

Research Article

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GERD is Common and Causes Significant Quality of Life Impairment: Results from Outpatients in Dar es Salaam, Tanzania

Komba E^{1*}, Leyna G², Nkandala I¹, Mugusi F¹ and Pallangyo K¹

¹Departments of Internal Medicine, Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania

²Departments of Epidemiology and Biostatistics, Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania

ABSTRACT

Background: Gastroesophageal reflux disease (GERD) is reported to occur in 10-20% of general population in Western countries and in about 5% in Asian countries. There is little data regarding its prevalence, pattern, associated factors and impact on the quality of life in African countries. The aim of this study was to determine the prevalence, pattern, quality of life and factors associated with GERD among outpatients in the city of Dar es Salaam in Tanzania.

Methods: Between 01 June 2013 and 31 July 2013, a total of 1062 adults aged 18 years and above were recruited into this cross-sectional study and completed Swahili-language self-administered questionnaires. The Frequency Scale for the Symptoms of GERD questionnaire was used as a diagnostic tool for GERD and quality of life was assessed using the Quality of Life in Reflux and Dyspepsia (QOLRAD) questionnaire.

Results: The mean age \pm standard deviation of the study participants was 46.0 ± 19.5 years and 60.5% were females. The prevalence of GERD was 31.5% and was higher among females compared to males ($p = 0.001$). The quality of life in patients with GERD was lower in all five domains of the QOLRAD questionnaire. About two thirds (59.7%) of patients with GERD had previously sought medical advice and 59.6% had used medications for their GERD symptoms.

Conclusions: The prevalence of GERD was high in this patient population and was significantly higher among females compared to men. Participants with GERD demonstrated significant impairment in the quality of life.

*Corresponding author

Komba E, Department of Internal Medicine, Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania. E-mail: kombaewaldo@gmail.com; ekomba@muhas.ac.tz

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Introduction

Gastroesophageal reflux disease (GERD) occurs when gastric juice refluxes into the esophagus to cause troublesome symptoms with or without associated esophageal mucosal injury or complications [1].

The typical reflux symptoms of heartburn and/or acid regurgitation are used to estimate the prevalence of GERD; and have been reported to vary from one population to another [2-5]. When defined as at least weekly heartburn and/or acid regurgitation, the prevalence of GERD in the Western world generally ranges from 10% to 20% while the prevalence in Asia is reported to be less than 5% [2-5]. In Africa, studies have been published from only a few countries on the prevalence of GERD [6-8, 9]. Furthermore, we could not find any published studies from Africa that have examined the impact of GERD on the quality of life of the affected patients.

A number of studies have investigated for the possible risk factors that influence the prevalence of GERD. Overweight and

obesity have been reported to be associated with GERD [6,10-12]. Interestingly, data from Korean Nurses' Health Study found positive associations between GERD with both low ($\text{BMI} \leq 18.5 \text{ kg/m}^2$) and high $\text{BMI} (\geq 23 \text{ kg/m}^2)$ [13].

In addition, a number of studies have shown a significant association between smoking [10,11], alcohol consumption and GERD. In contrast results from Tunisian and Nigerian studies did not find any association between alcohol consumption and/or smoking with GERD [6,7].

Female sex has been positively associated with GERD in studies from Tunisia, South Africa and USA and elsewhere but such association was not found in some studies [6,12,14-16].

Reports on the association between GERD and age has not been consistent with some demonstrating a positive association [15,17,18] and others reporting lack of association. The inconsistent reports on association between GERD and a number of sociodemographic factors call for more studies and in different communities to get answers to the unresolved questions.

GERD related symptoms affect many aspects of day-to-day functioning, including sleep, productivity at work and at home, enjoyment of meals and social occasions. In addition, symptoms can also cause significant emotional distress. Disease severity correlates strongly with health related quality of life (HRQoL) and also contributes to work absenteeism and reduced productivity.

