https://doi.org/10.22516/25007440.1178

Original article

Proton Pump Inhibitors and Quality of Life in Patients with Globus Pharyngeus: An Observational Study

Valeria Arango-García,[1] Steven Osorio-Anaya,[1] Ismael Yepes-Barreto.[2*]

OPEN ACCESS

Citation:
Arango-García V, Osorio-Anaya S, Yepes-Barreto I. Proton Pump Inhibitors and Quality of Life in Patients with Globus Pharyngeus: An Observational Study. Revista. colomb. Gastroenterol. 2025;40(1):31-38.
https://doi.org/10.22516/25007440.1178

[1] Pharos, Science, Technology and Health Research Group, Department of Otorhinolaryngology, School of Medicine, Universidad de Cartagena. Cartagena, Colombia.
[2] Pharos, Science, Technology and Health Research Group. Assistant professor, Research Department, School of Medicine, Universidad de Cartagena. Scientific Director, Gastropack Research Center. Cartagena, Colombia.

***Correspondence:** Ismael Yepes-Barreto.
ismayep@yahoo.com

Received: 15/02/2024
Accepted: 04/07/2024

Abstract

Introduction: Globus pharyngeus accounts for up to 4% of otolaryngology consultations. There is no consensus in the literature regarding its treatment; however, most studies agree that gastroesophageal reflux is the primary etiological factor. **Objective:** To determine whether treatment with proton pump inhibitors is associated with changes in the quality of life of patients with globus pharyngeus. **Methods:** This prospective observational study included patients who attended otolaryngology outpatient consultations between January and December 2022 and were diagnosed with globus pharyngeus. All patients underwent a comprehensive otolaryngologic evaluation, and the following assessment tools were used before and after three months of treatment: the Reflux Symptom Index (RSI), the Reflux Finding Score (RFS), the Glasgow-Edinburgh Throat Scale (GETS) for globus pharyngeus, and the SF-36 Quality of Life Questionnaire. **Results:** The study population consisted of 35 patients, 27 of whom were women (77.1%), with an average age of 55.2 years. Improvement was observed in all RSI scale parameters. Quality of life improved after treatment in the domains of bodily pain, vitality, social functioning, emotional role, and mental health. **Conclusions:** In this observational study, treatment with proton pump inhibitors significantly improved symptoms associated with globus pharyngeus.

Keywords

Globus pharyngeus, quality of life, proton pump inhibitors, gastroesophageal reflux.

INTRODUCTION

Globus pharyngeus is a common condition that may account for up to 4% of otolaryngology consultations[(1)]. Its prevalence in the general population is approximately 12.5% in the United States[(2,3)], and up to 45% of healthy volunteers in a study conducted in the United Kingdom reported experiencing it[(4)]. It has a peak incidence in middle age, with an average age of onset of 43 years (range: 22 to 71 years)[(5)]. Some authors have reported a higher prevalence among women[(6)], while others have found similar rates in both men and women[(7)]. This is a poorly understood condition, often difficult for patients to describe. It is associated with a wide range of symptoms and significant interpersonal variability, which has limited the development of standardized diagnostic and treatment protocols.

Due to the lack of consensus on the etiology of globus pharyngeus, there is no standardized algorithm for its diagnosis and treatment. An example of this is a study conducted in the United Kingdom, where 14% of otolaryngologists did not perform any diagnostic tests in patients presenting with globus pharyngeus symptoms and instead prescribed treatment with proton pump inhibitors (PPIs). The remaining 86% investigated the symptoms using a

variety of methods, including esophagogastroduodenoscopy (61%), barium swallow (56%), or a combination of both approaches (17.5%)[8].

Although several studies have reported an association between globus pharyngeus and psychosomatic disorders, such as anxiety and depression[9,10], there is only one known study that evaluates quality of life before and after initial otolaryngology consultation, without providing any specific treatment other than patient education. In this study, conducted by Pia Järvenpää et al. in 2017[11], 30 patients with globus pharyngeus underwent physical examination and nasofibro-laryngoscopy. The evaluation also included the Reflux Finding Score (RFS), as well as questionnaires such as the Reflux Symptom Index (RSI), the Dysphagia Handicap Index (DHI), and the 15D Quality of Life Questionnaire. The results showed that patients with globus pharyngeus had higher disability scores, which improved after four months of follow-up without any specific treatment. Furthermore, up to one-third of patients declined additional testing following the initial consultation[11].

