How Significant pH Study in Diagnosis of Symptomatic Patients in Saudi Community: A Cohort Study

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ABSTRACT

Background: The study of pH levels is crucial in diagnosing symptomatic patients, providing insight into metabolic imbalances and gastrointestinal disorders. Evaluating pH variations helps health professionals make more precise treatments, improving health outcomes and proper interventions.

Aim: Present study aims to explore the role of pH monitoring in symptomatic patients diagnosed within the Saudi population and its worth in differentiating nonspecific symptoms. The focus of this study is to discuss the connection between clinical symptoms, chronic diseases, and pH DeMeester scores to increase the diagnostic sensitivity for GERD.

Methodology: A cohort observational study was conducted on a simple random sample of 130 participants, aged 18 to 70, recruited from a gastroenterology medical centre in Riyadh between June and July 2021. Sociodemographic and clinical data were collected, including associations of symptoms and chronic diseases with pH scores.

Results: Among 130 participants, 63.8% had GERD, 36.9% had IBS, and 92.3% reported dyspepsia. High pH DeMeester scores were observed in 37.7% of participants, while 41.5% had normal scores and 20.8% severe. Statistical analysis revealed no significant association between pH scores, clinical symptoms, or chronic diseases, highlighting diagnostic mismatches in 75.5% of cases.

Conclusion: These findings underscore the complexity of GERD diagnosis and the need for objective measures beyond symptom-based assessments.

Keywords: pH study, Saudi community, symptomatic patients.

INTRODUCTION

Gastroesophageal reflux disease (GERD), which impacts a significant portion of the global population, is among various gastrointestinal ailments that can be more accurately detected using pH testing. As reported by Alotaibi et al., 2023a, the prevalence of this, based on local surveys, is approximately 28.7 percent. The nonspecific chest discomfort, heightened regurgitation, nausea, and heartburn symptoms in GERD patients can be elucidated through the measurement of their pH levels [1]. Acid reflux can now be precisely identified using pH monitoring. Diagnosing gastroesophageal reflux disease (GERD) is essential to avert complications such as Barrett's esophagus, erosive esophagitis, and esophageal stricture [2]. Patients with positive endoscopic findings do not derive benefits from pH monitoring, however. In cases where symptoms persist post-treatment or a conclusive diagnosis cannot be established, pH monitoring becomes critical significance. In such instances, pH measurement is essential for diagnosis [3]. When conventional treatment approaches prove ineffective, pH monitoring may offer critical insights for subsequent management strategies. Modern methods for reflux disorder diagnosis are typically based on patient histories, barium studies, or endoscopic procedures. The tools are useful but do not always establish the severity or incidence of reflux disease [4]. pH monitoring is a useful adjunct to the technique as it can accurately measure acid levels and the symptoms that accompany them. Clinicians can enhance the management and treatment outcomes, minimize the risk of complications, and improve the quality of life for patients by including pH monitoring in diagnostic procedures. Hence, pH level monitoring is a critical component of the evaluation of GERD and associated conditions [3]. This study critically reviews the role of pH monitoring in diagnosing symptomatic individuals in the Saudi population.

This study investigates the role of pH levels in symptom identification, shows that monitoring pH levels can effectively evaluate individuals with symptoms, and establishes a relationship between the appearance of symptoms and pH level fluctuations. To enhance the quality of detection, it highlights patient classification based on pH levels and explores the relevance of pH monitoring data for patient care and therapy. This study attempts to show how pH level assessments can impact the enhancement of symptom relief and care for patients through the evaluation of these factors.

LITERATURE REVIEW

Acid reflux disease has been a longstanding element of gastroenterological clinical evaluations. The DeMeester score facilitates the differentiation of the distinct symptomatology of GERD from similar clinical conditions such as dyspepsia and IBS by

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evaluating esophageal acid exposure via prolonged pH monitoring [5]. This well-validated exam may have limits in populations with various clinical presentations and overlapping symptoms, according to some study.