Assessing the impact of reflux symptoms on patients' lives can provide important information on health status and perceived treatment efficacy[19]. Non GERD disease features, such as the presence of anxiety and comorbid conditions, also negatively impact on HRQoL[19].

This study was performed to determine the prevalence, pattern, quality of life and sociodemographic factors associated with GERD among patients attending outpatient clinics at a regional hospital in Dar es salaam, Tanzania.

Materials and Methods

Study Design and Setting

This was a hospital-based cross-sectional study conducted between 01 June 2013 to 31 July 2013 at Mwananyamala Regional Referral Hospital (MRRH), and serves for both private and public health facilities in the Kinondoni region in Dar es Salaam which has a population of more than two million people. On average about 1500-1700 patients attend the hospital's outpatient clinics every day.

Study Population

All adults aged ≥ 18 years attending the outpatient clinics at MRRH were eligible for the study. The outpatient clinics comprised the following units: general outpatient clinic, reproductive and child health clinic, oral health clinic, eye clinic, diabetes clinic, tuberculosis and leprosy clinic, mental health clinic, voluntary care and testing clinic, National Health Insurance Fund clinic, HIV/AIDS care and treatment clinic and physiotherapy clinic. There were no exclusion criteria.

Sample Size Estimation and Recruitment of Participants

The sample size chosen was estimated at least 974 persons in a calculated expected prevalence of 24% [4] with a risk alpha and beta respectively 5% and 1%. Considering a response rate of about 80% then the minimum sample size was supposed to be 974 subjects.

Systematic sampling technique was employed in recruiting study participants. On average about 1500-1700 patients were attending MRRH outpatient clinics every working day. This made a sampling frame of about 1500 subjects. Data was collected for 45 days from 01 June to 31 July 2013. A total 1062 subjects were recruited into the study.

Data Collection Tools

All participants completed the Swahili language versions of the Frequency Scale for the Symptoms of GERD (FSSG) questionnaire and the Quality of Life in Reflux and Dyspepsia (QOLRAD) questionnaire. A research assistant was readily available to answer questions and provide clarification where needed. Swahili is the official and business language in Tanzania.

The Frequency Scale for the Symptoms of GERD (FSSG) Questionnaire

FSSG is a widely used questionnaire for the diagnosis of GERD and evaluation of the effectiveness of treatment (18). Questions of FSSG consist of acid reflux symptoms and dysmotility symptoms.

FSSG questionnaire was translated into Swahili version and then back-translated from Swahili to English to ensure validity. The diagnosis of GERD using FSSG was as described in a study by Shiota S et al (18)

The Quality of Life in Reflux and Dyspepsia (QOLRAD) questionnaire

QOLRAD consists of 25 items combined into five domains: emotional distress, sleep disturbance, vitality, food/drink problems and physical/social functioning. All questions were rated on a seven-point Likert scale according to the response options. The lower the value on the QOLRAD questionnaire, the more severe the impact on daily function.

In addition, another questionnaire was used to gather information on demographic characteristics (age, gender, weight, height, educational level, occupation, marital status), predominant symptom(s) and duration of symptom(s), factors thought to affect the occurrence of GERD (such as alcohol consumption and cigarette smoking), consultation behavior, previous treatments for GERD, and dietary intake (high fat diet, high protein diet, high carbohydrate diet, carbonated drinks, coffee)

The questionnaires were self-administered and research assistants clarified the questions in cases where participants faced difficulties in filling the questionnaires. Participants who could not read and write were assisted by research assistant to fill in the questionnaires (i.e. questionnaires were administered by interviewers).

Data Analysis

All filled questionnaires were coded before entering into the computer using Statistical Package for Social Sciences (SPSS) version 20.0 statistical software. This software was also used for data analysis. Frequency distributions and two-way tables were used to summarize the data. Multiple logistic regression analysis was performed to determine associations; in this model, all factors with p -value ≤ 0.2 in the chi-squared test were analyzed. Mean individual domain scores were calculated separately for both GERD and CONTROL patients and compared using the paired t test. A p -value of ≤ 0.05 was considered significant for the multivariate analysis.

