

Relationship between Gastroesophageal Reflux Disease and Salivary pH: A Simple Outpatient Method in Patients with Chronic Cough.

Original Article

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ABSTRACT

Background: Gastroesophageal reflux disease (GERD) is the most prevalent digestive system disorder and has been associated with more than one atypical presentation, one of the most common presentations is chronic cough (CC) and due to atypical or silent GERD, this chronic cough is not responding to treatment and hence become a refractory chronic cough (RCC). Salivary pH reduction has been linked to GERD.

Objective: This research aims to diagnose persistent cough due to gastroesophageal reflux by the use of salivary pH, Gerd Q, and CDQ questionnaires.

Methodology: Eighty patients were involved in this prospective cross-sectional study at outpatient chest clinic of Ain Shams University Hospitals from June 2023 to March 2024. the detection of gastroesophageal reflux chronic cough was done by using combined GERD Q questionnaire, CDQ questionnaire with salivary pH –indicator strips.

Results: The present study involved 80 patients with chronic cough lasting >8 weeks. The Salivary pH test was done for all patients provides that 73 % (58) patient with acidic salivary pH (pH <6), while 27% with normal salivary pH (pH > 6.8). Comparison between both Gerd Q and CDQ for presence of GERD and acidic pH was highly significant (with *P value* < 0.001). The ROC curve shows that the best cut off point for salivary pH to differentiate between chronic cough patients with GERD and chronic cough patients without GERD was ≤6.5 with sensitivity of 88.46%, specificity of 72.09 % and area under the curve (AUC) of 0.787.

Conclusion: Usage of salivary pH strip indicator is considered simple, fast, easy, for detection of gastroesophageal reflux chronic cough combined with GERD Q questionnaire, CDQ questionnaire.

Key Words: Chronic cough, gastroesophageal reflux disease, saliva, salivary pH.

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INTRODUCTION

Coughing is a defense mechanism that helps keep the lower respiratory tract safe from aspiration, infections, and irritations. However, it can become problematic when it misses the mark and stops a person from reacting appropriately to harmful substances^[1]. After a while, a persistent and severe cough might become pathological since it interferes with daily life^[2]. A low QOL is linked to CC, which is characterized as a persistent cough that lasts more than eight weeks and occurs every day^[3].

As a major detriment to patients' quality of life (QoL), chronic cough ranks high among the most prevalent symptoms that prompt medical attention^[4]. About 10-12% of the global population suffers from a persistent cough. Chronic cough affects also sleep quality and work of patient^[5].

It should come as no surprise that GERD can affect other lung illnesses, produce chronic cough (CC), and potentially precipitate asthma^[6]. According to research, a kind of gastroesophageal reflux disease known as gastroesophageal reflux chronic cough (GERC) is a leading cause of CC^[7].

Healthcare providers can utilize the Gerd Q to diagnose and manage GERD without referring patients to specialists or performing endoscopies because it has a sensitivity of 65% and a specificity of 71%, which is comparable to the results obtained by gastroenterologists^[8]. Both the GERD Q and the CDQ were shown to be easier to grasp and respond by patients, with the former detecting more GERD symptoms in overweight and obese individuals.

Salivary pH and volume abnormalities have been associated with GERD and laryngo-pharyngeal reflux (LPR) symptoms in numerous studies^[9]. Salivary pH decreased before GERD treatment and increased following disease control, showing a statistically significant difference^[10]. Salivary pH testing is quick, cheap, and non-invasive; it also provides a local acidity reading^[11].

ETHICAL CONSIDERATION

Data collection was started after approval confirmed by ethical committee from the Institutional Research Board (IRB) in Ain Shams University in accordance of research ethics with number of FWA 000017585 at 12-2-2023. Data confidentially maintained and data were taken from all participants who were assigned the consent.

MATERIALS AND METHODS

Study Design and participant:

This cross-sectional prospective study was performed from June 2023 to March 2024, included eighty patients who attended the outpatient chest clinic of Ain Shams University Hospitals.

The inclusion criteria: Patients ≥ 18 years old, complaining of chronic cough which is diagnosed as cough lasting more than 8 weeks in an adult^[12].