Although this study suggests a possible psychosomatic origin for this condition, the role of PPI therapy has not been extensively studied. This appears contradictory, considering that laryngopharyngeal reflux has been regarded as the primary etiology of globus pharyngeus[7,12]. The aim of this study is to determine the relationship between PPI treatment and changes in quality of life in patients with globus pharyngeus.

METHODOLOGY

This research study was approved by the Department of Research and the Ethics Committee of the School of Medicine at the Universidad de Cartagena. An observational, prospective linear study was conducted, based on a before-and-after design. It included 35 conveniently selected patients who attended outpatient otolaryngology consultations at Gastropack Medical Center and ORL del Caribe in Cartagena between January and December 2022, presenting globus pharyngeus as their main reason for consultation. Patients between 18 and 75 years of age were included. Exclusion criteria were: incomplete questionnaire data; current or recent (within the past year) treatment with PPIs; suspected diagnosis of other upper aerodigestive tract conditions; or alarm symptoms suggestive of malignancy of the upper digestive tract, such as weight loss, dysphagia, odynophagia, or symptom lateralization.

Prior to signing the informed consent form, all patients underwent a comprehensive otolaryngologic evaluation, including nasofibrolaryngoscopy. The Reflux Symptom Index (RSI), the Reflux Finding Score (RFS), the Glasgow-Edinburgh Throat Scale (GETS) for globus pharyngeus, and the SF-36 questionnaire were administered to assess quality of life. Esomeprazole 40 mg was prescribed every 12 hours for 3 months. After the treatment period, the RSI, RFS, GETS, and SF-36 assessments were repeated. All survey data were collected directly by the principal investigator via telephone.

The RSI is a scale used to assess the degree of laryngopharyngeal reflux symptoms. It is based on nine items scored from 0 to 5, depending on the severity of the symptoms, with a maximum score of 45. A score greater than or equal to 13 is indicative of laryngopharyngeal reflux[13]. The GETS scale was designed to evaluate patients with globus pharyngeus symptoms, estimating the presence and severity of common throat complaints on a scale from 0 to 7. The last two items are questions that help establish a relationship between globus and the patient's quality of life[14]. The RFS is an endoscopic findings scale developed to analyze the laryngopharyngeal changes caused by laryngopharyngeal reflux. The maximum score is 26, and a score of 7 or higher is considered highly suspicious for this condition[15].

For the estimation of quality of life, the recommendations established in the SF-36 manual were followed. After the administration of the questionnaire, the following steps were carried out:

1. Homogenization of the response direction by recoding the 10 items that required it, ensuring that all items followed the gradient of "the higher the score, the better the health status."
2. Calculation of the sum of the items that make up the scale (raw score of the scale).
3. Linear transformation of the raw scores to obtain scores on a scale between 0 and 100 (transformed scores of the scale).

For each dimension, the items were coded, summed, and transformed into a scale ranging from 0 (the worst health status for that dimension) to 100 (the best health status)[16].

The statistical analysis was performed using Jamovi software. Numerical and categorical variables were expressed as the mean (standard deviation [SD]) and as percentages, respectively. In addition, to determine the normality of the sample, the non-parametric Shapiro-Wilk test was applied. A significance level of 5% was set.

To determine the relationship between quality of life and proton pump inhibitor treatment, the mean difference was estimated using the Student's *t*-test for paired samples in variables with a normal distribution. For variables with a non-normal distribution (physical function, physical role, general health, social function, and emotional role), the Wilcoxon signed-rank test was used. Additionally, to assess the relationship between treatment and changes in the RSI, GETS, and RFL, the difference in medians for pai-

red samples was estimated using the Wilcoxon signed-rank test, as these variables had a non-normal distribution. This was done by comparing the scores from the questionnaires before and after initiating PPI treatment.

RESULTS

Finally, 35 patients were available for analysis. Of these, 77.1% (n = 27) were women. The mean age was 55.2 years (SD: 14.5). The mean scores of all RSI items significantly decreased statistically. On the one hand, the severity of symptoms such as throat clearing, occasional or paroxysmal cough, and the sensation of a lump or needle in the throat showed the greatest reduction after treatment. On the other hand, symptoms such as dysphonia or other voice issues, as well as difficulty swallowing, showed the least change by the end of the treatment (**Table 1**).