Ethical Consideration

Ethical clearance was obtained from Muhimbili University of Health and Allied Sciences ethical committee. Permission to conduct the study at MRRH was obtained from the District Medical Officer's office and the hospital's administration. Each patient provided a written informed consent before participating in this study and all information obtained from the study participants was kept confidential. All patients diagnosed with GERD were directed to the appropriate medical clinic for care of their symptoms.

Results

Characteristics of Study Subjects

A total of 1200 patients attending MRRH for consultations at the outpatient clinics were selected by systematic sampling technique and asked to complete the FSSG and QOLRAD questionnaires. Thirty-eight patients refused to participate in the study. Therefore, 1062 persons (419 [39.5%] males and 643 [60.5%] females) were enrolled into the study. The main characteristics of the study population are summarized on Table 1.

Table 1: Sociodemographic Characteristics of the Study Subjects (N =1062)

Variable	Male (%) N=419	Female (%) N=643	Total (%) N=1062	P-Value
Mean age in years (SD)	48.0(20.7)	44.7(18.7)		0.008 *
Sex	419(39.)	643(60.5)	1062(100.0)	
BMI (Kg/m²)				0.121
<18.5	25(6.0)	42(6.5)	67(6.3)	
18.5-24.9	249(59.4)	382(59.4)	631(59.4)	
25-29.9	113(27.0)	149(23.2)	262(24.7)	
30+	32(7.0)	70(10.9)	102(9.6)	
Age Groups (Years)				0.001
18-40	183(43.7)	318(49.5)	501(47.2)	
41-60	93(22.2)	171(26.6)	264(24.9)	
61+	143(34.1)	154(24.0)	297(28)	
Marital Status				0.0001
Single	113(27)	145(22.6)	258(24.3)	
Married	274(65.4)	363(56.5)	637(60.0)	
Ever married	32(7.6)	135(21.0)	167(15.7)	
Education				0.0001
No	81(19.3)	197(30.6)	278(26.2)	
Primary	236(56.3)	328(51.0)	564(53.1)	
Secondary	85(20.3)	94(14.6)	179(16.9)	
Higher	17(4.1)	24(3.7)	41(3.9)	
Smoking				0.0001
Never	290(69.2)	604(93.9)	894(84.2)	
Ever	80(19.1)	33(5.1)	113(10.6)	
Now	49(11.7)	6(0.9)	55(5.2)	
Alcohol				0.0001
Never	229(54.7)	493(76.7)	722(68.0)	
Ever	120(28.6)	97(15.1)	217(20.4)	
Now	70(16.7)	53(8.2)	123(11.6)	
Income (TSh)				0.0001
<100000	246(59.4)	491(77.2)	737(70.2)	
105 – 500000	165(39.9)	144(22.6)	309(29.4)	
>500000	3(0.7)	1(0.2)	4(0.4)	

Abbreviations: BMI = body mass index, TSh = Tanzanian shilling; DF =Degree of Freedom

As shown in table 1, the mean age for the study population in years was 48.0 and 44.7 for males and females respectively (p=0.008). Overall 24.7% of the study population were overweight (BMI \geq 25-29.9) and another 9.6% were obese (BMI \geq 30). There were no significant differences in BMI values between women and men (p=0.221). Smoking and/or alcohol use were significantly higher among men compared to women (p=0.001). In addition, the monthly income was significantly lower among women compared to men.

Prevalence and Pattern of GERD

The prevalence of GERD among the 1062 study participants was 31.5% (322/1062) and by sex it was (24.6%) and (35.9%) for male and female respectively (p=0.001). Furthermore, we found that 53.1% (171/322) of participants with GERD had been having symptoms for less than six months. Over 92% (297/322) of participants with GERD reported to get symptoms at least once weekly.