Patient who complains of upper GIT symptoms (typical reflux symptoms, as heartburn, indigestion, chest discomfort, throat clearing, dysphonia, dysphagia and belching and/or characteristics of cough triggered by phonation, rising, lying, eating and certain foods intake^[13]

The exclusion criteria: Patients previously diagnosed with diagnosed with upper or lower respiratory disease especially sinusitis, chronic obstructive pulmonary disease (COPD), bronchial asthma, interstitial lung disease (ILD), patients with radiology that can explain the cause of cough, former smokers, diseases of the salivary glands, myocardial infarction, massive pulmonary embolism, patients on antihypertensive drugs, malignancies of the larynx and pharynx, those who were unwilling to participate and patients on proton pump inhibitors or H2 blockers.

Every participant had detailed history (Age, sex, non-smokers or light smokers as less than 10 cigarettes per day), a complete clinical examination including measures such as body mass index calculation. Diagnostic investigation, including chest radiograph and spirometry were done.

All patients were assessed by the GERD Q and CDQ questionnaires (Questions were asked by the doctor)^[14].

Gerd Q1				
Questionnaire for patients with upper gastrointestinal symptoms				
Important: To answer this questionnaire, take only the last 7 days (1 week) into account and answer each question by filling in one square per question.				
	Never	1 day	2 to 3 days	Between 4 and 7 days
1. In the last week, how many days have you had a burning sensation or burning pain in your chest?	☐	☐	☐	☐
2. In the last week, how many days have you noticed that the contents of your stomach have come up into your throat or mouth?	☐	☐	☐	☐
3. In the last week, how many days have you felt pain in the pit of your stomach?	☐	☐	☐	☐
4. In the last week, how many days have you been nauseated or felt like throwing up?	☐	☐	☐	☐
5. In the last week, how many nights have you had trouble sleeping well because of burning pain or because your stomach content has come into your throat or mouth?	☐	☐	☐	☐
6. In the last week, how many days have you taken medication other than what your doctor prescribed (such as Almax, Fruit salts, or Rennie chewable tablets) for burning pain or because your stomach content has come into your throat or mouth?	☐	☐	☐	☐

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Carlsson-Dent Questionnaire	
1. Which of the following sentences best describes your main complaint? Mark an option.	+5 burning sensation or burning pain that starts in the pit of your stomach or chest and goes up into your throat (heartburn) 0 nausea or vomiting +2 pain in the middle of your chest when you eat 0 none of the above
2. Which of the following sentences best describes the time at which you have the complaint? Mark an option.	-2 at any time and there is no relation to eating (neither improves or worsens with meals) +3 within the first 2 hours after eating 0 always occurs at the same time of day or night and is not related to eating
3. What happens to your complaint in the following situations: does it get worse, get better, or nothing happens? Read each sentence and circle what happens to your main complaint	- You eat a lot or more than you are accustomed to +1 -1 0 - You eat fatty foods +1 -1 0 - You eat spicy or very seasoned foods +1 -1 0
4. What happens to your main complaint when you take antacids? Mark an option	0 nothing +3 complete relief within the first 15 minutes of having taking them 0 complete relief 15 minutes after taking them 0 I don't take antacids
5. What happens to your main complaint when you bend over or lie down? Mark an option	0 nothing +1 it gets worse or the activity causes it -1 it gets better 0 I don't know
6. Which of the following options best describes the effect that carrying heavy things, straining, or doing anything strenuous has on your main complaint?	0 no effect +1 it gets worse or the activity causes it -1 it gets better 0 I don't know or I don't do strenuous things
7. If you regurgitate (the food in your stomach returns to your throat), what happens to your main complaint?	0 nothing +2 it gets worse or the regurgitation causes it -1 it gets better 0 I don't know or I don't regurgitate

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Fig. 1, 2: GERD Q and CDQ questionnaires.

Salivary pH measurement:

After a one-hour fast, the saliva was collected in the outpatient chest clinic. At least one hour before their scheduled session, patients were told not to use any mouthwash or brush their teeth. The patients were asked to sit quietly for 15 minutes without swallowing saliva and were told not to put anything from their noses in their mouths. The test strips are single-use. The procedure entails taking saliva from the collection cup, inserting a salivary pH test strip, waiting 10 seconds, and then comparing the resulting colour to the testing chart that comes with the kit. The pH 0-14 Universal indicator strips (Merck KGaA, Frankfurt, Germany) are utilized. The pH Universal indicator kit comes with a testing chart, instructions and pH test strips. pH values above 6.8 correspond to healthy saliva, whereas values between 6.6 and 6 were characterized as moderately acidic, and values below 6 as highly acidic.