When evaluating the GETS scale, scores decreased considerably across all assessed symptoms. The difference was statistically significant for all items except for "swelling in the throat." The symptoms that showed the greatest reduction in severity were the sensation of discomfort in the throat, the amount of time spent thinking about the throat, phlegm in the throat, and the constant urge to swallow (**Table 2**).

Regarding the endoscopic findings of the patients after antisecretory treatment, the most frequent observation was the presence of erythema/hyperemia in the larynx limited to the arytenoids, in 57.1% of patients. Only 8.6% (n = 3) had a positive RFS score (>7 points) for laryngopharyngeal reflux, indicating that imaging abnormalities are not necessarily required to determine the presence of the symptom. One does not exclude the other (**Table 3**).

The SF-36 dimension with the highest score prior to treatment was physical functioning, with a mean of 50.8, followed by social functioning, with a score of 49.1. The lowest scores were observed in the physical role and emotional role dimensions, with scores of 25 and 24, respectively. An increase was observed in all SF-36 subscales after treatment, and in five out of the eight dimensions, the differences reached statistical significance (bodily pain, vitality, social functioning, emotional role, and mental health) (**Table 4**).

DISCUSSION

The present study predominantly included female patients (77%), with a mean age of 55.2 years (± 14.5). The mean age among women was 52.3 years, while among men it was 65 years, reflecting an earlier and more frequent presentation in females. This finding is consistent with most reports in the global literature, which describe a higher prevalence in women, as observed in the studies by Drossman et al., Thompson et al., and Harvey et al.[2–4]. However, a higher percentage of arterial hypertension (HTN) and diabetes mellitus (DM) was found in this sample. This can be partially explained by the older mean age of the study population compared to other studies, in which the average age ranges from 45 to 52 years[17–19].

The most prevalent medical histories in the sample were, in order, HTN, tobacco use, type 2 DM, and alcohol consumption. Contrary to current assumptions, this study

Table 1. RSI Symptom Scale Differences Before and After Proton Pump Inhibitor Treatment

RSI scale items	Pretreatment	Posttreatment	Difference	*p*
Dysphonia or other voice problem	1.9	1.1	-0.8	0.001
Clearing of the throat	3.2	1.7	-1.5	<0.001
Presence of excessive mucus in the throat or postnasal drip	2.3	1.4	-0.9	0.001
Difficulty swallowing food, liquids or pills	1.6	0.8	-0.8	0.002
Coughing after eating or lying down	1.5	0.6	-1.0	0.001
Feeling of choking or obstruction	2.2	1.1	-1.1	<0.001
Occasional or paroxysmal cough	2.3	1.1	-1.3	<0.001
Sensation of a lump or a needle in the throat	3.2	1.8	-1.4	<0.001
Retrosternal burning, chest pain, indigestion, sour regurgitation	2.0	1.0	-1.0	<0.001

Table created by the authors.

Table 2. Difference in GETS Scale Item Scores Before and After Treatment

Symptom of the GETS scale	Pretreatment	Posttreatment	Difference	*p*
Sensation of having something stuck in the throat	2.6	1.6	-1.1	<0.001
Sore throat	2.2	1.3	-0.9	0.005
Throat discomfort/irritation	2.9	1.3	-1.6	<0.001
Difficulty swallowing food	1.7	0.7	-1.0	<0.001
Sensation of throat closing	1.8	1.0	-0.8	0.009
Swelling in the throat	0.9	0.6	-0.3	0.208
Phlegm in the throat	3.1	1.4	-1.7	<0.001
Cannot clear throat when swallowing	2.2	1.3	-0.9	0.004
Constant urge to swallow	2.9	1.2	-1.7	<0.001
Food sticks when swallowing	1.4	0.6	-0.8	0.002
How much time do you spend thinking about your throat?	4.5	2.3	-2.2	<0.001
At the moment, how annoying do you find the sensation in your throat?	4.9	2.5	-2.4	<0.001

Table created by the authors.

found that only a small percentage (5.7%) of patients had a history of diagnosed depression or anxiety. According to various authors, psychiatric disorders such as depression, generalized anxiety, and panic disorder may be present in up to 44% of patients with globus pharyngeus[20]. Moreover, in Rasmussen's study, 84% of participants presented with anxiety, mainly related to fear of having cancer[18].