Alsaleem (2021) indicates that regurgitation, heartburn, and chest pain exhibit overlap. The frequency of GERD in Saudi Arabia has been reported to be as high as 45% in certain studies [3]. It was suggested that, in alignment with regional epidemiological trends, a more specialized diagnostic instrument is required [6]. pH investigations are objective; yet, their relationship with chronic disease symptoms and severity may be more reliable and predictable [7]. Lifestyle factors, such as diet, the obesity epidemic, and smoking, can significantly influence GERD. Research underscores the need of understanding local risk factors, alongside region-specific clinical guidelines and diagnostic instruments, for improved illness management [8].

There are concrete sociodemographic and lifestyle determinants for GERD, IBS, and other gastrointestinal diseases in Saudi Arabia. Trends for increasing incidence are obesity, smoking, and dietary habits that increase the prevalence rate of GERD. A typical presentation of GERD is dyspepsia in more than 60% of the patients presenting with symptoms of GERD [9]. IBS also is prevalent in this region and often overlaps with GERD. The literature review shows that diagnosis devices based on objective criteria like pH are not well studied in primary care settings, and empirical treatment with PPI still dominates the scene [8].

Even chronic diseases such as diabetes mellitus and hypertension mar the symptomatology in Saudi Arabia, muddling the clinical picture. Studies show that filling up this diagnostic pathway gap requires studies tailored to a population; furthermore, to determine how the cultural, genetic, and environmental contributions interlink within the GERD's pathophysiology [10]. Upcoming GERD diagnostics evolve on combining pH monitoring along with other techniques like impedance studies and high-resolution manometry for further determination of esophageal functions [11]. Although extensive literature demonstrates its increased necessity, in Saudi Arabia, it remains underutilized mostly due to financial and accessibility constraints [12].

Studies on pH monitoring in symptomatic patients need to be more robust regarding the correlation between objective pH data and subjective reports of symptoms, especially in populations with a high incidence of nonspecific symptoms such as dyspepsia and chest discomfort [13]. Other research findings include variation in standardizing criteria among different populations for the DeMeester scores [14]. Although pH monitoring is handy for identifying acid reflux, its utility for nonacid reflux diagnosis and symptomatology mixed with it is limited. An important question will be to see how the adaptive Saudi healthcare systems evolve with this new diagnostic tool tailored appropriately to the needs of its population [7].

An early detection approach through pH analysis is required, considering the rapid population growth and the increasing prevalence of noncommunicable diseases. Chronic diseases, such as diabetes, hypertension, and kidney disease, are strongly associated with pH imbalances [5]. Such imbalances would be detectable early, allowing for early intervention [13]. Metabolic acidosis is the early sign of diabetic ketoacidosis and can easily be screened by simple pH tests. Early detection of such abnormalities allows doctors to alter medicines and prescribe lifestyle changes before complications set in to cause severe damage that can lead to hospitalization or permanent destruction [12].

Additionally, Saudi Arabia is a nation with a high prevalence of lifestyle diseases such as obesity and cardiovascular diseases that make it a preventive medicine country. Monitoring of pH urine, blood, and gastric fluids will monitor the risk factors before these conditions advance to a severe state [12]. For example, an imbalance in pH levels may point to a kidney disease that requires early intervention to reduce the progression of the disease [15]. Keeping track of the pH level among such populations, especially those with chronic diseases, will help develop a health plan and will save healthcare systems [11].

This would imply that pH is of utmost importance as a tool for diagnostic purposes in the symptomatic patient, especially by the rampant prevalence of diseases such as obesity, diabetes, and cardiovascular conditions seen in Saudi Arabia. The diets are very high in terms of carbohydrate and fat in-take and low exercises, creating the best environment metabolic diseases may flourish [16]. Metabolic acidosis and alkalosis are conditions that can be diagnosed with simple pH determinations because these imbalances affect the pH within the human body. With a good understanding of how these fluctuations in pH relate to several diseases common among Saudi citizens, diagnoses become more accurate, and proper treatment plans are made [12]. In Saudi Arabia, for example, diabetes is very common and, consequently, metabolic acidosis can arise from poorly controlled diabetes, especially diabetic ketoacidosis.

