

Original Research Article

Vertigo in association with gastro-esophageal reflux disease

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Received: 24 March 2021

Revised: 05 April 2021

Accepted: 06 April 2021

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ABSTRACT

Background: Gastroesophageal reflux (GERD) is a condition which develops when the reflux of stomach contents cause troublesome symptoms. Symptoms of GERD are either esophageal: heartburn and regurgitation, or extra-esophageal: chronic cough, recurrent sinusitis, and globus sensation in the throat. One of the extra-esophageal manifestations of GERD is otitis media with effusion, very common among children. The aim of our study was to find the prevalence of GERD and *Helicobacter Pylori* (*H. Pylori*) among patients with peripheral vertigo.

Methods: The present descriptive study was conducted on randomly selected patients attending outpatient department (OPD) of in community health center, Chenani for a period of one year from August 2018 to July 2019. Patients were selected without the pathology of central nervous system for the further analysis.

Results: 85 (75.89%) patients had gastro-esophageal reflux disease. Tendency of GERD was found higher among females (54.12%). Positive *H. pylorus* was found for 21 patients (24.71%). 65 (74.71%) patients with vertigo positive had GERD. When acid refluxes into the upper GI system, it can affect the tubes that lead to the inner ear. When these tubes become irritated, swelling can occur, causing a loss of balance and common with GERD that occurs when lying down after a meal.

Conclusions: It present data confirms the hypothesis that one of the peripheral vertigo causes could be GERD, by way of a mechanism which may include reflux of gastric acids causing inflammation or local infection. The present study found a definite prevalence of GERD and *H. Pylori* among patients with peripheral vertigo.

Keywords: Gastro-esophageal reflux, Otitis media, Peripheral vertigo, *H. Pylori*

INTRODUCTION

Gastroesophageal reflux (GERD) disease is one of the most common gastrointestinal diseases across countries and all over the world. In order to define GERD, the authors of the Montreal classification relied heavily on symptoms and their effect on patients. Accordingly, GERD is a condition which develops when the reflux of stomach contents causes troublesome symptoms and/or complications.¹ Symptoms of GERD are subdivided into: esophageal (heartburn and regurgitation) and non-typical or extra-esophageal: chronic cough, hoarseness, recurrent

sinusitis, globus sensation in the throat, burning feeling on the tongue, dental erosion, and fullness. These symptoms are bound to affect patient's wellbeing and negatively influence quality of life.² Klauser et al have stated that heartburn and regurgitation are the mostly typical symptoms characterizing GERD, but in clinical practice, a large variety of esophageal and extra-esophageal symptoms are often reported.³ These extra-esophageal symptoms can occur with or without typical GERD. Occasional symptoms are found to occur in large part of population and are not considered affecting the quality of life, but frequent and severe symptoms could do so. It is very important for the physician to diagnose this early and

preventing it from causing further complications. One of the extra-esophageal manifestations of GERD is otitis media with effusion. It is most common among children, but some studies have found that GERD may directly cause or contribute chronic ear problems for children and adults.⁴ We hypothesize that one of the peripheral vertigo causes could be GERD, by mechanism including gastric acids directly irritate the mucosa and cause inflammation or *Helicobacter Pylori* (*H. Pylori*) could exist and cause local infection. The aim of our study was to find the prevalence of GERD and *H. Pylori* among patients with peripheral vertigo.

METHODS

The present descriptive study was conducted on randomly selected patients attending outpatient department (OPD) of in community health center, Chenani for a period of one year from August 2018 to July 2019. The study was conducted after taking approval from ethical committee. Simple random sampling method (probability sampling) with a set of few criteria to choose the participants was used in the present study. All the patients who complained about experiencing vertigo had an equal opportunity to be a part of the sample with this selection parameter.

A questionnaire was created and on the basis of which the patients were selected, and differentiate the cause of it. The questionnaire consisted of complaints and clinical examination to discard possibility of central origins of vertigo. Main symptoms for diagnosing peripheral vertigo are revealed in Table 2.