Using daily, weekly and monthly symptoms as different diagnostic criteria for GERD, the prevalence in the 1062 participants in this study were 11.5%, 28% and 30.1% respectively.

About one third (96/322) of the patients with GERD reported to have had severe symptoms and over 60% (190/313) of them had at some point attended a health facility and were given medication to control their symptoms.

Regarding the pattern of GERD in this population, the findings showed no significant differences between males and females with regards to duration, frequency and/or severity of symptoms. In addition, medical consultation and use of drugs for the GERD symptoms was not significantly different between females and male study participants. These findings are shown in Table 2.

Table 2: Pattern of GERD (N =334)

Variable	Missing	Male (N=103)	Female (N=231)	Total N=334	P-Value
Duration of symptoms (months)	12				0.753
< 6		58(57.4)	113(51.1)	171(53.10)	
6-11		24(23.8)	58(26.2)	82(25.5)	
12-59		12(11.9)	33(14.9)	45(14.0)	
60+		7(6.9)	17(7.7)	24(7.5)	
Symptom frequency	12				0.742
Daily		40(39.6)	82(37.1)	122(37.9)	
Weekly		53(52.5)	122(55.2)	175(54.3)	
Monthly		8(7.9)	15(6.8%)	23(7.1)	
Yearly		0(0.0)	2(0.9)	2(0.6)	
Symptom severity	12				0.613
Mild		17(16.8)	47(21.3)	64(19.9)	
Moderate		54(53.5)	108(48.9)	162(50.3)	
Severe		30(29.7)	66(29.9)	96(29.8)	
Consulted health care provider	21	55(59.1)	135(61.4)	190(60.7)	0.333
Used medicines	0	60(58.3)	139(60.2)	199(59.6)	0.809

Factors Associated with Gastroesophageal Reflux Disease

Results of univariate and multivariate analyses of factors associated with GERD are shown in Table 3. Participants with GERD were on average 6.1 years older than those who did not have GERD. In the univariate analysis age group 41-60 years, being married, primary education, current smoking, current alcohol consumption and male sex were significantly associated with GERD. (Table 3) However, as shown in Table 3, in the multiple logistic regression analysis, increasing BMI was positively associated with GERD. In addition, male sex appeared to be protective against GERD ($p = 0.001$) The other factors were not significantly associated with GERD.

Table 3: Univariate and Multivariate Analyses of the Factors Associated With Gastroesophageal Reflux Disease (N =1062)

Variable	OR (95% CI)	P-value	aOR	P-value
Age groups (years)				
18-40	1		1	
41-60	0.61 (0.45- 0.84)	0.002	0.92(0.61-1.38)	0.680
61+	1.17 (0.83- 1.65)	0.370	1.32(0.90-1.94)	0.155
Sex				
Female	1		1	
Male	0.58 (0.44-0.77)	0.0001	0.58(0.42-0.80)	0.001
BMI (kg/m²)				
<18.5	1			
18.5 -24.9	1.77 (0.94-3.36)	0.378	2.62 (1.44-4.77)	0.002
25 – 29.9	0.91 (0.58-1.43)	0.673	2.34 (1.23-4.44)	0.010
30+	1.09 (0.67-1.78)	0.738	2.68 (1.27-5.66)	0.010
Marital status				
Single	1			
Married	0.38 (0.24- 0.59)	0.0001	0.63 (0.38-1.05)	0.077
Ever	0.82 (0.58- 1.17)	0.275	1.13 (0.76-1.67)	0.558
Education				
No	1			
Primary	2.99 (1.34- 6.73)	0.008	2.28 (0.98-5.33)	0.057
Secondary	1.72 (0.78- 3.80)	0.180	1.47 (0.65-3.32)	0.352
Higher	1.30 (0.56-3.04)	0.538	1.37 (0.58-3.25)	0.470
Smoking				