Fig. 3: pH indicator strip.

Statistical analysis:

Version 27 of IBM's Statistical Package for the Social Sciences (SPSS) was used for data entry once data was amended, coded, and collected. The data was parametric, the means, standard deviations, and ranges were shown. To determine if a variable follows a normal distribution, one can apply the one-sample Kolmogorov-Smirnov test. When an expected count in a given cell is less than 5, a Chi-square test and/or a Fisher exact test are used to compare the groups' qualitative data. Two groups were compared using separate t-tests for quantitative data with parametric distributions and the Mann-Whitney U test for non-parametric distributions. To determine the degree of association between two group-specific quantitative variables, we utilized Spearman correlation coefficients. An acknowledged margin of error of 5% and a confidence interval of 95% were both established. Given that the *p-value* was less than 0.05, it was deemed significant.

RESULTS

Demographic data of the study group

The present study involved 80 patients with chronic cough lasting >8 weeks on daily basis, the mean age of the studied patients was 48.56 ± 19.15 with most patients of males 46 patients (57.5%) than females 34 (42.5%). BMI mean was 30.21 kg/m^2 . Results obtained of salivary pH were 5.99 ± 0.91 as illustrated in (Table 1).

Table 1: Demographic characteristics and laboratory data of the studied patients.

Parameters	Studied patients (N=80)	
Sex	Male	46 (57.5%)
	Female	34 (42.5%)
Age	Mean $\pm$ SD	48.56 ± 19.15
BMI	Mean $\pm$ SD	30.21 ± 6.4
Obesity	Non-obese	33 (41%)
	Obese	47 (59%)
Salivary pH	Mean $\pm$ SD	5.99 ± 0.91

SD: standard deviation; BMI: body mass index

Distribution of chronic cough patient with and without GERD by combined GERD Q and CDQ Questionnaires

Patients in the study group completed both the GERD Q and CDQ Questionnaires to diagnose GERD, and based on their findings, we discovered that 47 (59%) had chronic cough with GERD and 33 (41%) had chronic cough without GERD. Then the salivary pH test was performed to all patients, indicating that 46 (98%) of those diagnosed with GERD via the GERD Q and CDQ Questionnaires displayed acidic salivary pH (<6). Additionally, 12 (36.4%) of the patients diagnosed with chronic cough without GERD also demonstrated acidic salivary pH (<6).

Comparison between distribution of chronic cough patient with & without GERD by both GERD Q, CDQ Questionnaires and salivary pH was showing highly statistically significance with (*P value* <0.001) (Table 2).

Table 2: Distribution of chronic cough patient with & without GERD by combined GERD Q, CDQ Questionnaires and salivary pH.

		Chronic cough Patient without GERD by GERD Q & CDQ	Chronic cough Patient with GERD by GERD Q & CDQ	Test value	P-value	P-value
		No. = 33	No. = 47			
Salivary Ph	Mean $\pm$ SD	6.56 $\pm$ 0.95	5.59 $\pm$ 0.62	5.561•	0.001	HS
	Range	4 – 7	4 – 7			
Chronic cough Patient with ACIDIC Salivary pH		12 (36.4%)	46 (98%)			
Chronic cough Patient with Normal Salivary pH		21 (63.6%)	1 (2%)	37.337*	0.001	HS

