

THE PREVALENCE OF ENDOSCOPIC ESOPHAGITIS IN DUODENAL ULCER PATIENTS AND SYMPTOMATIC CONTROLS

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Background: A large series of duodenal ulcer patients was examined in order to determine the prevalence rate of reflux esophagitis and compare it to that of a series of symptomatic controls, as well as to find out if complicated duodenal ulcer patients are at a higher risk of developing reflux esophagitis.

Patients and Methods: All consecutive patients attending the Endoscopy unit between January and December 1996 who were found to have duodenal ulcers were prospectively recruited for this study. Consecutive patients with upper abdominal symptoms but negative gastroscopy for duodenal ulcers were used as a control. Patients known to have reflux esophagitis, those on peptic ulcer treatment for more than a week, those with dysphagia as a presenting symptom or underlying upper gastrointestinal malignancy, and patients who had undergone previous ulcer surgery were excluded from the study. A hundred and forty-one patients were found to have duodenal ulcer (Group I), and one hundred and seventy-two served as a control (Group II). The two groups were matched for age, NSAID ingestion and smoking habit. However, Group I included significantly more patients with underlying co-morbid conditions and fewer females.

Results: The prevalence of reflux esophagitis was similar between both groups, 30.5% vs. 38.4%, $P=0.18$. Furthermore, bleeding duodenal ulcer patients (sub-group III) were compared to non-bleeding duodenal ulcer patients (sub-group IV). Although Group III included significantly more smokers, NSAID ingestion and co-morbid conditions, there was no significant difference in the prevalence rate of reflux esophagitis, $P=0.13$. Moreover, 92.7% of afflicted patients suffer mild or moderate esophagitis.

Conclusion: Endoscopic esophagitis is a frequent finding in both duodenal ulcer and control subjects. *Ann Saudi Med 1998;18(3):226-229.*

Key Words: Endoscopic esophagitis, duodenal ulcer.

The prevalence of duodenal ulcer in the Western population is approximately 2%.¹ No similar population-based studies exist in Saudi Arabia. In the absence of ulcerogenic drugs, *H. pylori* is the most important factor in the pathogenesis of peptic ulcer disease.²

Successful eradication of *H. pylori* results in healing of duodenal ulcer and prevents ulcer recurrence.²⁻⁶ Acid-suppressing agents heal the majority of duodenal ulcers within eight weeks of treatment, however, the one-year recurrence rate is over 50%.^{7,8} Similarly, no epidemiological study is available on the prevalence of gastroesophageal reflux disease (GERD) in Saudi Arabia.

Duodenal ulcer may be frequently associated with reflux esophagitis,⁹⁻¹¹ although the published literature reveals different prevalence rates of this association. While Lorusso et al.⁹ reported that 12.3% of duodenal ulcer patients had reflux esophagitis, Flook and Stoddard¹¹

found that 18% of duodenal ulcers resulted from reflux esophagitis. Recently, Boyd¹² found that 33% of his duodenal ulcer patients had associated reflux esophagitis. A study by Behar et al.,¹³ however, found that none of the 14 duodenal ulcer patients had reflux esophagitis.

The purpose of this prospective study was to determine the prevalence rate of reflux esophagitis in a large series of duodenal ulcer patients and compare it to that of symptomatic controls, and also to find out if complicated duodenal ulcer patients are at a higher risk of developing reflux esophagitis.

Patients and Methods

All consecutive patients referred to the Endoscopy unit for upper gastroscopy between January 1996 and December 1996 and found to have active duodenal ulcers were included for initial assessment. Patients' main complaints were upper abdominal pain, heartburn, vomiting or a recent history of melena or hematemesis in the week before endoscopy.

Exclusion criteria included patients known to have gastro-esophageal reflux, patients on ulcer treatment for

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TABLE 1. Demographic data of duodenal ulcer and control groups.