Never	1			
Ever	1.81 (0.92- 3.55)	0.087	1.37 (0.66-2.85)	0.397
Now	2.65 (1.24- 5.66)	0.012	2.08 (0.92-4.69)	0.078
Alcohol				
Never	1			
Ever	1.40 (0.90-2.18)	0.132	1.11 (0.69-1.78)	0.666
Now	1.78 (1.08-2.91)	0.023	1.33 (0.78-2.26)	0.301
Income (TSh)	1			
<100000	0.815 (0.61-1.08)	0.158		
105 – 500000	1.47 (0.15-14.17)	0.741		
>500000	1.19 (0.12-11.64)	0.878		

Abbreviations: BMI = body mass index, TSh = Tanzanian shilling; OR – Odds Ratio; aOR – adjusted Odds Ratio; 95%CI – 95% Confidence Interval

Quality of Life of Subjects with GERD

Figure 1 shows comparison between the mean QOLRAD domain scores for participants with GERD and those without GERD. Participants with GERD had significantly lower mean scores in all five QOLRAD domains ((emotional distress, sleep disturbance, food/drink problems, physical/social functioning and vitality) compared to those without GERD.

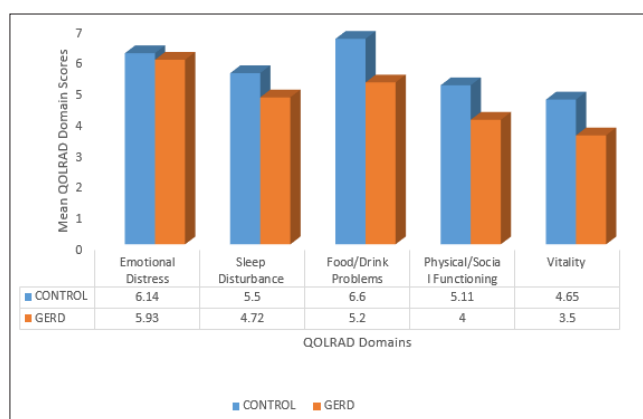


Figure 1: Comparison of Mean Quality of Life in Reflux and Dyspepsia (QOLRAD) domain scores between participants with GERD and those without GERD (Controls)

The mean differences (95% CI) between participants with GERD and those without GERD in the five QOLRAD domains were -0.210 (-0.330 to -0.091); -0.782 (-0.964 to -0.599); -1.481 (-1.651 to -1.311); -1.105 (-1.272 to -0.938) and -1.174 (-1.41 to -0.939); for emotional distress, sleep disturbance, food/drink problem, physical/social functioning and vitality respectively. All these mean differences were statistically significant (P-value < 0.001).

Discussion

There is general agreement that the prevalence of GERD varies in different parts of the world [7]. However, it is important to point out here that epidemiologic studies of GERD are hampered by the absence of an easy-to-use gold-standard to diagnose the disease [21]. Available data show GERD symptoms occur at least once a week in about 10% - 38% of the adult population in the USA and Western European countries; and in 5% or less than in Asian countries[2-5]. There has been little data on the prevalence of GERD from Africa and there was a common misperception that GERD and its complications are rare in Africa [7].

In the present study, the overall prevalence of GERD was 31.5 percent. Our findings are similar to those reported from studies done in Nigeria (26.34%) and (28.1%); Tunisia (24%) and Cote d'Ivoire (22.3%) [6,7,8,22] Taken together our results and those from Tunisia, Nigeria and Ivory Coast indicate that GERD is a common condition in Africa.

In this hospital based study the prevalence of GERD among females was 35.9% (231/643) compared to 24.6% (103/419) among men (p=0.001). Similar observations have been reported by others. Results from a study conducted among South African black population found significantly higher prevalence of GERD among women compared to men [14]. Yamasaki et al[15] extracted information on GERD from a USA nationwide database covering a period of 11 years and found that 60% of patients with GERD were women. In addition results from another study done in Iran found that GERD was more common among females than men.[23].