Likewise, esophageal pH levels could be markedly altered by such prevalent disorders that accompany obesity such as sleep apnea and gastro-esophageal reflux disease (GERD). These conditions are intensified by the frequent high-fat diet, thus increasing acid reflux attacks. Thus, it follows that pH monitoring will be both diagnostic and therapeutic because interventions may be tailored using monitoring of illness progression as well as effectiveness of therapy [15]. Sedentary lifestyles and the increased prevalence of smoking raise the risk factors for acid-base imbalances among the population. This is why there is a need for periodic pH testing by primary care practitioners [16].

The relationship between dietary habits, metabolic diseases, and pH fluctuations highlights the need for public health initiatives that promote healthier lifestyle choices [15]. With pH as a simple, yet cost-effective diagnostic marker, health practitioners can now strengthen the approach of early detection and intervention and consequently, ensure better outcomes. Many of these imbalances can be prevented if the Saudi community is given preventive care measures and tailored therapy [16]. Research on pH in this region of Saudi Arabia is also justified based on sociocultural reasons. There should be studies conducted on the monitoring of pH in the healthcare setup concerning lifestyle diseases. GERD is one of the most common gastrointestinal diseases in Saudi Arabia [15].

Esophageal pH monitoring is essential for diagnostic purpose. This is especially relevant to current empirical proton pump inhibitor (PPI) treatments, as pH information is often insufficient. This leads to inadequate patient care and risks associated with diagnosis. More recently, there is a weak association between the pH DeMeester scores and clinical outcomes as seen in patients suffering from comorbid illnesses, including irritable bowel syndrome and dyspepsia. It is very essential to conduct further studies in order to establish this multifactorial interaction. This lack of population-based studies taking into account the sociodemographic profile, lifestyle factors, and chronic diseases prevalence makes the existing disparities even worse in Saudi Arabia. Present study fills gaps by reviewing the role of pH monitoring in diagnosing persons with symptoms. This diagnostic procedure needs to be specially tailored for the population in Saudi Arabia, as well as explains the interconnection of symptoms with chronic disease and pH levels.

METHODOLOGY

Study Design

Research employed simple random sampling to ensure that the study's participants accurately represented the cohort. Data was collected in a gastroenterology clinic in Riyadh, Saudi Arabia, during June and July of 2021. In symptomatic individuals, we sought to ascertain the association between pH DeMeester scores and various clinical symptoms and conditions.

Inclusion Criteria

The selected participants ranged in age from 18 to 70 years and exhibited gastrointestinal symptoms suggestive of GERD, dyspepsia, or IBS. Eligibility necessitated prior pH monitoring testing and the ability to provide informed consent.

Exclusion Criteria

The exclusion criteria included patients under 18 or over 70 years of age, individuals with a prior surgical history involving the esophagus or stomach, and those with significant comorbidities that could compromise symptom interpretation. Patients unable to provide consent and those with incomplete or inconsistent data in the pH study were omitted from the analysis.

Ethical Consideration

The study followed strict guidelines for ethical research. Participant identity was ascertained to be anonymous by anonymizing all identifiable information so that the participant data remains confidential and used only for research purposes. Informed consent was obtained from all participants, and participants respected the right to withdraw at any time during the study. Institutional review board approval was obtained regarding the ethical clearance to conduct the current study.

