

Association of Dietary Practices and Lifestyle Modifications in Gastroesophageal Reflux Disease in Pakistani Women

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Abstract

Background: Gastroesophageal Reflux Disease (GERD) incidence is increasing day by day due to lifestyle changes and living standards that resulted in esophagitis, esophageal adenocarcinoma, Barrett's esophagus and many other illness worldwide. Patients with GERD live with poor quality life and have low work capacity.

Aims: Main aim of the study is to diagnose GERD in early stages for the reduction in mortality and morbidity at different age groups.

Methods: The pre-tested questionnaire was used to collect data from Sir Ganga Ram Hospital Lahore. A total of 230 female patients screened for GERD symptoms were included in this study. The collection of demographic data, dietary intake, lifestyle habits, physiology, and physical analysis were gathered during the 4 months.

Results: Data analysis shows us that GERD is highly significant with age, occupation. Moreover, burping is highly significant in these patients. Fried fatty foods, spicy foods, fizzy drinks, garlic intake were also correlated to GERD symptoms. These subjects also suffer from more skin problems.

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Conclusion: From our results, we infer that GERD has a very strong bond with dietary and lifestyle patterns. If these parameters are kept under control, GERD patients will be less agonize from complications and minimize our morbidity and mortality.

Keywords: GERD; Dietary habits; lifestyle; heartburn; sedentary life; physical activity.

1. Introduction

Gastroesophageal Reflux (GER) is a normal anatomical process to the esophagus through gastric contents, caused several times a day after meals, whereas when associated with symptoms and pathological changes it is termed as gastroesophageal reflux disease (GERD) [1, 2]. GERD is linked with regurgitation of stomach content which is further divided into esophageal and extra esophageal disorder [3]. Esophageal syndromes linked to any symptoms for esophageal injury or not. However, Extra-esophageal syndromes are those which involve GERD related conditions that are possibly associated [4]. The prevalence of GERD varies from population to population. Existing data acclaims that persistent GER signs are widely present in countries of the west (10–20%) than countries of Asian (~5%) and are probably to have elevated over a period [5]. GERD is categorized by essentially two esophageal indicators, one of them is heartburn also known as reflux, and the second is regurgitation that is the onset of vomiting [6]. A total of 25% of the general population is known to feel heartburn relatively once per month [7]. Extra-esophageal manifestations such as cough, dental erosion, laryngitis, non-cardiac chest (epigastric) pain, and asthma are also complementary, but they are not only limited for GERD [6, 8]. Restrictions were found for investigation of GERD patients only on signs because there are people who have endoscopic proofs but do not show any signs, though people how to have signs do not have any proof for GERD [9]. Complexities that can be present with the severity of GERD comprises of esophageal stricture, erosive esophagitis reflux esophagitis, esophageal adenocarcinoma and Barrett's esophagus [6, 10]. Persistent GER can be a reason for long term swelling and damage to the esophageal line [2]. Gastroesophageal reflux disease was identified as the strongest risk factor for esophageal adenocarcinoma [11]. It may be caused due to the growing prevalence of obesity, change in diet, lifestyle factors, tobacco smoking and decreasing H. pylori infection [12, 13]. It is generally perceived that tobacco and alcohol influence the force of lower esophageal sphincter (LES) [14]. Dietary habits were distinguished for initiating GERD [15]. Larger or higher intakes of dietary fat, BMI variations, late-night eating practices, snack preference over proper meals, fussy and uneven eating, and an inclination towards liquefied foods are some of the common risk factors that can cause an onset of GERD [15, 16]. Particularly in females, a high amount of milk and potato raise reflux in esophagitis [17]. Excessive intake of macronutrients was seen to raise levels of adiposity and can cause insulin resistance contributing to GERD [18]. Recently it was illustrated that belly fat measurements are real indicator rather than overall obesity [19]. High intake of calcium, meat, oil, and salt intake are seen to associate with an increased risk for reflux esophagitis (RE) while high intake of protein, carbohydrate, calories from protein (%), vitamin C, grains and potatoes, fruits, and eggs correlates with a reduced risk for RE in Chinese [20]. Mediterranean, a very low carbohydrate, high fiber, low fat diets, non-citrus fruits, income, race, and energy intakes were factors seen that had contributed in reducing GERD symptoms [14, 21, 22]. Citations on lifestyle practices, such as head to the bed elevation and increased duration of time between meals to sleep can help reduce the symptoms of GERD [23]. The main aim of the study is to find out nutritional status and lifestyle that could aggravate

complications of GERD. Higher numbers of GERD patients can give rise to other health issues with more severity and seriousness. Available Literature showed that dietary habits and sedentary lifestyle practices are associated. Our study focuses on devising, and recommending dietary and lifestyle for healthier disease free life.