However, results from a nationwide population based study done in Argentina found a higher prevalence of GERD among females than men but the differences were not statistically significant [24]. The strong association between female sex and GERD in our study is likely to be multifactorial. First, health seeking behaviour is known to be higher among females than men suggesting that women with symptoms due to GERD (or any other illness) are more likely to seek medical help than men. Also it is likely that females may experience higher frequency and severity of symptoms of GERD compared to men [25] which in turn influences health seeking behavior. Other factors unknown to us could be at play too.

Overweight and obesity were observed in 24.7% and 9.6% of participants respectively. The study findings show positive association between GERD and BMI values above the normal range. Similar observations have been reported by others. GERD was associated with increasing BMI in a community-based study in the United Kingdom [10] among Japanese who underwent routine medical examination[18] and among an unselected adult community in Finland [7].

Obesity is a known risk factor to GERD and increasing BMI has been associated with GERD [16] Significant increasing rates of obesity in North America, Western Europe and Japan has been reported to have occurred during the past five decades. And the high rates of obesity in these populations have been linked with increased rates of GERD symptoms and associated diseases [26]. Traditionally, the belief has been that excessive abdominal fat causes increased intraabdominal pressure thereby promoting

esophageal reflux. In addition, increased visceral adipose tissue has been shown to produce cytokines that can cause inflammation of the esophagus [27]. Obesity rates are fast increasing in Africa especially in urban areas due to change in life style and eating habits. It will be interesting to see what happens to rates of GERD symptoms and associated diseases in Africa with impending rising obesity rates.

About two thirds of the study participants reported to have consulted healthcare providers to seek help for their symptoms. The current study was performed at a regional hospital where patients are usually referred from lower healthcare facilities. Patient referrals to a higher level of care may be due to a number of factors including but not limited to, need for investigations and/or treatment not available at the lower level care facility. Secondly, the referral may be done after unsatisfactory response to treatment provided at the lower health care facility. Thirdly, patients presenting with severe symptoms/disease which may require hospitalization would merit referral to a facility like the one in which this study was conducted. The expectation therefore should be that most of the eligible study participants would have been attended and given medication before being referred to the regional hospital where we conducted this study. Hence as shown in Table 2 most patients had moderate to severe symptoms which affected the daily functioning. Findings from studies done in different settings have reported lower rates of healthcare seeking behavior compared to our study [4,7]. Indeed, accessibility to health care delivery systems, socio- cultural practices are important and major factors that influence health seeking behavior in any population.

Health related quality of life (HRQoL) is determined by both disease and non-disease related factors [17]. In chronic illnesses, such as gastroesophageal reflux disease, daily function, HRQoL status, and health resource utilization are critical outcomes. Patients suffering from GERD may report many symptoms, such as heart burn or regurgitation, and health care seeking is driven by both symptom severity and the impact on HRQoL. The study findings demonstrate that the quality of life of individuals with GERD was significantly lower than that of the reference groups. These findings are consistent with those from other studies. For instance, Kulig M et al demonstrated that the quality of life of individuals with reflux disease was significantly lower than that of the general population (28). And that the quality of life of GERD patients was actually similar to that of patients who had suffered from acute coronary events. The significant impairment in the quality of life of GERD patients could be attenuated or normalized within a short time period by treatment with proton pump inhibitors [29]. However, the present study did not assess the effect of therapy on HRQOL among GERD patients but rather compared those with the disorder against those without it. This study is hospital based and therefore the findings may not be applicable to the general population or indeed at different levels of health care provision. However, the study has demonstrated that GERD is a common problem (in settings like this one) in Dar es salaam, Tanzania; that it causes significant impairment in health related quality of life which can be treated with proton pump inhibitors.

Conclusions

The prevalence of gastroesophageal reflux disease was high among patients attending outpatient clinics at Mwananyamala Regional Hospital in Dar es salaam and was significantly higher among female participants. Majority of patients with GERD had sought medical advice and also took medications for their symptoms.

GERD causes a significant impairment in the quality of life of affected persons.

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