RESULTS

Sociodemographic and Clinical Characteristics:

The mean age was 37.8 years, SD: 10.3. In terms of gender, there was a distribution of 43.8% female, n = 57, and 56.2% male, n = 73. Average BMI recorded a reading of 27.1, SD: 5.6, reflecting a moderately overweight population. Regarding chronic diseases, most participants have one, 76.9%. The prevalence of cases without chronic disease was 23.1%. Chronic diseases reported in this study were asthma, DM, GERD, fatty liver, UC, IBD, HTN, high lipids, renal failure, obesity, and psychiatric disorders. Due to clinical importance, GERD and IBS alone were selected for further detailed analysis. GERD was reported by 63.8% of the cohort, while 36.2% of the population remained free of the condition. IBS was reported among 36.9% of the cohort, while another 63.1% were free of the disorder. Smoking status showed 13.1% among the participants who smoked, a majority of whom (84.6%) were classified as non-smokers, but none of the participants reported their alcohol consumption. As far as drug use is concerned, 68.5% were on GERD drugs, and their reported drugs are Gastrozole, Gaviscon, Lansoprazole, Motilium, Moxal, Nexium, Rabezole, Omeprazole, among other unspecified PPIs.

Among the populations, multiple drugs were also documented, and at one point in time, surgical history was reported in 17.7% of the population. It measured symptoms such as heartburn, chest pain, nausea/throwing, bloating, anxiety, breathlessness, coughing, and indigestion; among the symptoms measured, the most common one was an indigestion symptom reported at 92.3%, with the PH scores for DeMeester high prevalence scores in 37.7% with an expected outcome of 41.5%, but an extremely poor prevalence in 20.8%; no attempt has been made to discuss clinical findings and interpretations of such results.

The table further highlighted that most participants did not report other gastrointestinal symptoms besides dyspepsia. In general, this overview can give an idea of the demographic and health profile of the study cohort, thus pointing out a high prevalence of GERD and IBS, significant medication use, and the prominent presence of dyspepsia and surgical histories among participants. These findings explain why these chronic gastrointestinal diseases and their risk factors among such patients should be treated. Table 1 summarizes the sociodemographic and clinical characteristics analyzed in 130 patients.

Grouping of Participants Based on GERD Symptoms and pH Study Results

As illustrated in Table 2, the study categorized participants into three groups based on the results of the GERD symptoms and the pH study. Among the 110 patients who qualified for this grouping, 16 (14.5%) complained of GERD symptoms coupled with GERD, as observed in pH study findings. Majorities were found to complain of GERD symptoms where a pH study confirmed the GERD diagnosis could not be reached in 83 (75.5%). On the other hand, 11 patients (10.0%) reported no GERD symptoms, but their pH studies were positive for GERD. This distribution shows that clinical symptoms and diagnostic data are a significant mismatch.

Where most of the subjects, 75.5%, had symptoms of GERD, objective evaluation using the pH study did not show support for GERD as a diagnosis but instead noted a general trend for symptom overlap with varied diagnoses or overreliance on symptom-based diagnosis. However, the minority group of 10.0% did have a completely different scenario whereby no symptoms were reported, but diagnosis based on pH findings suggested a GERD, an asymptomatic or atypical GERD. Few patients (14.5%) demonstrated agreement between symptomatology and pH study diagnosis. Such findings indicate a complex interrelation between symptomatology and objective measures for diagnosis in evaluating GERD. These findings underscore the necessity to have a closer combination of clinical assessment with diagnostic testing, as reliance on symptoms alone leads to either over or underdiagnosis of GERD. The significance of such knowledge includes having a tailored approach toward diagnostic strategies and management plans for correctly identifying and treating GERD among different populations.

Association of pH DeMeester Scores with Symptoms and Chronic Diseases

Of ex-smokers, 66.7% were classified as having a high pH DeMeester score, whereas 33.3% had a standard score. There were no severe scores recorded for ex-smokers. In control patients, pH DeMeester scores were distributed evenly into the high, regular, and severe groups. However, there was no statistically significant association between smoking status and pH DeMeester scores because it only resulted in $p = 0.519$. Also, the prevalence of chronic diseases was not statistically related to pH DeMeester scores as well. The pH DeMeester scores among patients with chronic and without chronic diseases showed parallel distribution of high, standard, and severe scores. For GERD, respectively, the distribution of scores in participants was 34.0% high scores, 42.6% standard scores, and 23.4% severe scores, showing no significant difference between GERD and non-GERD participants. Similarly, no association was identified between IBS and IBD participants, as trends were similar ($p > 0.05$).