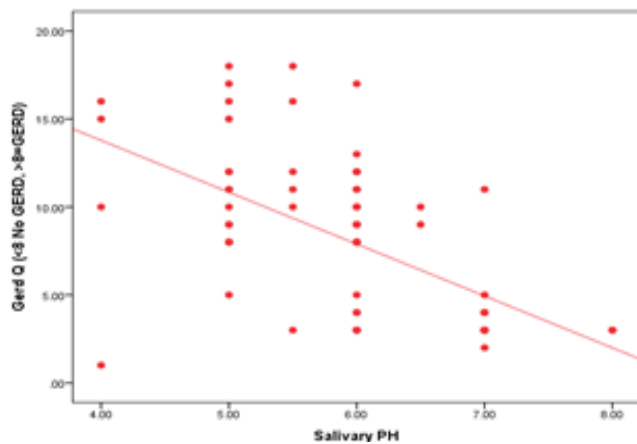
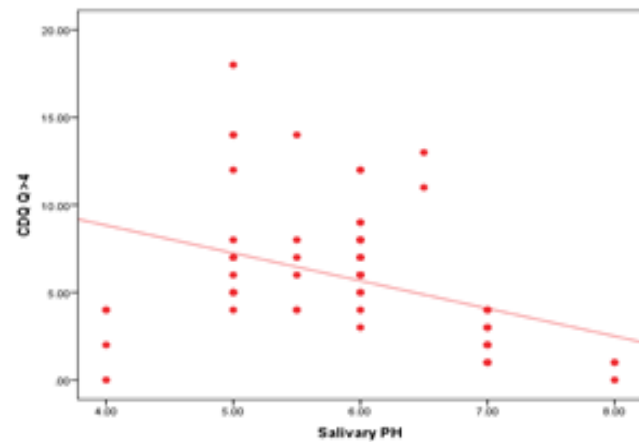
P-value > 0.05: Non significant; *P-value* < 0.05: Significant; *P-value* < 0.01: Highly significant

*: Chi-square test; •: Independent t-test; GERD: Gastroesophageal Reflux Disease; GERD Q: Gastroesophageal Reflux Disease Questionnaire; CDQ: Carlsson Dent Questionnaire; HS: Highly significant.

Spearman Correlation between Questionnaires and salivary pH with the other studied parameters.

Spearman Correlation was conducted to examine the relationship between each of GERD Q, CDQ Q Questionnaires and salivary pH with the other studied

parameters. Acidic salivary pH showed a negative correlation with GERD Q and CDQ Q Questionnaires ($r = -.604$, $r = -.457$) respectively, which was statistically significant ($p < 0.001$) (Figure 4, 5), GERD Q Questionnaire showed a positive correlation with CDQ Q Questionnaires ($r = .590$) with ($p < 0.001$) (Table 3).

**Fig. 4:** Correlation between GERD Q Questionnaire and Salivary pH among the studied patients.**Fig. 5:** Correlation between CDD Q Questionnaire and Salivary pH among the studied patients.**Table 3:** Spearman correlation between each of GERD Q, CDQ Q Questionnaires and salivary pH with the other studied parameters.

	GERD Q Questionnaire		CDQ Q Questionnaire		Salivary PH	
	R	P-value	R	P-value	r	P-value
GERD Q Questionnaire	—	—	.590**	0.000	-.604**	0.001
CDQ Q Questionnaire	.590**	0.001	—	—	-.457**	0.001
Salivary PH	-.604**	0.001	-.457**	0.000	—	—
Age	-0.010	0.927	-0.032	0.775	-0.025	0.829
Weight /kg	0.042	0.713	0.062	0.584	-0.090	0.428
Height /cm	0.045	0.690	-0.069	0.545	-0.063	0.579
BMI >29.9=obesity	0.047	0.680	0.118	0.296	-0.128	0.258

P-value > 0.05: Non significant; *P-value* < 0.05: Significant; *P-value* < 0.01: Highly significant

Spearman correlation coefficient

Receiver operating characteristic (ROC) curve analysis of the diagnostic value of salivary pH

Receiver operating characteristic curve (ROC) for for salivary pH to differentiate between chronic cough patients with GERD and chronic cough patients without GERD (table 4). The ROC curve showed that the best cut off point for salivary pH to differentiate between chronic cough patients with GERD and chronic cough patients without GERD was ≤ 6.5 with sensitivity of 88.46%, specificity of 72.09 with PPV of 79.3 and NPV of 83.8 and AUC of 0.787 (Figure 6).

