The participants' ages were in range of 10-80 years. Peptic ulcer was observed to be most prevalent in age of 21-40 years having major predictors (table I). Fifty eight (80%) of endoscopically diagnosed cases had duodenal ulcer (42 males versus 14 females) while 14 (20%) had gastric ulcer (7 males versus 7 females). Majority (68%) of the patients used NSAIDs for general body aches on long term basis. (Figure 1). The most common presentation of peptic ulcer was observed to be pain epigastrium (85%) followed by dyspepsia (60%), vomiting (50%) pallor (30%), and anorexia (20%). Smoking has a high incidence of 52.63%, and the use of NSAIDs shared 31.03% in patients of age 31-40 years. *H. pylori* infection was having 30% and 32% incidence in patients of groups 31-40 and 41-50 years, respectively. The rest of incidence of predictors in various age groups is shown in Table I. An outline of standard model statistics for various predictors of peptic ulcer like age, sex, smoking, use of NSAIDs and infection of

TABLE I : AGE DISTRIBUTION OF OBSERVED CASES OF PEPTIC ULCER WITH PREDICTORS

Age (years)	Numbers of patients (%) n=72	Smokers (%) n=18	Users of NSAIDs\$ (%) n=29	H. Pylori (%) n=51
10-20	06 (8.3)	2 (10.52)	2 (6.89)	4 (8)
21-30	18 (25)	3 (15.78)	7 (24.13)	9 (18)
31-40	20 (27.77)	10 (52.63)	9 (31.03)	15 (30)
41-50	09 (12.5)	1 (5.26)	4 (13.79)	16 (32)
51-60	09 (12.5)	2 (10.52)	2 (6.89)	3 (6)
61-70	08 (11.11)	0 (0)	5 (17.24)	4 (8)
71-80	02 (2.77)	0 (0)	0 (0)	0 (0)

\$ NSAIDs: Non-steroidal anti-inflammatory drugs

TABLE II: RESULTS OF FITTING THE BINARY LOGISTIC REGRESSION MODEL FOR VARIOUS SETS OF PREDICTORS UNDER STUDY

Parameters	K	LL	AIC	Nag. R2 (%)
Age	2	-38.826	81.652	2.18
Age+ Smoking	3	-31.642	69.284	29.00
Age+ Smoking+ Sex	4	-30.102	68.204	34.08
Age+ Smoking+ Sex+ NSAIDs	5	-27.731	65.462	41.50
Smoking+ Sex+ NSAIDs	4	-27.776	63.552	41.36
Smoking+ Sex+ NSAIDs +H. pylori	5	-25.483	60.966	48.09
Smoking+ NSAIDs	3	-28.937	63.874	37.79

Key: K= Parameter in the model; LL= Log-likelihood; AIC=Akaike information criterion; Neg= Nagelkerke; NSAIDs: Non-steroidal anti-inflammatory drugs

TABLE III: FITTED PARAMETER ESTIMATES FOR THE MATCH MINIMUM AIC LOGISTIC REGRESSION MODEL WITH PREDICTORS

Variable(s)	Coefficient	St. Error	P-value
Constant	-3.82915	1.29740	0.003
Smoking	1.73123	0.767919	0.024**
Sex	1.23706	0.748194	0.098*
NSAIDs [§]	2.21301	0.977103	0.024**
H. pylori	1.70847	0.808303	0.035**

**p > 0.05 and *p > 0.10 §: Non-steroidal Anti-inflammatory Drugs

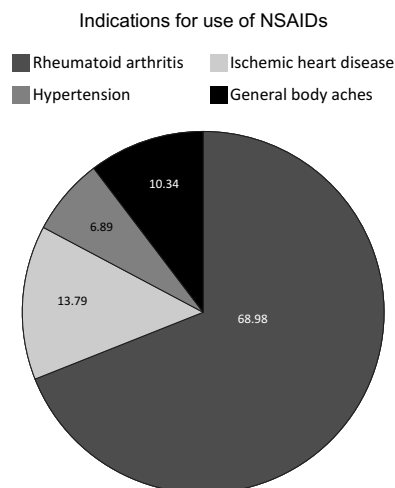


Figure I: Main Indications for use of NSAIDs in patients suffering from Peptic Ulcer

the stomach involving *H. pylori* is shown in Table II. Smoking, sex, use of NSAIDs and *H. pylori* were found to be statistically significant factors, their explanatory power of difference says that smoking has a predominant role as it has greater Nagelkerke R^2 score (27%). Similarly,

Nagelkerke R^2 score for use of NSAIDs is 7% (41.5-34.08), involvement of *H. pylori* 6% (48.09-41.36) and 5% for sex. In order to find out the probability of getting ulcer from different factors, its coefficients are given in Table III.

DISCUSSION

Peptic ulcer disease is highly associated with *H. pylori* in southern Europe though some cases of peptic ulcers are not associated with *H. pylori* and the use of NSAIDs.¹⁶ Peptic ulcer was observed to be more prevalent in the age of 21-30 years and 31-40 years in our study in the smokers and those who use NSAIDs for the treatment of rheumatoid arthritis, treatment of ischemic heart disease, hypertension and general body aches. However, *H. pylori* infection was found to be more prevalent in the age of 21-50 years. Hence, eradication of *H. pylori* can be considered in patients of age 21-50 years before the initiation of NSAIDs therapy as concomitant use in *H. pylori*

infection can aggravate the situation.¹⁷ On the other hand very strong associations have been reported for concomitant use of NSAIDs and *H. pylori* infection suggesting that *H. pylori* eradication regimen may be initiated prior to use of NSAIDs¹⁸. Nevertheless, our observations showed strong association of getting chance of ulcers in smokers. While taking into account the different parameters (sex, use of NSAIDs, smoking and *H. pylori*), it is evident that smoking + NSAIDs + Sex + *H. pylori* have high explanatory power for peptic ulcers. Thus the ordinal comparisons for different factors are: smoking > NSAIDs > *H. pylori* > Sex. Moreover, peptic ulcer is predominant in men 68.05% than women (31.94%). Our findings for the use of NSAIDs were nearly resembling the findings of Hamid et al (2006)¹⁷ which say that NSAIDs and *H. pylori* are regarded as the independent risk factors for development of peptic ulcer. However, we found highly significant association of smoking with peptic

ulcer which may be attributed to the pharmacological action of nicotine and other constituents present in cigarettes. Hence, awareness about giving up smoking is very important and shall be kept on priority basis for combating peptic ulcer.

