



TO STUDY GASTROESOPHAGEAL REFLUX DISEASE (GERD) IN DIABETICS AND PATIENTS WITH NO UNDERLYING COMORBIDITIES USING UPPER GASTROINTESTINAL ENDOSCOPY (UGIE) AT A TERTIARY CARE CENTRE IN SITAPUR DISTRICT

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ABSTRACT **Background:** Patients with type 2 diabetes mellitus (DM) were known to have higher prevalence of gastroesophageal reflux disease (GERD). Pathophysiological changes observed in the diabetic patient include the effects of acute and long-term hyperglycemia on neuronal function and gastrointestinal motility. For that reason, diabetic patients commonly suffer from esophageal dysmotility and gastroparesis, which may contribute to the development of GERD. **Objective:** The present study was designed to study GERD in both diabetics and patients with no underlying comorbidities using Upper Gastrointestinal Endoscopy (UGIE). **Method:** A cross sectional prospective randomized study was carried out from January 2021 to July 2022. Data was collected from 390 patients on the basis of individual patient information obtained on the prescribed proforma. The diagnostic criteria for GERD included the upper gastro endoscopic view, which was analyzed using the scale of 'The Los Angeles Classification of Esophagus' from grades A to D. **Result:** The prevalence of DM in the current study was found to be 20.8%. Of 81 diabetic patients, 43 (53.1%) were given a diagnosis of GERD based on endoscopy. Patients with concurrent GERD had poorly controlled serum glucose level, were older male and were heavier. Interestingly, no difference in body mass index was observed. However, the habit of smoking, alcohol intake and hot-spicy food significantly affected GERD in diabetic patients. The main symptoms of the GERD in diabetic group were abdominal heaviness (82.4%) while in GERD without any comorbidity was dysphagia (55%) but none of the symptoms were significantly associated with diabetic patients with GERD or without GERD. **Conclusion:** In this study, the prevalence of GERD in diabetic patient was higher than that found in the population without any comorbidity suggests that GERD in diabetic patient could be due to a poorly controlled serum glucose level but to prove that more studies with larger sample size are needed.

KEYWORDS : Diabetes mellitus, Gastroesophageal reflux disease, UGIE, Prevalence, Risk Factor

INTRODUCTION

According to the World Health Organization (WHO), non communicable diseases (NCDs) reckoned for 74% of deaths globally in 2019, of which, diabetes resulted in 1.6 million deaths, thus becoming the 9th leading cause of death worldwide. Diabetes has steadily increased in India and around the world over the last three decades, with India accounting for a large portion of the global load.

DM patients suffer from many complications and experience gastrointestinal symptoms considerably more often. The pathophysiological changes determined in the diabetic patient include the effects of acute and long-term hyperglycemia on neuronal function and gastrointestinal motility. The pathogenesis of gastrointestinal manifestations in DM, which is usually due to neurological dysfunction of particularly autonomic neuropathy, was not specifically elucidated. GERD has an estimated high prevalence worldwide with a broad range of variability among different populations because of differences in the risk factors. GERD is the most ordinarily reported disorder of the upper part of the gastrointestinal tract (GIT) and it is defined as a condition, which develops when the acid reflux from the stomach occurs into the esophagus and causes troublesome symptoms. Heartburn and regurgitation are the most common symptoms of GERD. These symptoms can potentially affect the quality of life of patients. If left untreated, GERD may cause serious complications, morbidities, and economic burdens that may further necessitate lifestyle modifications, long-term management regimens, and surgical interventions. Moreover, Barrett's esophagus, esophageal stricture, and esophageal adenocarcinoma are the serious complications associated with GERD².

There have been contradictory results produced by studies assessing the relationship between DM and GERD. Some researchers suggested a correlation with either DM or metabolic syndrome and GERD although other research did not find any correlation to connect these disorders to each other. Several studies suggest^{3,4} that diabetic patients are not only more prone to developing GERD, but they may also present with atypical GERD manifestations. Thus, practitioner

treating these patients need to be cognizant of currently established relationships between these two diseases in order to best treat their patients. Diabetic and antireflux medications have known interactions and gastrointestinal adverse events, which adds to the challenge facing practitioner in the identification and treatment of GERD in the diabetic patient.

The present study was designed to study GERD in diabetics and patients with no underlying comorbidities using Upper Gastrointestinal Endoscopy (UGIE) at a tertiary care centre in Sitapur district.