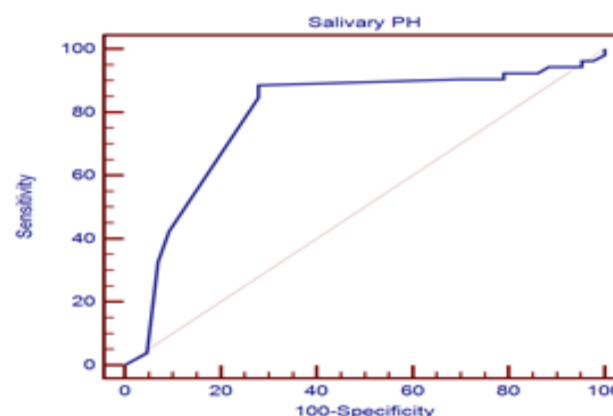


Fig. 6: ROC for for salivary pH to differentiate between between chronic cough patients with GERD and chronic cough patients without GERD.

Table 4: ROC for salivary pH to differentiate between between chronic cough patients with GERD and chronic cough patients without GERD.

	Cut off point	AUC	Sensitivity	Specificity	PPV	NPV
salivary pH	≤ 6.5 *	0.787	88.46	72.09	79.3	83.8

AUC: Area under curve; PPV: Positive predictive value; NPV: Negative predictive value

DISCUSSION

One of the most debilitating symptoms that might lead a patient to seek medical attention is a persistent cough, which can impact their social and psychological lives. The physician has to exclude several risk factors as a cause of CC (such as COPD, GERD, asthma and postnasal discharge), so CC is forming a burden on health system^[15]. Among the most common causes of CC on several guidelines is GERD^[16].

GERD and cough can affect and aggravate each other, which cause refractoriness of treatment in both conditions^[17]. Thus, we need to identify GERD as a cause of CC. The present study showed that 59% of the studied patients complain of GERD (47 patients out of 80) as the study of *Y. Kanemitsu et al., 2019* who demonstrated that GERD symptoms were present in over 50% of patients suffering with subacute or CC^[18].

Eighty patients were randomly studied which sought medical advice at chest outpatient clinic complain of CC where demographic data was taken and analyzed that show 57.5 % males (46 patients) and 42.5 %were females (34 patients).

Imran Satia et al; 2022^[19] found a similar result, with a higher proportion of males overall the study with percentage of males with prevalent CC (53%). While studies by Copenhagen^[20] and Rotterdam^[21] found a little female majority, this finding contradicts that finding and is in line with research from South Korea^[22] and China^[23], which found no female predominance of CC. Despite the

fact that females outnumber males in CC clinics by a margin of about 2:19, the reason why females are more prevalent in cough clinics and clinical trials could be because females experience more severe and frequent coughing, which can have a bigger impact on their QOL^[24,25]. Additionally, most patients diagnosed with GERD were female, and referrals to clinics may be prompted by socioeconomic factors, such as co-occurring anxiety, sadness, and mood disorders.

According to previous research, CC is more common in middle-aged and older adults; our study's median patient age of 48 years is consistent with this finding^[26-28].

Measurements of height and weight were taken, and a BMI of 30.1 kg/m² was determined. Obesity increases the likelihood of experiencing GERD symptoms. Research has demonstrated that the likelihood of alleviating GERD symptoms improves 1.5-2.4 times for every 3.5 kg/m² reduction in BMI^[29]. Therefore, it appears that GERD is more common in the obese population.

A high suspicion for GERD as the etiology of CC must be maintained^[30]. It could be challenging to diagnose GERD. Several non-invasive methods for diagnosing GERD have been devised. Among these instruments that permit an impartial evaluation of symptoms are questionnaires^[31]. For a more accurate assessment, validated cough questionnaires could be helpful. Gerd Q has a number of benefits over other diagnostic questionnaires, including its ease of use, its ability to measure the frequency and intensity of symptoms, and its inclusion of a QoL scale for evaluating the effects of the disease. For the purpose of diagnosing GERD in primary

care settings, the validated Spanish version of the Gerd Q questionnaire is helpful. As a favourable outcome, a cut-off point must be greater than or equal to 8^[32].

A positive outcome on the Spanish version of the CDQ^[33] is defined as a score of 4 or higher. Take a look at this survey to find out what causes GERD symptoms and what sets them off. In our study 47 patients were diagnosed as having GERD with both questionnaires. We used both questionnaires to increase sensitivity and specificity of the combined results of both questionnaires.