	D/U (n=141)	Control (n=172)	P-value
Age (SD) in years	46.24 (17.6)	43.72 (14.5)	0.1
Male/Female	99/42	80/92	<0.001
NSAID ingestion (%)	13 (9.2)	17 (9.9)	0.99
Smokers (%)	24 (17)	30 (17.4)	0.96
Co-morbid conditions (%)	28 (19.9)	12 (7)	0.001
Reflux esophagitis (%)	43 (30.5)	66 (38.4)	0.18

more than one week, and patients with dysphagia, previous ulcer surgery and underlying upper gastrointestinal malignancy. The control group consisted of symptomatic subjects referred with similar symptoms during the same period, but with negative gastroscopy results for duodenal ulcer. All patients underwent gastroscopy, and the esophagus was inspected for GERD, which was graded according to Savary-Miller classification.¹⁴ Briefly, the endoscopic findings were divided into four stages: 1) one or more non-confluent mucosal lesion accompanied by erythema; 2) confluent erosive exudative lesions not covering the entire circumference; 3) erosive and exudative lesions covering the entire circumference; and 4) chronic mucosal lesions, such as ulcer or stricture.

Active duodenal ulcer is defined as the presence of ulcer crater in the duodenum. Patients with gastric ulcer or erosions, and duodenal erosions were also excluded. Patients with non-erosive gastroduodenitis were included in the control group. Patients with duodenal ulcer (Group I) were compared to those without duodenal ulcer (Group II) regarding age, sex, history of smoking, non-steroidal anti-inflammatory drug (NSAID) consumption, prevalence of endoscopic reflux esophagitis and presence of co-morbid condition.

Group I was further divided into two subgroups, and those with bleeding duodenal ulcer (sub-group III) were compared to duodenal ulcer not complicated by bleeding (sub-group IV) regarding the same variables.

Student's *t*-test, chi-squared and Fisher's exact tests were used for statistical analysis. *P*-value less than 0.05 was considered significant.

Results

This prospective study of unselected consecutive patients seen over one year included 313 patients. Upper gastrointestinal endoscopy (UGIE) revealed duodenal ulcer in 141 patients (Group I), while in the remaining 172 patients, UGIE was negative for duodenal ulcer (Group II). Table 1 compares the two groups regarding age, gender, NSAID ingestion, smoking habit, co-morbid conditions and the prevalence of gastroesophageal reflux disease (GERD). There was no significant difference between the two groups regarding these factors, however, Group I patients had significantly more underlying medical

TABLE 2. Characteristics of duodenal ulcer subgroups.

	Non-bleeder (n=109)	Bleeder (n=32)	P-value
Age (SD) in years	45.36 (17.9)	49.28 (16.64)	0.13
Male/Female	74/35	25/7	0.37
NSAID ingestion (%)	6 (5.5)	7 (21.9)	0.01
Smokers (%)	9 (8.3)	15 (46.9)	<0.001
Co-morbid conditions (%)	16 (14.7)	12 (37.5)	0.009
Reflux esophagitis (%)	35 (32)	8 (25)	0.13

TABLE 3. Macroscopic esophagitis in duodenal ulcer and control groups.

Esophagitis grade	0	I	II	III
Control (n=172)	106	48	15	3
Duodenal ulcer (n=141)	98	15	23	5
<i>P</i> -value		0.0002	0.002	0.3

illnesses ($P=0.001$), while the control group included significantly more females ($P<0.001$).

Table 2 compares uncomplicated duodenal ulcer patients (n=109) and those with bleeding duodenal ulcer (n=32). Although the bleeders had significantly more patients with a smoking habit, underlying medical diseases and use of NSAID ($P= <0.001$, 0.009, and 0.01, respectively), no significant difference in GERD prevalence was found among the two groups.

Distribution of macroscopic esophagitis in controls and patients with duodenal ulcer is shown in Table 3. The control group had significantly more patients with stage 1 GERD ($P<0.001$), while significantly more duodenal ulcer patients had stage 2 GERD ($P=0.002$). On the other hand, no significant difference in the prevalence of GERD was noted among patients with bleeding and non-bleeding duodenal ulcers (Table 4). There was also no significant difference in trend in the degree of reflux esophagitis among cases of duodenal ulcer, controls, complicated and uncomplicated duodenal ulcer subgroups, considering grade 0 as a reference baseline using chi-squared for linear trend ($X^2=0.13$, $P=0.71$ and $X^2=1.18$, $P=0.27$, respectively). Moreover, 92.7% of afflicted patients suffer mild or moderate esophagitis.