1.2. Materials and methods

This study was a cross-sectional type. Data was collected at Sir Ganga Ram Hospital Lahore, Pakistan. A pre tested questionnaire regarding demographics, physical analysis, dietary and lifestyle habits on 230 childbearing female GERD patients were registered.

1.3. Inclusion and Exclusion Criteria

Patients were screened for GERD symptoms in 15-50 years childbearing females and were included in our study. Whereas non-cooperative, other gastrointestinal tract (GIT) complications, and patients outside the boundary of Sir Ganga Ram Hospital were excluded.

1.4. Questionnaire Parameters

Questionnaire was divided into different parts; Demographics - age, residential status, geographical status, marital status; Clinical and physical – hair fall, skin problems, weak brittle nails, change in voice, cough, and the status of hydration and evaluation of the physical activity. Lifestyle – symptoms, habits; Dietary – dietary habits, dietary consumption, food frequency were added to the questionnaire.

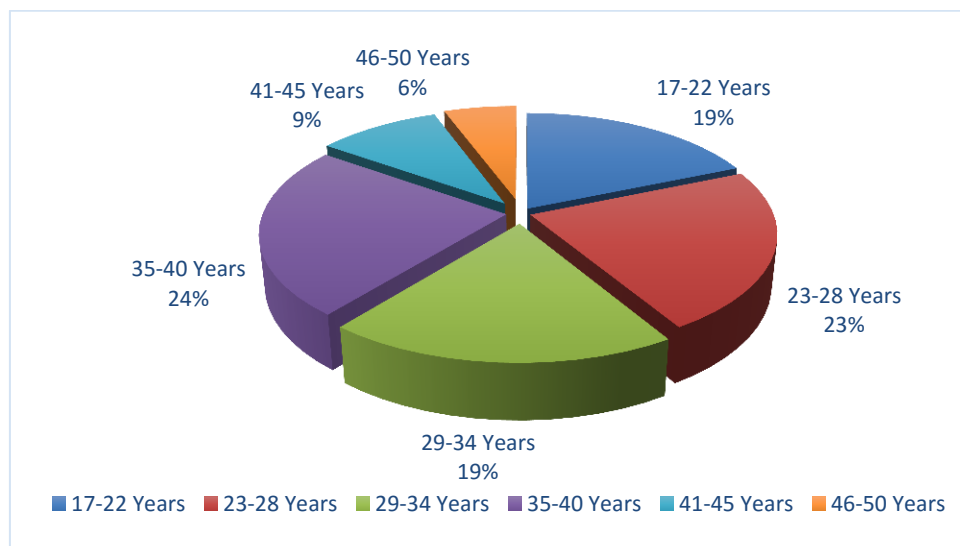


Figure 1: Age Distribution Pattern

1.5. Statistical Analysis

Statistical analysis was done by SPSS version 27 (IBM Inc, USA). One way ANOVA (analysis of variance) was applied with various parameters like age, occupation, and burping. Secondly, Spearman's and Pearson's

correlations were computed between different dietary and lifestyle patterns.

2. Results

Our study showed, after initial screening, that patients with GERD were in ages 17 years to 50 years. Patients' occupation includes student, businessman, job person, and housewives. The distribution pattern is presented in Figure 1. Analysis of Variance (Table 1) showed a high degree of significance to the relationship between GERD patient age to their occupation ($p=0.000$ at 95% CL). Burping ($p=0.023$ at 95% CL) and skin issues ($p=0.019$ at 95% CL) are also show significant association. Interestingly, relaxing the significance level/interval, we find two more significant affiliations with heartburn after the meal ($p=0.083$ at 90% CL) and nails of patients ($p=0.098$ at 90% CL). Pearson's and Spearman's analysis pinpoints high degree of association of green chili to garlic intake ($PC=0.415$; $p=0.000$ at 95% CL). Note: **OP**= occupation of participant, **ES**= economic status of participant, **HBAM**= heartburn after meal, **HBN**= heartburn at night, **FF**= feeling of fullness, **TM**= time to complete meal, **NP**= nail of participant, **SP**= skin of the participant

Table 1: ANOVA

		Sig.
OP	Between Groups	0.000
	Within Groups	
ES	Between Groups	0.150
	Within Groups	
HBAM	Between Groups	0.083
	Within Groups	
HBN	Between Groups	0.457
	Within Groups	
FF	Between Groups	0.430
	Within Groups	
Burp	Between Groups	0.023
	Within Groups	
TM	Between Groups	0.140
	Within Groups	
NP	Between Groups	0.098
	Within Groups	
SP	Between Groups	0.019
	Within Groups	