Investigating and diagnosing esophageal dysmotility or reflux in CC cannot be done with a single, conclusive test. Although high-resolution 24-hour esophageal manometry is the gold standard, it can be costly and isn't always accessible, particularly in outpatient and tertiary care settings^[34]. Because endoscopy is relied upon to rule out GERD as a reason, CC may go undiagnosed despite the fact that barium swallow and gastroscopy are not as sensitive as manometry for reflux illness. This is because some individuals with GERD symptoms have normal endoscopy findings^[35].

So, studies have to search for a simple method to identify those patients with GERD among patients complain of distressing CC especially those at primary care units and out patients' clinics. Research has consistently shown that abnormalities in salivary volume and pH are associated with GERD symptoms^[36]. The purpose of our study was to determine whether there is an association between saliva pH and two questionnaires used to diagnose GERD in patients who have CC. In primary care settings in particular, this test has the potential to diagnose GERD.

The sensitivity of salivary pH test in our study was 88.46% and the specificity of 72.09 with PPV of 79.3 and NPV of 83.8. The cut-off point of salivary pH test was ≤ 6.5 . When compared to the normal range, the acidic salivary pH values of the GERD group were significantly higher than those of the no GERD group. There was high statistical significance of salivary PH testing results in comparison of both group of GERD and no GERD when combined to GERD Q and CDQ Questionnaires in both groups

Some experts showed that there is a correlation between salivary pH and the amount and value of esophageal pH as by *Caruso et al.*^[37], people with GERD had a lower saliva pH than healthy persons (6.5 vs. 4.9 on average) so, in order to examine a presumptive diagnosis of GERD, we must consider a salivary pH at or below 5.

As study by *Bechir et al.*^[38], that showed that GERD has effects on the salivary parameters, as the saliva pH. Also, *Sujatha et al.*^[39] who conclude that a significantly lower mean pH value of 6.65 was found in the GERD group compared to control group.

In study by Yousif and Taghreed^[40], the mean of salivary pH in the GERD group was 6.95 and in the control group was 7.11. In the GERD group, lower salivary pH values were found compared with the control group which is matched with our study results.

Recent studies in patients with LPR have shown a reduction in the salivary pH of these patients when compared to normal individuals without the disease^[41]. It was also noticed that there is a positive correlation between the presence of laryngopharyngeal symptoms and a reduction both in volume and in saliva pH in LPR patients. According to these studies, it is possible to establish a correlation between the presence of oesophageal reflux measured through 24h oesophageal pH-metry and this reduction in salivary volume and pH^[42].

CONCLUSION

Salivary pH strip indicator is considered as simple, fast, easy, inexpensive and non-invasive methods for detection of GERD in chronic cough patients; combined with GERD Q questionnaire and CDQ questionnaire.

LIMITATIONS

The present study exhibits certain limitation. First, the study was conducted at single centre. Further issues with interpreting results can arise from the limited sample size and the absence of a control group.

RECOMMENDATIONS

We suggest that patients with chronic cough who are suspected of having GERD could have their salivary pH tested as part of their clinical evaluation. Additionally, we advise employing salivary pH testing in conjunction with GERD Q and CDQ questionnaires, pH-indicator strips pH 0-14 Universal indicator, and patients who continue to cough despite the absence of GERD symptoms.

AUTHORS CONTRIBUTION

We declare that all listed authors significantly contributed to the research design, data collection, analysis, and interpretation, creating or editing the paper. We further state that no one who qualifies for authorship has been excluded.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

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LIST OF ABBREVIATIONS

ACE: Angiotensin converting enzyme
 AUC: area under the curve
 BMI: Body mass index
 CC: chronic cough
 COPD: obstructive pulmonary disease
 CDQ: Carlsson Dent Questionnaire
 GERD: Gastroesophageal Reflux Disease
 GERD Q: Gastroesophageal Reflux Disease Questionnaire
 GERC: Gastroesophageal Reflux Chronic Cough
 SPSS: Statistical Package for Social Science
 IQR: Inter-quartile range
 ILD: interstitial lung disease
 MII- pH: Multichannel intraluminal impedance and pH monitoring
 LPR: Laryngeal pharyngeal reflux
 QoL: Quality of life
 RCC: Refractory chronic cough
 ROC: roc operating curve.