MATERIAL & METHODS

A cross sectional prospective randomized study was carried out in Department of Medicine from January 2021 to July 2022 after the approval from the IHEC. Study included a total of 390 patients with upper GI symptoms and data was collected on the basis of individual patient information obtained on the prescribed proforma. Then a detailed history was taken from patients of diabetic or non diabetic having gastrointestinal symptoms and their family history as well including dietary habit, addiction history and lifestyle followed by through examination and haematological investigations and finally UGI endoscopy. The Chi-square test was used to compare categorical variables. The Unpaired t-test was used to compare continuous variables. The Data compilation and statistical analysis was carried out in the study on IBM SPSS 20.0

RESULTS

A total of 390 patients with upper GI symptoms were included in the study. Out of total 390 patients, 309 didn't had Diabetes while 81 had Diabetes Mellitus. Thus the prevalence of DM in the current study was found to be 20.8%. After UGIE a total of 187 patients were found to have GERD. Thus the prevalence of GERD in diabetic and non-diabetic patients was 53.1% and 46.6% respectively.

Sociodemographic characteristics of diabetic patients are shown in Table 1. Among 81 diabetics patients, 70% male had GERD while

only 25.8% female had GERD and male gender was found to be significantly associated with GERD. 66.7% of diabetic patients with age >50 years were having GERD while 100% of diabetic patients with age group 20-30 years were without GERD.

Of anthropometric assessment, average weight was higher in patients of GERD in diabetics and was significantly associated with GERD but interestingly BMI was not. Out of total 33 diabetic smokers, 69.7% had GERD while 30.3% were without GERD. Similarly out of 36 diabetics with habit of drinking, 83.3% had GERD while 16.7 were without GERD and both the habit of smoking and alcohol intake were significantly associated with GERD. Even non diabetics patients having habit of smoking and alcohol presented with higher prevalence of GERD.

Talking about dietary habits, hot & spicy food and dinner to bedside <3 hours habit were often seen with higher prevalence of GERD in diabetic patients but only hot and spicy food habit was found to be significantly associated with GERD while in non diabetics these habits were associated with lower prevalence of GERD.

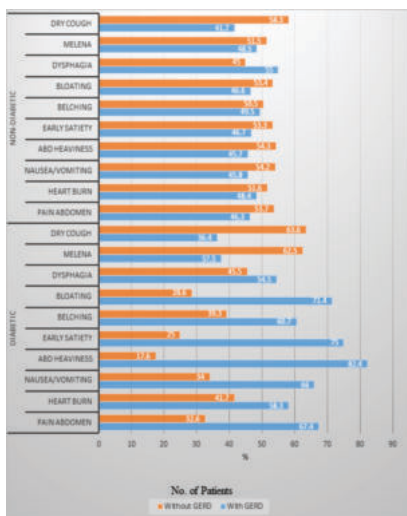
In case of diabetics, sedentary lifestyle had higher prevalence of GERD (57.6%) but association was not significant.

Table1: Showing socio-demographic characteristics of DM patients

FACTOR	DM WITH GERD	DM WITHOUT GERD	P-value
PATIENTS	53.1%	46.9%	---
FEMALE	25.8%	74.2%	0.001
MALE	70.0%	30.0%	
AGE(years mean±SD)	58.6 ± 9.2	58.5 ± 8.8	----
SMOKING HABIT	69.7%	30.3%	0.01
ALCHOHOLIC	83.3%	16.7%	0.001
HOT AND SPICY FOOD	50.7%	49.3%	0.001
DINNER TO BEDSIDE <3 HRS	57.6%	42.4%	0.42
SEDANTRY LIFESTYLE	57.6%	42.4%	0.13

Figure1 below shows the distribution of patients according to gastrointestinal complaints and its association with prevalence of GERD. Dysphagia was the most common gastrointestinal complaint (55%) among non diabetic patients and abdominal heaviness(82.4%) and early satiety(71.4%) were the most common Gastrointestinal complaints in diabetic patients but none of the symptoms were significantly associated with diabetic patients with GERD or without GERD.

Figure.1: Distribution of patients according to Gastrointestinal complain and its association with prevalence of GERD



On comparing Biochemical parameters between diabetic patients with and without GERD. All the biochemical parameters were significantly (p<0.01) higher among patients of diabetes with GERD than without GERD as seen in Table2.

Table2: Comparison of Biochemical parameters between with and without GERD

Biochemical parameters	DM With GERD	DM Without GERD	p-value
HbA1c	8.82±2.45	6.90±2.20	0.003*
FBS	166.88±47.84	118.16±48.27	0.0001*
PPBS	294.44±109.25	193.80±56.34	0.0001*

*significant

Esophagus- LAXED LES grade II was among half of patients of diabetes (50%) and in 37.9% of non-diabetic group. Esophagus-GERD grade A, B and C was among about one third of patients of diabetic patients (32.3%) and Grade II was in 43.3% patients of non-diabetic group.