However, our group find strong interrelatedness with age to occupation ($PC=0.316$; $p=0.000$ at 95% CL), and fizzy drinks ($PC=0.214$; $p=0.000$ at 95% CL). We also infer from our data that age and garlic intake is highly significant and is captivating ($PC=0.198$; $p=0.000$ at 95% CL). Besides other correlations, we also

acknowledged the importance of fried food and garlic intake (PC= 0.209; p=0.001 at 95% CL) that would increase GERD symptoms (Table 2). Our investigation also discovers that fried food and the use of green chili are significantly correlated (PC= 0.156; p=0.018 at 95% CL). Besides these outcomes, our analysis also shows that patient skin issues were also significantly correlated to age (PC= 0.152; p=0.021 at 95% CL), as well as consumption of fizzy drinks (PC= 0.135; p=0.040 at 95% CL). Our other findings, two interestingly negative associations were also highlighted where burping with garlic (PC=-0.169; p=0.010 at 95% CL and age (PC= -0.165; p=0.012 at 95% CL) are significantly placed (Table 2).

Table 2: Correlations

		AP	OP	burp	SP	FD	GI	GCI	FFI
AP	PC	1							
	Sig. (2-T)								
OP	PC	0.316**	1						
	Sig. (2-T)	0.000							
burp	PC	-0.165*		1					
	Sig. (2-T)	0.012							
SP	PC	0.152*			1				
	Sig. (2-T)	0.021							
FD	PC	0.214**			0.135*	1			
	Sig. (2-T)	0.001			0.040				
GI	PC	0.198**		-0.169*			1		
	Sig. (2-T)	0.003		0.010					
GCI	PC						0.415**	1	
	Sig. (2-T)						0.000		
FFI	PC						0.209**	0.156*	1
	Sig. (2-T)						0.001	0.018	

**Correlation is significant at the 0.01 level (2-T) * Correlation is significant at the 0.05 level (2-T).

Note: **AG**= Age of participant, **OP**= occupation of participant, **SP**= skin of participant, **FD**= fizzy drinks, **GI**= garlic intake, **GCI**= green chili intake, **FFI**=fried food intake

3. Discussion

GERD is with chronic esophageal symptoms that attributed to gastroesophageal reflux disease (GERD) – common presenting symptoms in gastroenterology that can lead to high health care costs [24]. GERD woe and diagnosis, treatment is essential as it weighs a heavy burden in quality of life [25]. According to our research analysis on 230 female GERD patients, we find that in development of GERD in younger adulthood i.e. ≥ 28 years is alarming. Other similar studies on the prevalence of gastroesophageal reflux revealed that subjects under 20 years of age suffer more as compared to elder age adults [20]. Incidence was higher in females and it raised monotonically with an increase in age [26, 27] as we observe in our finding (Figure 1). In an Indian study,