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العلاقة بين ارتجاع المرئ و درجة الحموضة اللعابية: طريقة مبسطة في العيادات الخارجية للمرضى الذين يعانون من كحة مزمنة

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المقدمة: الكحة المزمنة تعرف في البالغين بانها الكحة التي تستمر لثمان اسابيع او أكثر. وتكون الكحة المزمنة غير مستجيبة للعلاج الأساسي. الكحة المزمنة الان تم فهمها كخلل في التنظيم العصبي. هذه الكحة المزمنة ينتج عنهما عبء مرضي خطير وغالبا تكون صعبة التشخيص. تشخيص الكحة المقاومة المزمنة وعلاجها غالبا مايتأخر لسنوات عديدة لان الاسباب المسببة للكحة المزمنة يجب استبعادها اولاً ثم التدرج في طرق العلاج المبدئية. لذا فانه هناك حاجة ملحة لتشخيص وعلاج الكحة المزمنة المقاومة للعلاج والتي تستهدف اليات المرض الاساسية. العلاج الحالي للكحة له دور بسيط وغير مجدي غالبا وعلينا ان نبذل جهود أكثر لتشخيص اسباب الكحة لعلاج الاسباب نفسها.

وجد في احدي الدراسات ان درجة الحموضة اللعابية قبل وبعد علاج الارتجاع مع زيادة قيمة الاس الهيدروجيني بعد علاج المرض. درجة الحموضة اللعابية للمرضى الذين يعانون من ارتجاع المرئ هو أكثر حمضية من الحموضة اللعابية بدون مرض في الجهاز الهضمي، حيث القيم كانت طبيعية. يمكن قياس درجة الحموضة اللعابية وتعد طريقة اقل سريعة وقليلة التكلفة.

يمكن استخدام استبيان وجود الارتجاع Gerd Q بالمئة لتشخيص ارتجاع المرئ بواسطة اخصائي علاج الجهاز الهضمي، لذا فان استبيان GerdQ هو غالبا اداة مفيدة لممارس طب الاسرة والجهاز الهضمي والصدر وغيره من متخصصي الرعاية الصحية لتشخيص وعلاج مرض ارتجاع المرئ بدون التحويل في البداية لاستشاري في منازير الجهاز الهضمي. استبيان ارتجاع المرئ GQ يظهر عدد اكبر من اعراض ارتجاع المرئ في المرضى ذوو الوزن المرتفع او السمنة واستبيان CDQ يعتبر اسهل للمرضى للفهم والاجابة. من العجيب انه يوجد فقط ٢٠ بالمئة اجماع بين الاستبيانين، والذي يفترض انهما فقط مهمان لمعرفة اعراض ارتجاع المرئ في اناس مختلفين.

الدراسة كانت تهدف: الى تقييم التأثير المشترك لدرجة الحموضة اللعابية، استبيان ارتجاع المرئ Gerd Q و CDQ في تشخيص ارتجاع المرئ للمرضى الذين يعانون من كحة مزمنة.

المرضى وطرق البحث: دراسة مستعرضة تمت في عيادة الصدر الخارجية بمستشفى عين شمس الجامعي بجامعة عين شمس. لمدة ستة اشهر في الفترة من يونيو ٢٠٢٣ وحتى مارس ٢٠٢٤. على المرضى أكثر من ١٨ عاما والذين كانوا يعانون من كحة لثمان اسابيع او أكثر للكشف عن وجود ارتجاع المرئ كسبب للكحة المزمنة مع استخدام الحموضة اللعابية و استبيان Gerd Q و CDQ.

النتائج: الدراسة تمت على ٨٠ من المرضى مع قياس درجة الحموضة اللعابية لكل المرضى والتي اظهرت ٧٣٪ من المرضى (٥٨) مريض مع حموضة للعب اقل من ٦ و ٢٧٪ من المرضى مع حموضة طبيعية للعب.

وكانت نتائج الاستبيان مع شريط درجة حموضة اللعاب ذات قيمة احصائية. مع درجة حموضة اقل من ٦,٥ للفرقة بين مرضى الكحة المزمنة مع وبدون حموضة.

لذا فان استخدام شريط قياس نسبة حموضة اللعاب يعتبر سهل، سريع لاكتشاف ارتجاع المرئ في مرضى الكحة المزمنة مع الاستبيان المستخدم.