Discussion

H. pylori is the most important factor in the pathogenesis of duodenal ulcer in the absence of ulcerogenic drugs.² Successful eradication of *H. pylori* heals the ulcer and prevents ulcer recurrence and complications.^{2,6,15-19}

GERD is multifactorial in etiology. Transient relaxation of lower esophageal sphincter (TRLES) is the most important determinant of reflux.²⁰ This is influenced by meals and the fat content of food.^{21,22} Competence of

TABLE 4. *Macroscopic esophagitis in duodenal ulcer subgroups.*

Grade	0	I	II	III
Uncomplicated duodenal ulcer (n=109)	74	14	18	3
Bleeding duodenal ulcer (n=32)	24	1	5	2
P-value		0.3	0.8	0.5

gastroesophageal sphincter is maintained by sphincter muscle as well as the crura of the diaphragm.²³ The effect of TRLES is more pronounced in the presence of hiatal hernia, which delays clearance of refluxate.^{24,25} Once reflux has occurred, several mechanisms determine the outcome, namely: 1) contact time between refluxate and esophageal mucosa; 2) the potency of refluxed fluid; 3) intrinsic resistance of esophageal lining; 4) the efficacy of esophageal peristalsis to clear down the refluxate; and 5) the neutralizing effect of salivary secretion.²⁶

The prevalence rate of endoscopic esophagitis in this large and unselected group of patients is similar among duodenal ulcer and control groups (30.5% vs. 38.4%) ($P=0.18$), respectively. Moreover, the prevalence rate was not statistically different between uncomplicated duodenal ulcer and bleeding duodenal ulcer group (32% vs. 25%) ($P=0.13$). This could be explained at least partially by the difference in the underlying pathogenesis of duodenal ulcer and GERD, as mentioned above. The evidence was shown in Table 2, where the bleeding duodenal ulcer group had significantly more NSAID ingestion, smokers and comorbid conditions ($P=0.01$, <0.001 , and 0.009 , respectively), but with no significant difference in GERD between the two ulcer groups.

Our findings are in agreement with those of a recent study which reported the prevalence rate of endoscopic esophagitis in duodenal ulcer patients and ulcer-like dyspepsia to be 33% and 35%, respectively.¹² The lower prevalence rate of GERD reported by other authors (0-18%) may reflect a sample selection bias and prior medical treatment before subjecting their patients to surgery.^{9-11,13}

This study also demonstrated that Savary-Miller grade I and II GERD are by far more prevalent in our population, as was noted by other authors.^{12,27}

Recognition of GERD in patients requiring surgical management of ulcer disease is important, as additional anti-reflux procedures may be considered. While Lorusso et al.⁹ reported improvement of associated reflux esophagitis in the majority of patients who underwent Billroth II gastric resection—the indications for surgery in his group of patients were failure of medical therapy or presence of pyloric stenosis—Pezzolla et al.¹⁰ recommended additional antireflux procedures if abnormalities of lower esophageal sphincter are suspected to play a major role in the pathogenesis of associated reflux esophagitis and in the absence of pyloric stenosis. Furthermore, Flook and Stoddard recommended that

careful preoperative assessment of associated esophageal disease is necessary to decide on which duodenal ulcer patients will require additional antireflux surgery.¹¹

In conclusion, endoscopic reflux esophagitis is frequently associated with duodenal ulcer patients and symptomatic controls. Furthermore, the prevalence rate is similar in these groups irrespective of whether the duodenal ulcer was complicated by bleeding or not. Further addition of ambulatory 24 pH monitoring would detect cases of GERD and normal endoscopy. Mild to moderate reflux esophagitis is by far the most common endoscopic finding encountered. Careful search for reflux esophagitis is necessary in patients requiring ulcer surgery.