Table 1. Sociodemographic and Clinical Characteristics of the Participants

Sociodemographic and Clinical Characteristics			Mean	Standard Deviation	Count	Table N %
Age			37.8	10.3		
Gender		Female			57	43.8%
		Male			73	56.2%
BMI			27.1	5.6		
Smoking		Ex-Smoker			3	2.3%
		No			110	84.6%
		Yes			17	13.1%
Alcohol		No			130	100.0%
Chronic Disease		No			30	23.1%
		Yes			100	76.9%
Specific Chronic Diseases	GERD	No			47	36.2%
		Yes			83	63.8%
	IBS	No			82	63.1%
		Yes			48	36.9%
	IBD (Crohn's/UC)	No			128	98.5%
		Yes			2	1.5%
Drug History	Taking GERD Medications	No			41	31.5%
		Yes			89	68.5%
	Taking Analgesic	No			129	99.2%
		Yes			1	0.8%
Surgical History	Previous Surgical History	No			107	82.3%
		Yes			23	17.7%
	Cholecystectomy	No			126	96.9%
		Yes			4	3.1%
Symptoms	Heart Burn	No			130	100.0%
	Chest Pain	No			129	99.2%
		Yes			1	0.8%
	Nausea/Vomiting	No			77	59.2%
		Yes			53	40.8%
	Flatulence	No			102	78.5%
		Yes			28	21.5%
	History of Anxiety	No			37	28.5%
		Yes			93	71.5%
	Shortness of Breath	No			120	92.3%
		Yes			10	7.7%
	Cough	No			120	92.3%
		Yes			10	7.7%
	Dyspepsia (Barium)	No			10	7.7%
		Yes			120	92.3%
pH DeMeester Score		High			49	37.7%
		Normal			54	41.5%
		Severe			27	20.8%
Total					130	100.0%

Table 2. Categorization of Participants Based on Clinical Symptoms and pH Study

		Count	Table N %
Groups	GERD Symptoms + GERD on pH Study	16	14.5%
	GERD Symptoms (But no GERD on pH Study)	83	75.5%
	No GERD Symptoms but Positive on pH Study	11	10.0%

History of previous surgeries, like cholecystectomy, and medication or intake of drugs for GERD or pain medication were not related to scores of pH DeMeester at p-value >0.05. It also emphasized that most symptoms analyzed were not associated with pDeMeester. These consisted of chest and heartburn pains, nausea/ vomiting, bloating, flatulence, history of anxiety, breathlessness, cough, and upper gastrointestinal dysfunction or barium dyspepsia.

However, flatus trended towards significance with high pH DeMeester scores in 57.1% of those with flatus compared with 32.4% of those without flatus ($p = 0.051$). Therefore, isolated factors, including symptoms, chronic disease, or pharmacologic exposure, generally fail to correlate strongly with pH DeMeester scores. Thus, these results postulate that the score may portray a complex relationship among conditions that do not depend on unique clinical variables for diagnosis.

