

Prevalence and risk factors of gastroesophageal reflux disease at a tertiary care center of Central India

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Abstract

Background: Gastro-esophageal reflux disease (GERD) is found to affect all age groups. Several lifestyle and factors related to personal habit are recognized as risk factors for the development of GERD. Understanding the current trend and association with the related risk factors will help the physicians to halt the progression of GERD. **Aims and Objective:** To evaluate the prevalence of GERD and its association with the different risk factors. **Materials and Methods:** A total 234 subjects accompanying the patients coming to Outpatients Department of Medicine of Gandhi Medical College and associated Hamidia Hospital at Bhopal were studied prospectively. An interview was performed by a trained interviewer to complete a pre-approved questionnaire containing questions related to demographic parameters, lifestyle, and GERD for each subject. Presence of GERD was confirmed if the subject reported heart burn and/or acid regurgitation in the preceding year with a frequency of at least one time per week, irrespective of its severity or duration. **Results:** GERD prevalence in present study was 33.76%. GERD was more common in females (34.50%) but difference was insignificant ($p=0.128$). Higher prevalence was observed in those with age more than 40 years ($p=0.032$). Obesity (mainly central) was significantly associated with GERD prevalence (0.023). GERD was more prevalent in patients with a history of headache taking NSAIDs ($p<0.001$) and having history of other GI complains ($p<0.001$). There was a higher prevalence of reflux in subjects having fried food ($P=0.001$) and in those consuming fruits less than once per day ($P < 0.001$). Smokers had more GERD symptoms ($P < 0.001$). Subjects with history taking yogurt with water and mixed with salt with meals had less reflux symptoms ($P=0.001$, $P=0.033$, respectively). History of drinking tea or coffee ($P = 0.334$) with meals was not associated with GERD symptoms. We also noticed more symptoms in subjects taking NSAIDs and aspirin, but the difference was significant only for NSAID ($P < 0.001$). **Conclusion:** Prevalence of GERD was found to be 33.76%. Older age, consumption of fruits, smoking and NSAIDs had a significant association with GERD prevalence.

Keywords: heart burn, demographic risk factors, old age, reflux disease, GERD

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Introduction

Symptoms associated with the occurrence of gastroesophageal reflux disease (GERD) characterized as one of the serious health problems globally. GERD is also getting more prevalent in Indian population [1]. GERD is a chronic disease which occurs due to the interaction between refluxed gastric content with the esophageal mucosa. Most prominent symptoms are heartburn which significantly affect the quality of life of the person [2]. Previous studies have shown environmental factors as the main culprit for the GERD [3]. Several parameters have been found to be associated with the occurrence of GERD related symptoms including weight, alcohol consumption, smoking and intake of non-steroidal anti-inflammatory drugs and sleeping position (right side) [4].

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Understanding the prevalence and the factors/parameters associated with the occurrence of the GERD can assist in preventing the occurrence and treatment of GERD. Hence in present study we tried to evaluate the prevalence of GERD and the associated factors responsible for occurrence of the GERD [5-7].

Materials and Methods

Present prospective study was performed on 234 subjects who came along with the patients in Outpatients Department of Medicine of Hamidia Hospital after taking a written informed consent from each participant. We performed a multiple stage stratified cluster random sampling method to divide 234 subjects having age 20 years or more of either sex. An interview was performed by a trained interviewer to complete a pre-approved questionnaire containing questions related to demographic parameters, lifestyle, and GERD for each subject. GERD was diagnosed by having 2 well defined GERD symptoms; heartburn which was defined as a burning feeling in epigastrium rises through the chest in substernal area and regurgitation which was defined if liquid coming back into the mouth leaving a bitter or sour taste. Presence of GERD was confirmed if the subject reported

heart burn and/or acid regurgitation in the preceding year with a frequency of at least one time per week, irrespective of its severity or duration. We also recorded details such as age, gender, marital status, BMI [weight in kilogram in fasting state divided by square of height in meters, and further divided in to 3 categories of normal weight (< 24.9 Kg/m²), over-weight (25-29.9 Kg/m²) and obese (> 30 Kg/m²), dietary habits, smoking (cigarette or Bidi), coffee and tea consumption and use of aspirin, non-steroidal anti-inflammatory drugs (NSAIDs) and acetaminophen. All the data was analyzed

using IBM SPSS ver. 20 software. All the data was expressed as numbers. Chi Square test was used to compare the association between different parameters and prevalence of GERD. P value of <0.05 was considered as significant.

Results

Out of total 234 patients enrolled; majority were female [142 (60.68%)] followed by male [92 (39.32%)]. The prevalence of GERD in present study was 33.76%.

Table 1: Prevalence of GERD according to different demographic profile and lifestyle parameters

Parameters		GERD		Total	P value
		Present	Absent		
Sex	Male	30	62	92	0.128
	Female	49	93	142	
Age (years)	≥40	52	79	131	0.032
	<40	27	76	103	
Marital status	Married	47	88	135	0.241
	Single	32	67	99	
BMI (kg/m ²)	Obese	20	11	31	0.023
	Overweight	10	9	19	
	Normal	49	135	184	
History of headache taking NSAIDs	Yes	52	72	124	<0.001
	No	27	83	110	
History of other GI complains	Yes	58	62	120	<0.001
	No	21	93	114	

GERD; gastro oesophageal reflux disease, GI; gastrointestinal

We observed no significant difference among gender regarding the prevalence of GERD (p=0.128), however prevalence of GERD was significantly higher among those with age more than 40 years as compared to those with age <40 years (p=0.032). Marital status was not found to have any association with the GERD as the

prevalence was similar in both married and single person (p=0.241). GERD was more prevalent in obese patients with p value of 0.023. GERD was more prevalent in patients with a history of headache taking NSAIDs (p<0.001) and having history of other GI complains (p<0.001).