After evaluating reflux-related symptoms, the sensation of throat clearing was identified as the most severe symptom, followed by the sensation of a "lump" or "needle" in the throat. These discomforts often overlap with and are easily confused with the general symptom of globus pharyngeus, making it difficult to establish a specific diagnosis of laryngopharyngeal reflux. Such a diagnosis would require additional diagnostic tools, such as esophagogastroduodenoscopy or 24-hour esophageal pH monitoring, to differentiate these pathologies[21]. Patients in this cohort did not report typical symptoms of gastroesophageal reflux disease, which are usually common in that condition, such as a history of chronic gastritis, heartburn, sour regurgitation, or chest pain[22,23]. This may be explained by the fact that patients were recruited from an otolaryngology clinic, where it is less common for referred individuals to present with predominantly gastroesophageal symptoms.

Patients' perceived quality of life was low from the beginning of the study. Most reported a fair health status that had remained the same or worsened over the past year. This finding is consistent with the literature, such as the study by Harris et al. on stressful life events and the onset of globus pharyngeus[20], in which patients with globus pharyngeus reported more discomfort and more stressful life events during the two months prior to symptom onset compared to controls. These findings support the idea that emotional disorders may play a causal role in the onset of globus pharyngeus rather than being a consequence of the symptom.

Moreover, regarding their physical health, patients in the present study reported reduced work performance and limitations in carrying out daily activities. With respect to emotional problems, they reported doing less than they would like to, experiencing pain that interfered with work-related tasks during the past month, and feeling exhausted and fatigued over the past week. Notably, nearly half of the patients reported being less careful in carrying out their job duties, difficulty engaging in social activities due to low mood, and nervousness. These findings are supported by previously published studies, such as that by Dr. Järvenpää[11], in which patients with globus pharyngeus had lower quality-of-life scores at their initial otolaryngology consultation. These findings are relevant because they highlight the connection between globus pharyngeus and impairment in key areas of the patient's life, particularly in their occupational and emotional well-being.

The literature describes that patients who do not show significant symptom improvement despite treatment with

Table 3. Endoscopic Findings on the RFS Scale

Findings	Score	Frequency	Percentage
Subglottic edema	Absent	33	94.3
	No information	2	5.7
Ventricular obliteration	Absent	33	94.3
	No information	2	5.7
Erythema/ hyperemia	Absent	9	25.7
	Arytenoids only	20	57.1
	Diffuse	4	11.4
	No information	2	5.7
Edema of vocal folds	Absent	29	82.9
	Mild	1	2.9
	Moderate	3	8.6
	No information	2	5.7
Diffuse laryngeal edema	Absent	13	37.1
	Mild	11	31.4
	Moderate	8	22.9
	Obstructive	1	2.9
	No information	2	5.7
Granuloma/ granulation tissue	Absent	32	91.4
	Present	1	2.9
	No information	2	5.7
Thick endolaryngeal mucus	Absent	25	71.4
	Present	8	22.9
	No information	2	5.7

Table created by the authors.

Table 4. Difference of the Subscales of the SF-36 Quality of Life Survey Before and After Treatment

Quality of life aspect	Pre-	Pos-	Difference	*p*
Physical function	50.8	54.3	3.5	0.116
Physical role	25	28.6	3.6	0.262
Bodily pain	47.7	54.9	7.2	0.027
General health	47.1	49.5	2.4	0.166
Vitality	44.3	55.5	11.2	0.003
Social function	49.1	58.6	9.5	0.029
Emotional role	24.8	34.7	9.9	0.02
Mental health	43.4	49.9	6.5	0.029

Table created by the authors.

PPIs often have an underlying, uncontrolled anxiety disorder[24]. Although only two patients (5.7%) in this study had a prior diagnosis of anxiety or depression, the average emotional role score on the quality-of-life scale was significantly reduced. This finding suggests a probable underdiagnosis of psychiatric conditions among patients with globus pharyngeus, who may also benefit from referral to and treatment by psychology or psychiatry specialists. It should be noted that no validated scales were used in this study to objectively diagnose anxiety or depression in the participants.

When analyzing quality-of-life scores based on patient self-perception, the domains that showed statistically significant improvement after treatment with PPIs were bodily pain, vitality, social functioning, emotional role, and mental health. No other studies were found that specifically evaluated changes in quality of life following antisecretory treatment in patients with globus pharyngeus. However, there are studies assessing quality-of-life changes in patients with gastroesophageal reflux disease after PPI treatment, such as the study by Aanen et al., in which the most notable improvements after treatment were observed in emotional role and vitality[25].