Table 3. Association of pH DeMeester Score with Symptoms and Chronic Diseases, including GERD

			pH DeMeester Score						
			High		Normal		Severe		P value
			Count	Row %	Count	Row %	Count	Row %	
Smoking		Ex-Smoker	2	66.7%	1	33.3%	0	0.0%	0.519
		No	42	38.2%	43	39.1%	25	22.7%	
		Yes	5	29.4%	10	58.8%	2	11.8%	
Alcohol		No	49	37.7%	54	41.5%	27	20.8%	-
Chronic Disease		No	13	43.3%	10	33.3%	7	23.3%	0.593
		Yes	36	36.0%	44	44.0%	20	20.0%	
Specific Chronic Disease	GERD	No	16	34.0%	20	42.6%	11	23.4%	0.771
		Yes	33	39.8%	34	41.0%	16	19.3%	
	IBS	No	35	42.7%	28	34.1%	19	23.2%	0.101
		Yes	14	29.2%	26	54.2%	8	16.7%	
	IBD (Crohn's/UC)	No	48	37.5%	53	41.4%	27	21.1%	1.000
		Yes	1	50.0%	1	50.0%	0	0.0%	
Surgical History	Past Surgical History	No	39	36.4%	45	42.1%	23	21.5%	0.872
		Yes	10	43.5%	9	39.1%	4	17.4%	
	Cholecystectomy	No	46	36.5%	53	42.1%	27	21.4%	0.427
		Yes	3	75.0%	1	25.0%	0	0.0%	
Drug History	Taking GERD Medications	No	12	29.3%	21	51.2%	8	19.5%	0.307
		Yes	37	41.6%	33	37.1%	19	21.3%	
	Taking Analgesic	No	49	38.0%	53	41.1%	27	20.9%	1.000
		Yes	0	0.0%	1	100.0%	0	0.0%	
Symptoms	Heart Burn	No	49	37.7%	54	41.5%	27	20.8%	-
	Chest Pain	No	48	37.2%	54	41.9%	27	20.9%	0.585
		Yes	1	100.0%	0	0.0%	0	0.0%	
	Nausea/Vomiting	No	29	37.7%	31	40.3%	17	22.1%	0.921
		Yes	20	37.7%	23	43.4%	10	18.9%	
	Flatulence	No	33	32.4%	47	46.1%	22	21.6%	0.051
		Yes	16	57.1%	7	25.0%	5	17.9%	
	Hx of Anxiety	No	17	45.9%	10	27.0%	10	27.0%	0.101
		Yes	32	34.4%	44	47.3%	17	18.3%	
	Shortness of Breath	No	47	39.2%	47	39.2%	26	21.7%	0.224
		Yes	2	20.0%	7	70.0%	1	10.0%	
	Cough	No	44	36.7%	52	43.3%	24	20.0%	0.328
		Yes	5	50.0%	2	20.0%	3	30.0%	
	Dyspepsia (Barium)	No	3	30.0%	4	40.0%	3	30.0%	0.767
		Yes	46	38.3%	50	41.7%	24	20.0%	
Total			49	37.7%	54	41.5%	27	20.8%	-

Fischer's Exact Test

Indeed, further investigation would be desired to establish other factors involved with the observed variability of the pH DeMeester score as a diagnostic tool for GERD. Table 3 analyzes the association of pH DeMeester score with smoking status, alcohol consumption, chronic disease, particular conditions (GERD et al.), surgical history, drug usage, and symptoms reported.

Table 3 was not correlated, neither for nor against those conditions linked with smoking, chronic diseases, GERD, IBS, IBD, a history of surgery, and drug intake. pH DeMeester scores were unassociated ($p > 0.05$). Also, it was uniformly spread in high, normal, and severe pH values. The closest result was flatulence with $p = 0.051$, which implied that the pH value was correlated and multivariant.

DISCUSSION

Diagnosing gastrointestinal illnesses, including dyspepsia, irritable bowel syndrome (IBS), and gastroesophageal reflux disease (GERD), necessitates a comprehensive understanding of pH levels. Due to cultural, gastronomic, and health disparities, pH monitoring is the definitive diagnostic standard in Saudi Arabia. This part discusses the importance of pH research about clinical symptoms; later sections will further explore this topic concerning patient treatment and health outcomes. In this case, the DeMeester score for pH monitoring has proven to be a dependable diagnostic instrument for GERD and associated conditions. It bridges the divide between patient-reported symptoms and conclusive diagnosis, transcending objective assessments of acid reflux occurrences. In the Saudi cohort under discussion, 37.7% exhibited elevated pH values, while a lesser proportion demonstrated severely pathogenic scores. This further substantiates the notion that acid exposure differs among individuals, underscoring the necessity for accurate diagnostic instruments such as pH monitoring rather than solely depending on patients' reports, which may not always be reliable [16].