Table 2: Showing association of diet, smoking, and drinking habits and medication with GERD prevalence

Parameters		GERD		Total	P value
		Present	Absent		
History of fried food 3 times/week	Yes	62	108	170	0.001
	No	17	47	64	
Fruits	≥1/ daily	52	97	149	<0.001
	<1/ daily	27	58	85	
Smoking	Yes	48	56	104	<0.001
	No	31	99	130	
Tea and coffee	Yes	65	134	199	0.334
	No	14	21	35	
Beverages (Aerated)	Yes	58	122	180	0.001
	No	21	33	54	
Beverages (Non-aerated)	Yes	58	122	180	0.221
	No	21	33	54	
Yogurt drinks (mixed with salt)	Yes	62	91	153	0.033
	No	17	64	81	
NSAIDs/ Aspirin	Yes	56	87	143	<0.001
	No	23	68	91	

While assessing the dietary, personal habits and medication history, it was revealed that there was a higher prevalence of reflux in subjects having fried food at least 3 times per week (P=0.001) and in those consuming fruits less than once per day (P < 0.001). We also found a significant association between GERD prevalence and the personal habits of the person. Those who had history of cigarette and Bidi smoking, GERD was found to be more prevalent as compared to non-smokers (P < 0.001). The prevalence of GERD was not statistically significant in subjects with history of drinking tea and/or coffee (P = 0.334) with or between meals compared to those without such a history. On the other hand, subjects with history of taking yogurt with water and mixed with salt with meals had less reflux symptoms (P=0.033).

We also noticed more symptoms in subjects taking NSAIDs or aspirin (P < 0.001).

Discussion

In present study we found a significant association between the lifestyle related factors and prevalence of GERD. Prevalence of GERD which is defined as heartburn and/or acid regurgitation at least one time per week was revealed to be 33.76%. The prevalence found in present study is higher compared to most of the previous studies from the western world [7,8]. Goh et al in their review reported a prevalence of 20-40% for heartburn and 14% for the weekly heartburn [9]. Heartburn is one of the classical symptoms describing the occurrence of GERD. In a recent study by Arivan et al involving 674 undergraduate MBBS students reported that 30% of undergraduate students of a medical school in southern India had at least one episode of heartburn or regurgitation in a week, and 5% of students qualified for a diagnosis of GERD defined by a symptom score ≥ 4 [4]. Another previous study on GERD

symptoms from southern India, reported similar prevalence of weekly symptoms (24%) [5]. A study on employees of a government hospital in northern India found a prevalence of 16.2% [6]. The GERD prevalence was not different in males and females however prevalence increases with age (>40). In line with that a similar study from Olmsted county, Minnesota revealed no difference between gender and GERD [7]. However, few studies have demonstrated higher prevalence of GERD among female population [10-12]. In present study we also found that body mass index was a significant predictor of occurring GERD. In line with that Nocon et al showed a higher prevalence of reflux symptoms in obese subjects [14]. In present study, patients with history of headache had more prevalence of GERD as revealed by the highly significant P Value of <0.001. Previous studies have reported that subjects with GERD has other symptoms such as dyspepsia, abdominal pain, and distention/bloating. However, relation between these gastrointestinal symptoms and headache is left unnoticed. A previous study by Meucci et al demonstrated that prevalence of migraine headache did not differ from that in control individuals in patients having reflux-like and ulcer like dyspepsia whereas significantly higher prevalence was reported in patients with dysmotility-like dyspepsia [15]. Aamodt et al reported higher prevalence of headache in subjects having reflux, diarrhoea, constipation and nausea [16]. We also found that GERD symptoms also vary with food stuffs. In present study, it was revealed that subjects with history of consuming fried food had more reflux symptoms. Previous studies have shown a direct correlation between dietary fat and GERD. In present study GERD symptoms were less prevalent in those who were consuming fruits more frequently. In line with present study Nocon et al reported that consumption of fruits has a protective effect, while vegetable consumption had no significant association. Nocon M, Saberi-Firoozi et al also reported protective effects of fruits and vegetables on reflux symptoms in Shiraz City, southern Iran [11]. Smoking has been found to be associated with GERD occurrence. Nocon et al reported that smoking as risk factor for GERD and was dose dependent. In present study we found higher symptoms in those who were both cigarette/bidi and hukka smokers [14]. However, we found no association between reflux symptom and tea with meals or around mealtime. Drinks such as tea were reported to be linked to GERD, but this is controversial. Although tea has been shown to increase acid secretion, but it does not contribute to GERD [17,18]. Previous studies have observed an association between the use of aspirin or NSAIDs and presence of GERD [19]. Higher prevalence of GERD was visible in subjects taking NSAIDs and aspirin, but in our study difference was statistically significant for NSAIDs only. One reason for this statistical significance for aspirin may be the small number of subjects who consumed aspirin in present study.

Conclusion

In present study the prevalence of GERD was found to be 33.76%. GERD prevalence was similar between gender. Prevalence of GERD was significantly higher in older people and obese subjects. Prevalence was lower in those consuming fruits more than once per day. Smoking & aerated drinks had positive correlation with GERD, but non-aerated beverage had an inverse correlation with GERD. The association between GERD and NSAIDs consumption was also significant.

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