Regarding the improvement in RSI-assessed symptoms, all showed statistically significant improvement. The most notable improvements were in occasional coughing after eating (66% improvement), throat clearing (52%), and the sensation of a lump or needle in the throat (56%), which were the most severe symptoms reported by patients before treatment. Prior to initiating PPI therapy, the mean RSI score was 20.3 points, and 26 out of 35 patients (74%) had an RSI above 13 points, a threshold considered suspicious for laryngopharyngeal reflux[13]. After treatment, the mean RSI score was 10.6 points. Very similar data were found in a recently published study by Boom et al.[15] in which their patients with globus pharyngeus had a mean RSI score of 18.8 points at baseline, with 76% of patients having a score greater than 13, and a post-treatment RSI score of 10.3 points after two months of PPI therapy.

Regarding symptom improvement on the GETS scale, the most consistently responsive symptoms were "wanting to swallow all the time," "phlegm in the throat," "throat discomfort," and "the sensation of having something stuck." As for the endoscopic findings prior to antisecretory treatment, evaluated using the Reflux Finding Score (RFS), the most relevant signs observed were: erythema/hyperemia in the larynx and mild to moderate diffuse laryngeal edema in more than half of the patients; thick laryngeal mucus in approximately 25% of the patients; and mild to moderate edema of the vocal folds in just over 10%. However, only three patients (9%) had a positive RFS score for laryngopharyngeal reflux, despite all of them reporting symptoms of globus pharyngeus. This suggests that a negative RFS result does not rule out the presence of the symptom nor the potential benefit of antisecretory treatment. The mean RFS score in this study was 3.6 points, which contrasts with findings in the literature, such as in the study by Dr. Boom et al.[15], where the mean score was 5 points and 25% of the patients had a positive RFS score for laryngopharyngeal reflux prior to treatment.

In the literature, the Reflux Finding Score (RFS) has been reported to have a sensitivity of 87.8% and a specificity of 37.5% for detecting patients with pharyngeal reflux, as confirmed by the reference standard, which is pH monitoring[26,27]. Shilpa et al. found in their study that the RSI and the RFS were complementary and showed a strong correlation with the diagnosis of laryngopharyngeal reflux. They also concluded that after three months of treatment with PPIs, 70% of their patients showed improvement in the RFS[28]. This association between the presence of globus pharyngeus and signs suggestive of laryngopharyngeal reflux could be further clarified through larger studies that include a greater number of patients and hospital centers. It is also important to consider that the RFS is a subjective assessment and may show interobserver variability, which could account for differences found between studies. In patients who do not show improvement in symptoms with antisecretory treatment, it is also essential to evaluate for functional voice disorders, as several studies have described a causal relationship between these two pathologies[29,30].

In this study, a generic quality of life scale such as the SF-36 was used, which may have limited the precise evaluation of some important aspects of quality of life in these patients. However, there is currently no specific questionnaire available to assess quality of life in globus pharyngeus, and the scale used has already been widely validated in other pathologies. Moreover, a potential placebo effect or Hawthorne effect from the treatment with PPIs cannot be ruled out, considering that patients had a low prevalence of typical gastroesophageal reflux symptoms, low scores on the RFS scale, and, additionally, the absence of a control group.

CONCLUSIONS

PPI treatment was associated with improved symptoms and quality of life in patients with globus pharyngeus. Randomized controlled studies are needed before generalizing these results.

LIMITATIONS

Although globus pharyngeus is a common symptom in otolaryngology consultations, the sample size in this study is relatively small due to the strict exclusion criteria used, aimed at reducing biases from comorbidities and treatments with PPIs or other medications that could affect the results. It should be noted that there is no specific questionnaire to assess the quality of life of patients with globus pharyngeus. Therefore, other physical, emotional, or social disorders unrelated to the condition may interfere with the improvement or worsening of the patients' perceived quality of life in this study.

Finally, since this is a study on globus pharyngeus, no objective test, such as pH monitoring, was conducted to confirm or rule out the presence of gastroesophageal or laryngopharyngeal reflux in the patients. Instead, the diagnostic algorithm suggested by Zerbib et al. was followed, where patients with globus pharyngeus and no alarm esophageal symptoms underwent laryngoscopy and started a therapeutic trial with PPIs[31].