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References

1. Kurata JH. Epidemiology of peptic ulcer disease. In: Swabb EA, Szabo S, editors. Ulcer disease: investigation and basis for therapy. New York: Marcel Dekker Inc., 1991:31.
2. Lebenz J, Tillenburg B, Peitz U, Borsch G. Long-term consequences of *Helicobacter pylori* eradication: clinical aspects. Scand J Gastroenterol 1996;31(Suppl 215):111-5.
3. Coghlan JG, Gilligan D, Humphreys H, McKenna D, Dooley C, Sweeney E, et al. *Campylobacter pylori* and recurrence of duodenal ulcer: a 12-month follow-up study. Lancet 1987;2:1109-11.
4. Tytgat GNJ. Treatments that impact favourably upon the eradication of *Helicobacter pylori* and ulcer recurrence (review article). Aliment Pharmacol Ther 1994;8:359-68.
5. Adamek RJ, Wegner M, Labenz J, Freitag M, Opferkuch W, Ruhl GH. Medium-term results of oral and intravenous omeprazole/amoxicillin *Helicobacter pylori* eradication therapy. Am J Gastroenterol 1994;89:39-42.
6. Jaspersen D, Koerner T, Schorr W, Brennenstuhl M, Raschka C, Hammer C-H. *Helicobacter pylori* eradication reduces the rate of rebleeding in ulcer hemorrhage. Gastrointest Endosc 1995;41:5-7.
7. Euler AR, Wood DR, Sykes RS. A 4-week, multicenter, duodenal ulcer healing trial comparing four escalating doses of ranitidine. Am J Gastroenterol 1993;88:222-6.
8. Susi D, Neri M, Ballone E, Messetti A, Cucurullo F. Five-year maintenance treatment with ranitidine: effects on the natural history of duodenal ulcer disease. Am J Gastroenterol 1994;89:26-32.
9. Lorusso D, Pezzolla F, Guerra V, Giorgio I. Effect of gastric resection by Billroth II technique on reflux esophagitis associated with duodenal or pyloric ulcer. Minerva-Chir 1995;50:493-6.
10. Pezzolla F, Lorusso D, Guerra V, Giorgio I. Surgical management of reflux esophagitis associated with duodenal ulcer. G Chir 1995;16:93-6.
11. Flook D, Stoddard CJ. Gastro-oesophageal reflux and esophagitis before and after vagotomy for duodenal ulcer. Br J Surg 1985;72:804-7.
12. Boyd EJS. The prevalence of esophagitis in patients with duodenal ulcer or ulcer-like dyspepsia. Am J Gastroenterol 1996;91:1539-43.
13. Behar J, Biancani P, Shehan DG. Evaluation of esophageal tests in the diagnosis of reflux esophagitis. Gastroenterology 1976;71:9-15.
14. Savary M, Miller G. The esophagus. In: Handbook and atlas of endoscopy. Switzerland: Gassman, Solothurn, 1978:135-9.
15. Labenz J, Borsch G. Evidence for the essential role of *Helicobacter pylori* in gastric ulcer disease. Gut 1994;35:19-22.

16. Bianchi Porro G, Parente F, Lazzaroni M. Short and long-term outcome of *Helicobacter pylori* positive resistant duodenal ulcer treated with colloidal bismuth subcitrate plus antibiotics or sucralfate alone. *Gut* 1993;34:466-9.
17. Hosking SW, Ling TKW, Chung SCS, Yung MY, Cheng AFB. Duodenal ulcer healing by eradication of *Helicobacter pylori* without anti-acid treatment: randomised controlled trial. *Lancet* 1994;343:508-10.
18. Henriksson AE, Edman AC, Held M, Wadstrom T. *Helicobacter pylori* and acute bleeding peptic ulcer. *Eur J Gastroenterol Hepatol* 1995;7:769-71.
19. McColl KEL. The role of *helicobacter pylori* eradication in the management of acute bleeding peptic ulcer. *Eur J Gastroenterol Hepatol* 1995;7:753-5.
20. Dodds WJ, Dent J, Hogan WJ, et al. Mechanisms of gastroesophageal reflux in patients with reflux esophagitis. *N Engl J Med* 1982;307:1547-52.
21. Holloway RH, Kocyan P, Dent J. Provocation of transient lower esophageal sphincter relaxations by meals in patients with symptomatic gastroesophageal reflux. *Dig Dis Sci* 1991;36:1034-9.
22. Ireland A, Lyrenas E, Tippet M, Dent J, Holloway RH. Provocation of transient lower esophageal sphincter relaxations and gastroesophageal reflux by intraduodenal fat. *Gastroenterology* (abstract) 1990;98(Suppl):A361.
23. Mittal RK, Fisher M, McCallum RW, Rochester DF, Dent J, Sluss J. Human lower esophageal sphincter pressure response to increased intraabdominal pressure. *Am J Physiol* 1990;258:G624-G630.
24. Mittal RK, Lange RC, McCallum RW. Identification and mechanism of delayed esophageal acid clearance in subjects with hiatus hernia. *Gastroenterology* 1987;92:130-5.
25. Sloan S, Kahrilas PJ. Impairment of esophageal emptying with hiatal hernia. *Gastroenterology* 1991;100:596-605.
26. Pope II CE. Acid-reflux disorders. *N Engl J Med* 1994;331:656-60.
27. Wienbeck M, Barnert J. Epidemiology of reflux disease and reflux esophagitis. *Scand J Gastroenterol* 1989;24(Suppl 156):7.