DISCUSSION

Diabetes is a major pathological state, as it is an essential contributor to various other diseases and its incidence still continues to rise. Despite the fact that its role as a risk factor for GERD has been demonstrated and that GERD itself is of high clinical relevance, little light has been shed on the connection between the two diseases². We looked into prevalence of GERD in patients with DM in relation with gender, age, BMI, smoking status, habit of alcohol intake, dietary habit, lifestyle and certain biochemical parameters, and grading of GERD.

In accordance to the study of Sun et al.⁶ the current study reported GERD to be more prevalent (53.1%) in diabetic patients than in the general population(46.6%). DM has been described as a possible risk factor for the development of GERD. One USA study reported that the prevalence of GERD symptoms in type II DM patients was approximately 41%. Some studies on the Japanese or Korean indicated that the prevalence of GERD symptoms in patients with type II DM was approximately 18–25%^{7,8}.

However, 66.7% of diabetic patients with age >50 years were having GERD while 100% of diabetic patients with age group 20-30 years were without GERD and in non diabetics the prevalence of GERD was highest among patients of age >20-30 & 31-40 years (48.2%) and was lowest in <20 years (40%) but there was no significant (p>0.05) association of prevalence of GERD with age in both diabetic and non-diabetic patients. In a study of Altassan FM et al. it was found that Gastro-esophageal reflux disease patients were older (mean age: 55.27, p=0.038) than non-GERD among diabetic patients⁹.

In this study, more than half of patients of both diabetic (61.7%) and non-diabetic patients (57%) were males and male gender was found to be significantly associated with GERD in diabetic patients. On the contrary Suwita et al. study¹⁰ showed that female gender was associated with GERD vs non-GERD in DM patients (87% vs 68%, p = 0.048)

Higher BMI levels, as found in the T2D patients are an established risk factor for the development of GERD, and, thus, for esophagitis¹¹. In the current study though weight in diabetic patients was significantly associated with GERD but interestingly BMI was not. Contrary to the current study in some studies, it has been mentioned that obesity^{7, 11,12} may be the contributory factors for the presence of GERD symptom in DM patients.

In accordance to current study, P. Bytzer et al.¹³ showed that poor glycemic control was associated with GERD in diabetic patients and so forth suggests that GERD in diabetic patient could be due to a poorly controlled serum glucose level. However, some other studies reveal that this may not be the case^{5,10}.

Association between GERD and smoking among the no comorbidity population is controversial. One study reported no difference in the prevalence of GERD between smokers and non-smokers, whereas another study found that smoking is strongly associated with GERD¹⁴ like in the current study where smoking and also the habit of alcohol intake were found to be significantly associated with GERD in DM patient.

In a study by Suwita et al.¹⁰ dietary factors found to be associated with GERD patients were spicy diet (90%), high-fat food (90%), irritative beverages (87%), and irritative diet (23%). Similarly current study also showed that patients having hot and spicy food had higher

prevalence of GERD and was also significantly associated. The dinner to bed time interval was found to have a great impact on the GERD development as far as this study is concerned. In persons where this interval was <3 hours, the GERD was seen in only 57.6% but the association was not significant.

Physical activity as per current study has a very important role to play in the prevalence of GERD. Those who resorted to a sedentary life style were more prone to develop GERD than those who remained physically active which is in accordance to the study of Zheang Z et al.¹⁵

The chief complaints pertaining to gastrointestinal symptoms in both study groups were non-specific. The individual symptom load differs between diabetics and non-diabetics like other study¹⁶. In current study, abdominal heaviness and bloating were found more frequently in GERD patients with DM and dysphagia was the most frequent symptoms in non diabetics. 58.3% non diabetic patient with GERD while only 54.55% of diabetics with GERD complained of heart burn that's because the ability of DM patients to feel acid regurgitation might be decreased¹⁷.

CONCLUSION

In this study, the prevalence of GERD in diabetic and non-diabetic patients was 53.1% and 46.6% respectively. The prevalence of GERD in diabetic patient was higher than that found in the population without any comorbidity suggests that GERD in diabetic patient could be due to a poorly controlled serum glucose level. Diabetic patients with GERD and without GERD were more often male and older >50 years. Of the other tested factors (gender, weight, smoking and alcohol intake habit, hot-spicy food and lifestyle) showed significant difference between GERD and non-GERD groups. It is essential to raise awareness about the high prevalence of symptomatic GERD in diabetic patients as a consequence of their DM to enable doctors to proactively recognize, evaluate, and treat patients with these symptoms.

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