patients over 30 year age tends to be a risk factor in GERD occurrence [28]. On a similar ground, a German study, GERD prevalence appears to increase gradually from younger age group to a tapering at 60-69 years with 25% subjects. These subjects report moderate or severe symptoms [29]. Global data on GERD shows that rich people are concentrated significantly more than poor people. This shows significant socioeconomic inequality in GERD appearance along with some individual factors [30]. In an Indonesian study, however, showed that age is not a significant factor in symptoms of GERD. Whereas in many other studies, Yamamichi and coworkers [31], Kulig and coworkers [32] and Shimazu and coworkers [33], showed on the contradictory. Moskowitz and his colleagues [34] also reported that GERD prevalence is strongly linked to increasing age which reinforce our case. In present study, we also finally conclude that age appeared to be a risk factor for GERD as shown by Chowdhury and colleagues with individuals over the age of 30 years. In our study the majority of the females were housewives and they were not performing any physical exercises/activity. Number of studies had revealed, a univariate analysis on females, that it is more associated to GERD. Many studies on the GERD patient's occupation suggest that there is a significant relationship with the occupation, as shown in a Chinese study [35]. One of the Indian study, and a Pakistani investigation, demonstrated that housewives have much more GERD manifestations than any other occupation [36, 37]. In our study, however, our inclusion criteria for screening in GERD patients for females doesn't not fit to above criteria [28]. GERD can be correlated with some autoimmune skin disorders such as Epidermolysis bullosa, Pemphigus Vulgaris, Cicatricial pemphigoid, and Lichen planus [38]. It can impair the quality of life by skin appearance with signs and symptoms with tissue lesions or not [39]. Our finding from Analysis of Variance (One-way ANOVA) demonstrated that skin condition is highly significant relationship to GERD and along with burping (Table 1). Previous work have shown that patients suffer more adversely in GERD rather than RE, tend to have worse symptoms of systemic sclerosis (SSc) [40]. Moreover, it was seen that GERD was also interrelated to urticaria [41]. Patients consuming medicines, believe in the importance of dietary as well as and lifestyle management is a good option for GERD [23]. From our analysis, some of the food ingredients tend to relate significantly with GERD. These ingredients can worsen the symptoms [38]. The ingredients, in our study also, included green chili, garlic, lemon, raw onion, butter, fried fatty food and supplementary spices [39]. On similar grounds, fizzy drinks are also one of the cofactors [40]. In our thought-provoking conclusion show that carbonated cola are highly correlated to the symptoms of GERD (Table 2). On the contrary some other literature citations show that carbonated cola doesn't cause detectable gastric reflux, rather it may elicit symptoms of heartburn during that period [41, 42]. Hot spicy stews, fried food, rice cakes, and ramen noodles also draw recurrent symptoms. In one of our other findings, red chili, black pepper, rice portion, fried food other spices are highly significantly correlated (data not shown). A Korean investigation showed that patients with risk of GERD, exhibits regularly warning sign to hot spicy stews, fried foods, doughnuts, loaves of bread, ramen noodles, coffee, pizza, topokki, rice cakes, champion noodles, and hotdogs [42]. This is again well concomitant to our results. Interestingly we find the high consumption of pickles and processed foods are also significant in an upswing of GERD [43]. Modification in Lifestyle patterns plays a crucial role in the control of GERD [44]. Our research data also proposes that eating quickly, instant laying after meals, and lack of sleep are concomitant to increase symptoms of GERD. A similar finding was also elaborated by Yadegarfar and coworkers [45]. Contradictory studies, moreover, show that skipping breakfast, bedtime dinner, and midnight snacks were not associated risk for GERD [45]. In an elderly population, unhealthy habits such as hot-eating, fast-eating, over-eating and tight belt

creates high risk factor for GERD. The lifestyles such as chewing food thoroughly, splitting warm and cool meals with not too tight belt prevent patients from GERD signs and symptoms [46]. From our investigation, we inclined to infer that these above factors also contribute significantly in GERD indications. Analysis of Variance data on economic status showed that physical activity, status of hydration, sleep pattern to meal timings, and sleep duration showed highly correlated values (data not shown). Lam and colleagues provided quite strong support to our conclusion on recreational physical activity in the reduction of GERD [47]. Lower lifestyle activities, particularly physical activity, late meals in evening, post dinner lying, incomplete and inadequate sleep, and smoking are associated with GERD symptoms [48] as seen in our situation (Table 2). In recent literature reading, women with nocturnal (n) GER are shown to have higher risk of acquiring GERD. This also further aggravated with sleepiness and snoring [49]. Our data also provide very similar final conclusions. Irregular sleep habits and dinner just before bedtime also correlate positively to our data mining with GERD [50]. In the final say, a significant number of patients in our study show compromised Quality of Life (QOL) due to GERD. Associated factors to GERD affect these patients with increasing age, increased body mass Index BMI, history of smoking, hypertension and Diabetes Mellitus (DM) profoundly affect QOL in these subjects. [51]. Tea consumption with meals was seen highly significant in aggravating the symptoms of GERD. However a high negative correlation was seen between tea and economic status. Similar results were illustrated too, at Shifa International Hospital Islamabad [52]. Dietary patterns and foods that could aggravate the symptoms of GERD should be eliminated from the diet. Henceforward there should be practice of counseling patients and creating awareness regarding lifestyle modifications to reduce GERD symptoms and reliance of medications solely.

4. Recommendations

Our results are indicative that GERD can be corrected with diet and lifestyle modification. Here we recommend the following steps to curtail this disease.

- Keep yourself physically active by exercise/brisk walking. However, exercise right after meals should be avoided
- Monitor your timing of the meal to sleep pattern
- Hydration status should be monitored
- Avoid quick eating practices
- Keep a control on your rice portion
- There should be a lesser intake of fried fatty food, spices, garlic, fizzy drinks
- Half-yearly screening for *Helicobacter pylori* should be done to avoid future complications of GERD and carcinoma

5. Conclusion

Gastroesophageal reflux is a very serious condition which can be turned into a life threatening disease. Its worsen symptoms are seen to be associated with impaired dietary and lifestyle patterns. The increased incidence levels of GERD emphases to alter the lifestyle habits as well as dietary patterns. Physical activity should be

included in daily routine and foods that can aggravate the symptoms (especially fried, fatty, spicy) should be restricted. Precautionary measures should be made, as discussed above to reduce the mortality and morbidity rate of GERD patients.

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