A notable disparity existed between the outcomes of the pH analyses and the observed symptoms. Up to 10% of individuals with

asymptomatic pH readings may be identified using pH examinations, and around 75.5% of these individuals will exhibit symptoms of GERD. Consequently, pH testing may be used in the diagnostic evaluation process to enhance the precision of symptoms-based diagnosis. Given that cultural influences can affect Saudis' perception of symptoms, a pH study will ensure more objective diagnostic methodologies [16].

Gastroesophageal reflux disease (GERD) is intricate and often coexists with other gastrointestinal disorders such as dyspepsia and irritable bowel syndrome. An astonishing 92.3% of research participants exhibited dyspepsia, consistent with the condition's general frequency in the population. The concurrent occurrence of dyspepsia and GERD symptoms complicates clinical examinations. The manifestations of both illnesses, including heartburn, indigestion, and nausea, are analogous. Although numerous individuals displaying GERD symptoms were misdiagnosed due to symptom overlap, the pH analysis in the Saudi cohort indicated otherwise, underscoring the need for objective diagnostic methods [17].

Traditional Saudi cuisine and a preference for spicy meals are prevalent eating habits that may complicate the diagnosis of gastrointestinal disorders in Saudi patients. Despite being relatively low at 13.1%, smoking elevates the risk of GERD and exacerbates its symptoms. Due to these lifestyle and cultural factors, personalized diagnostic approaches are necessary, considering both patient-specific characteristics and objective outcomes from pH testing [12]. Incorporating pH monitoring into the diagnostic protocol would fundamentally alter the management of GERD and related illnesses.

According to Sandhu et al. (2018), over two-thirds of patients were already receiving treatment for GERD, with nearly all of these individuals on proton pump inhibitors (PPIs). Given the findings of the symptom-mismatch study, it is proposed that many persons may not receive adequate treatment or may be subjected to unnecessary interventions. Symptom-based diagnosis can lead to overmedication and divert attention from addressing the underlying causes of gastrointestinal distress [8]. Using pH monitoring could improve treatment accuracy in Saudi Arabia's healthcare systems, which progressively emphasise chronic conditions. Patients with positive results in pH-based GERD tests should have individualized treatment plans, including appropriate medication and behavioral changes Patients who remain symptomatic even after a pH test is negative may require evaluation for functional dyspepsia or psychosomatic symptoms [10].

The study revealed valuable information pertaining to the sociodemographic and clinical features of Saudi people, according to the findings of Islami et al. (2014) [2]. The population as represented by the sample of adults presenting with gastrointestinal symptoms. The sample is balanced evenly in terms of sex and has a mean age of 37.8 years. The fact that 76.9% of people reported experiencing chronic diseases shows the correlation between gastrointestinal problems and overall health issues such as diabetes, obesity, and mental health issues. This research explores the relationship between GERD and IBS as well as clinical and sociodemographic factors associated with gastrointestinal symptoms and chronic diseases [2]. The average age of the participants was 37.8 years (SD = 10.3), and even though women formed 43.8% of the sample, men were slightly higher at 56.2%. The average BMI was 27.1 (SD = 5.6).

This indicates a profile of varied weight in the sample. 76.9% of respondents reported at least one chronic disease. GERD and IBS are of special interest in this study. GERD was found to affect 63.8%, whereas IBS was found to affect 36.9% of the participants. Regarding medication, 68.5% of the respondents were on GERD-related medicines; in the management of GERD, the use of PPIs was high. Dyspepsia was the most common symptom, seen in 92.3% of participants, while other symptoms like heartburn, chest pain, nausea/vomiting, and flatulence were less common but all the way indicated that the experience of a symptom is much more diverse among the subjects with GERD [6].