REFERENCES

1. Delaine E, Asimakopoulos A, Avagnina A, Hallak B, Bouayed S. Dysphagia with no obvious cause: globus pharyngeus. Revue Medicale Suisse. 2022;18(803);2121-2125. https://doi.org/10.53738/REVMED.2022.18.803.2121
2. Drossman D, Li Z, Andruzzi E, Temple R, Talley N, Grant-Thompson W, et al. U. S. Householder survey of functional gastrointestinal disorders - Prevalence, sociodemography, and health impact. Dig Dis Sci. 1993;38(9):1569-80. https://doi.org/10.1007/BF01303162
3. Harvey P, Theron B, Trudgill N. Managing a patient with globus pharyngeus. Frontline Gastroenterol. 2018;9(3):208-212. https://doi.org/10.1136/flgastro-2017-100844

4. Thompson W, Heaton K. Heartburn and globus in apparently healthy people. Can Med Assoc J. 1982;126(1):46-8.
5. Fukuhara T, Matsuda E, Ogawa A, Donishi R, Koyama S, Fujiwara K. Use of cervical ultrasonography in globus sensation investigation: a retrospective cohort study. Yonago Acta Medica. 2021;64(4):360-363. https://doi.org/10.33160/yam.2021.11.007
6. Deary IJ, Wilson JA, Kelly SW. Globus pharyngis, personality, and psychological distress in the general population. Psychosomatics. 1995;36(6):570-577. https://doi.org/10.1016/S0033-3182(95)71614-0
7. Penović S, Roje Ž, Brdar D, Gračan S, Bubić A, Vela J, et al. Globus Pharyngeus: A Symptom of Increased Thyroid or Laryngopharyngeal Reflux? Acta Clin Croat. 2018;57(1):110-115. https://doi.org/10.20471/acc.2018.57.01.13
8. Webb CJ, Makura ZG, Fenton JE, Jackson SR, McCormick MS, Jones AS. Globus pharyngeus: a postal questionnaire survey of UK ENT consultants. Clin Otolaryngol Allied Sci. 2000;25(6):566-9. https://doi.org/10.1046/j.1365-2273.2000.00386.x
9. McCall WV, Athanasiadi A, Bowie C, Rosenquist PB. Major Depressive Disorder in the Older Adult Associated With Globus Pharyngeus and Weight Loss - An Indication for Electroconvulsive Therapy. Am J Geriatr Psychiatry. 2022;30(2):235-239. https://doi.org/10.1016/j.jagp.2021.10.010
10. Khan MR, Saha M, Mamun MA, Salam KS, Chowdhury MS, Haque MM, et al. Upper GIT Endoscopic Evaluation and Psychological State Assessment of Patients with Globus Sensation. Mymensingh Med J. 2019;28(2):405-409.
11. Järvenpää P, Laatikainen A, Roine R, Sintonen H, Arkkila P, Aaltonen L. Symptom relief and health-related quality of life in globus patients: a prospective study. Logop Phoniatr Vocology. 2019;44(2):67-72. https://doi.org/10.1080/14015439.2017.1397741
12. Hamilton NJI, Wilcock J, Hannan SA. A lump in the throat: laryngopharyngeal reflux. BMJ. 2020;371:m4091. https://doi.org/10.1136/bmj.m4091
13. Kavookjian H, Irwin T, Garnett JD, Kraft S. The Reflux Symptom Index and Symptom Overlap in Dysphonic Patients. Laryngoscope. 2020;130(11):2631-2636. https://doi.org/10.1002/lary.28506
14. Takahashi N, Mori K, Baba H, Sasaki T, Ohno M, Ikarashi F, et al. Reliability and validity of the Japanese version of the Glasgow Edinburgh Throat Scale (GETS-J): Use for a symptom scale of globus sensation. Auris Nasus Larynx. 2018;45(5):1041-1046. https://doi.org/10.1016/j.anl.2018.02.001
15. Boom L, Edens M, Rinia B. Reflux finding score and reflux symptom index as potential predictors for proton pump inhibitor response in globus pharyngeus patients: A prospective study. Auris Nasus Larynx. 2020;47(4):609-615. https://doi.org/10.1016/j.anl.2020.02.002
16. Von E, Altman D, Egger M, Pocock S, Gøtzsche P, Vandenbroucke J. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. J Clin Epidemiol. 2008;61(4):344-9. https://doi.org/10.1016/j.jclinepi.2007.11.008
17. Siupsinskiene N, Adamonis K, Toohill R, Sereika R. Predictors of response to short-term proton pump inhibitor treatment in laryngopharyngeal reflux patients. J Laryngol Otol. 2008;122(11):1206-12. https://doi.org/10.1017/S0022215108001898
18. Rasmussen ER, Schnack DT, Ravn AT. A prospective cohort study of 122 adult patients presenting to an otolaryngologist's office with globus pharyngeus. Clin Otolaryngol. 2018;43(3):854-860. https://doi.org/10.1111/coa.13065
19. Bouchoucha M, Girault-Lidvan N, Hejnar M, Mary F, Airinei G, Benamouzig R. Clinical and psychological characteristics of patients with globus. Clin Res Hepatol Gastroenterol. 2019;43(5):614-622. https://doi.org/10.1016/j.clinre.2019.01.006
20. Harris M, Deary I, Wilson J. Life events and difficulties in relation to the onset of globus pharyngis. J Psychosom Res. 1996;40(6):603-15. https://doi.org/10.1016/0022-3999(96)00024-4
21. Fuchs HF, Müller DT, Berlth F, Maus MK, Fuchs C, Dübbers M, et al. Simultaneous laryngopharyngeal pH monitoring (Restech) and conventional esophageal pH monitoring-correlation using a large patient cohort of more than 100 patients with suspected gastroesophageal reflux disease. Dis Esophagus. 2018;31(10). https://doi.org/10.1093/dote/doy018
22. Chen J, Brady P. Gastroesophageal reflux disease: pathophysiology, diagnosis, and treatment. Gastroenterology Nursing. 2019;42(1):20-28. https://doi.org/10.1097/SGA.0000000000000359
23. Massawe WA, Nkya A, Abraham ZS, Babu KM, Moshi N, Kahinga AA, et al. Laryngopharyngeal reflux disease, prevalence and clinical characteristics in ENT department of a tertiary hospital Tanzania. World J Otorhinolaryngol Head Neck Surg. 2020;7(1):28-33. https://doi.org/10.1016/j.wjorl.2020.04.009
24. Poovipirom N, Ratta-apha W, Maneerattanaporn M, Geeratragool T, Chuenprapai P, Leelakusolvong S. Treatment outcomes in patients with globus: A randomized control trial of psychoeducation, neuromodulators, and proton pump inhibitors. Neurogastroenterol Motil. 2023;35(3):e14500. https://doi.org/10.1111/nmo.14500
25. Aanen MC, Weusten BL, Numans ME, de Wit NJ, Samsom M, Smout AJ. Effect of proton-pump inhibitor treatment on symptoms and quality of life in GERD patients depends on the symptom-reflux association. J Clin Gastroenterol. 2008;42(5):441-7. https://doi.org/10.1097/MCG.0b013e318074dd62
26. Powell J, Cocks HC. Mucosal changes in laryngopharyngeal reflux--prevalence, sensitivity, specificity and assessment.