CONCLUSION

Smoking has strong association for development of peptic ulcer than NSAIDs. However, associations for getting chance of peptic ulcer become more prevalent whence the use of NSAIDs, *H. pylori* infection and smoking is taken into account together. Smoking should be strongly discouraged and patients' with peptic ulcer be warned of its hazardous effects. Moreover, physicians may take into account smoking as major inferential associated factor together for better understanding.

Acknowledgements

The authors acknowledge the support of administration of Saidu Group of Teaching Hospitals, Saidu Sharif Swat, for providing the opportunity to interneers.

REFERENCES

1. Nawaz M, Jehanzaib M, Khan K, Zari M: Role of barium meal examination in diagnosis of peptic ulcer. *J Ayub Med Coll Abbotabad* 2008; 20(4): 59-61.
2. Henderson RP, Lander RD: Peptic Ulcer Disease. In: Eric T Herfindal, Dick R Gourley (Ed). *Textbook of Therapeutics*, 17th edition. United States of America, Lippincott Williams and Wilkins, 2000; pp 515-530.
3. Gregory MC, Tolman KG: Diseases: Manifestation and Pathophysiology. In: Alfoso R Gennaro (Ed). *The Science and Practice of Pharmacy*, 20th edition. United States of America, Lippincott Williams and Wilkins, 2000; pp 1053-1097.
4. Palmer KR, Penman ID: Diseases of alimentary tract and pancreas. In: Cristoper Haslett, Edwin R Chilvers, John AA Hunter, Nicholas A Boon (Ed). *Principle and Practice of Medicine*, 18th edition. Edinburgh, Harcourt Publishers, 2000; pp 599-680.
5. Yeomans ND: Management of peptic ulcer disease not related to *Helicobacter*. *J Gastroenterol Hepatol* 2002; 17: 488-94.
6. Holman G, Hoyden C W: Management of peptic ulcer bleeding – the roles of proton pump inhibitors *pylori* eradication. *Aliment Pharmacol Ther* 2004; 19 (1): 66-70.
7. Newton EB, Versants MR, Sepe TE: Giant duodenal ulcer. *World J Gastroenterol* 2008; 14(32): 4995-99.
8. Sharma MP, Ahuja V: Current Management of Acid peptic Disorder. *J Indian Acad Clin Med* 2003; 4(3): 228-33.
9. Zia N, Farooq U, Alta H, Hanif M, Malik N, Khan MM: Perforated duodenal ulcer; Frequency during the holy month of Ramadan. *Prof Med J* 2004; 11(4): 474-9.
10. Danish M I: *Textbook of Medical diagnosis and management*. 6th Edition, Paramount Publisher Karachi 2005; (8): 170.
11. Kim YH, Lee JH, Lee SS, Cho EY, Oh YL, Son HJ, et al: Long term stress and *helicobacter pylori* infection independently induce gastric mucosal lesions in C57BL/mice.scand. *J Gastroenterol* 2002; 37(11): 1259-64.
12. Hozawa A, Houston T, Steffes MW, Widome R, Williams OD, Iribarren C, et al. The association of cigarette smoking with self-reported disease before middle age: The Coronary Artery Risk Development in Young Adults (CARDIA) study. *Prev Med* 2006; 42(3): 193-9.
13. Tabachnick BG, Fidell LS: *Using Multivariate Statistics*, 4th Edition Pearson Education; 2001; pp. 65-68.
14. Sakamoto Y, Ishiguro M: *Kitigawa Akiage information criterion (AIC) statistics*. KTK publishing House Tokyo, 1986.
15. Negelkerke: A note on a general definitions of the coefficient of determination. *Biometrika* 1991; 78 (3): 691-2.
16. Arroyo MT, Forne M, de Argila CM, Feu F, Arenas J, de la Vega J, et al. The Prevalence of Peptic Ulcer not Related to *Helicobacter pylori* or Non-Steroidal Anti-Inflammatory Drug Use is Negligible in Southern Europe. *Helicobacter* 2004; 9(3): 249-354.
17. Vu C, Ng YY. Prevalence of *Helicobacter pylori* in Peptic Ulcer Disease in a Singapore Hospital. *Singapore Med J* 2006; 4(10): 478-81.
18. Hamid S, Yakoob J, Jafri W, Islam S, Abid S, Islam M: Frequency of NSAIDs Induced Peptic Ulcer Disease. *J Pak Med Assoc* 2006; 56(5): 218-22.

AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

- NA:** Conception & design; analysis & drafting of the manuscript; final approval of the version to be published
- AU:** Acquisition of data; drafting of the manuscript; final approval of the version to be published
- SA & SWAS:** Analysis and interpretation of data; final approval of the version to be published
- MJ:** Drafting of the manuscript; Critical revision & final approval of the version to be published

CONFLICT OF INTEREST

Author declares no conflict of interest

GRANT SUPPORT AND FINANCIAL DISCLOSURE

NIL

KMUJ web address: www.kmu.j.kmu.edu.pk

Email address: kmu.j@kmu.edu.pk