The findings of this study suggest that pH monitoring should be integrated into a comprehensive diagnostic framework that accounts for comorbidities and their potential impact on gastrointestinal health. Diabetic gastroparesis may resemble GERD symptoms, complicating accurate diagnosis. Phosphorus research aids physicians in achieving improved diagnoses and more precise therapies by distinguishing between acid reflux and other gastrointestinal disorders. Emerenziani et al., (2008) emphasizes pH monitoring as a crucial diagnostic instrument, while simultaneously acknowledging the limits of existing methodologies. A scarcity of data on alcohol consumption, for example, complicates the ability to ascertain the lifestyle factors that predispose Saudis to GERD and other illnesses. The results could be specific to the region of Saudi Arabia if based on a single cohort from one gastrointestinal hospital in Riyadh [7]. The implications of these findings for the healthcare policy of Saudi Arabia are wide-ranging. The use of sophisticated diagnostic techniques, such as pH monitoring, could play a key role in the nation's drive toward better health care outcomes, as envisioned by Vision 2030.

Standardizing pH studies in symptomatic patients could yield improved patient outcomes, enhanced resource efficiency, and a reduction in diagnostic errors. This study will enhance public health activities focused on increasing awareness of GERD and associated illnesses [13].

SUMMARY FINDINGS

This study investigated the role of pH monitoring in diagnosing gastrointestinal disorders among 130 symptomatic patients in Saudi Arabia. The cohort, comprising 43.8% females and 56.2% males with a mean age of 37.8 years, showed a high prevalence of GERD (63.8%) and IBS (36.9%). Dyspepsia was the most common symptom (92.3%). Despite 37.7% of participants having high pH DeMeester scores, no significant correlation was found between pH scores, clinical symptoms, or chronic diseases, highlighting a diagnostic mismatch in 75.5% of cases. The findings emphasize the complexity of relying solely on symptoms for GERD diagnosis and underscore the need for objective diagnostic tools.

IMPLICATIONS

The findings highlight the need for integrating objective diagnostic tools, such as pH monitoring, with clinical evaluations to address diagnostic mismatches in GERD. Incorporating lifestyle and regional factors into diagnostic frameworks can enhance accuracy, improve treatment outcomes, and support the development of tailored healthcare strategies in Saudi Arabia. These advancements align with broader public health goals and the nation's Vision 2030 objectives for improving healthcare quality.

LIMITATIONS

This study was limited to a single-center cohort, restricting the generalizability of findings to other populations. The reliance on self-reported symptoms introduced subjectivity, and insufficient assessment of lifestyle factors like diet and smoking further constrained the analysis.

RECOMMENDATIONS

Future studies should include diverse populations and incorporate advanced diagnostic tools, such as impedance studies and high-resolution manometry. Emphasis should also be placed on examining lifestyle and cultural factors to refine diagnostic accuracy and management of GERD.

CONCLUSION

The results of this research study indicate the complexity of GERD and other gastrointestinal disorders; symptom-based diagnosis may sometimes be different from pH DeMeester scores or objective measures. Although several symptoms, such as flatulence, chronic conditions, smoking history, surgical history, and disease conditions like IBS, IBD, etc., exhibited a very high prevalence, none of them seemed to be correlated with any pH levels. That calls for multiple causes of GERD, with the problem of not being directly related to the extent of reflux. No direct association will also become wrong in subjective symptom assessments. Further integrated and sensitive measures need to be applied to diagnose this. Future work in GERD would include further variables contributing to pH scores. It would help refine diagnostic accuracy and optimal management approaches for GERD and other similar conditions in the gastrointestinal spectrum. Healthcare providers can provide more tailored treatments to patients by combining objective measures with clinical evaluation.

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