Laryngoscope. 2013;123(4):985-91. https://doi.org/10.1002/lary.23693
27. Horvath L, Hagmann P, Burri E, Kraft M. Evaluation of Oropharyngeal pH-Monitoring in the Assessment of Laryngopharyngeal Reflux. J Clin Med. 2021;10(11):2409. https://doi.org/10.3390/jcm10112409
28. Shilpa C, Sandeep S, Chandresh S, Grampurohit A, Shetty TS. Laryngopharyngeal Reflux and GERD: Correlation Between Reflux Symptom Index and Reflux Finding Score. Indian J Otolaryngol Head Neck Surg. 2019;71(Suppl 1):684-688. https://doi.org/10.1007/s12070-018-1480-7
29. Shires CB, Dewan K. Is there Really a Lump in My Throat? The Incidence and Implication of Vocal fold Abnormalities in Patients Presenting with Globus. J Voice. 2024;38(6):1419-1423. https://doi.org/10.1016/j.jvoice.2022.05.008
30. Hamdan AL, Khalifee E, Ghanem A, Mansour H, Yammine E. Predictive value of globus pharyngeus in patients with functional dysphonia versus organic dysphonia. Laryngoscope. 2019;129(4):930-934. https://doi.org/10.1002/lary.27493
31. Zerbib F, Rommel N, Pandolfino J, Gyawali CP. ESNM/ANMS Review. Diagnosis and management of globus sensation: A clinical challenge. Neurogastroenterol Motil. 2020;32(9):e13850. https://doi.org/10.1111/nmo.13850