In our study we gathered information about GERD and assumed that patients had GERD when they have been diagnosed GERD using endoscopic examination or had GERD symptoms for at least twice a week and these symptoms impaired patients' quality of life (as per Genval guidelines 1999).

Inclusion criteria

Patients of all age groups and gender, but above 18 year of age, with peripheral vertigo symptoms like: tinnitus, nausea, vomiting, etc, were included, along with the patients' diagnosed using endoscopic examination or with GERD symptoms like heartburn, regurgitation, and pain.

Exclusion criteria

Patients below 18 years or with the pathology of central nervous system or with any other pathology except GERD, *H. Pylori* or upper respiratory tract infection (URTI), were excluded.

Patients, who were diagnosed GERD using the questionnaire, were found as to how many of them had peripheral vertigo. To find out the significance of GERD distribution among vertigo patients Chi-square test was

performed. We counted odds ratio to predict risk. The results were analyzed statistically using suitable software (MS Excel 2010 in this case).

RESULTS

Almost equal number of males and females formed the study group, while tendency of GERD was found higher among females (54.12%) (Table 1). Most of the vertigo symptoms, when present, were high on severity and duration and tinnitus present as well (Table 2).

Table 1: Main characteristics of studied group.

Characteristics	N (%)
Gender	
Male	54 (48.21)
Female	58 (51.79)
Age (years)	
<40	38
>40	74
Mean±SD (years)	58.2±3.6
Total	112

Table 2: Peripheral vertigo symptoms.

S. no.	Symptoms	Peripheral vertigo
1	Onset	Acute
2	Intensity	Severe
3	Duration	From few seconds to several hours
4	Induced by head position	Frequently
5	Tinnitus (ringing noise in the ear)	Present
6	Nausea and vomiting	Present (sometimes severe)
7	Other neurological signs	Absent

Table 3: Complains related to vertigo characteristics.

Characteristics	Vertigo (+ve)	Vertigo (-ve)
No. of patients	87	25
Age	59.1±3.9	57.8±3.3
Males	42 (48.28)	12 (48)
Females	45 (51.72)	13 (52)
Tinnitus (ringing noise)	76 (87.36)	0
Provocative factors		
Movement	79 (90.80)	0
Food and alcohol	9 (10.34)	0
URTI	8 (9.20)	0
With GERD	65 (74.71)	25 (100)
Without GERD	22 (25.29)	0
<i>H. Pylori</i> +ve	21 (24.14)	7 (28)

The results have shown that 85 (75.89 %) patients had gastro-esophageal reflux disease ($p < 0.05$). Diagnostic tests of *H. pylori* (rapid urease test or blood antibody test) were made for 28 Patients with GERD and positive *H. pylorus* was found for 21 patients (24.71%). These tests were not applied to 64 patients with GERD and 27 patients who hadn't any complaints of typical or atypical GERD symptoms. In our study we found that 65 (74.71%) patients with vertigo positive had GERD (Table 3 and 4).

Table 4: Complaints related to GERD characteristics.

Characteristics	GERD (+ve)	GERD (-ve)
Number of patients	85 (75.89)	27 (24.11)
Age	59.2±3.8	57.6±3.6
Males	39 (45.88)	15 (55.56)
Females	46 (54.12)	12 (44.44)
Duration of GERD (years)	6.5±1.2	
Exacerbations of GERD		
At night	8 (9.41)	0
In the daytime	17 (20)	0
In the morning	11 (12.94)	0
In the evening	8 (9.41)	0
GERD being constant irrespective of the time of the day	41 (48.24)	0
<i>H. Pylori</i> +ve	21 (24.71)	7 (25.93)
Odds ratio; p value	1.465 (95 CI: 1.2-1.4), $p < 0.005$	
With vertigo	68 (80)	27 (100)
Without vertigo	17 (20)	0

DISCUSSION

GERD is a disease which has a wide variety of symptoms.⁵⁻⁷ While heartburn and regurgitation are the mainstay symptoms and popularly relied upon, there may be a range of other symptoms of varying intensities that usually go unreported. A significant number of patients are reported to having need of surgical corrections as well.

There are literally very little studies confirming the association of vertigo with GERD and our study proceeded with the hypothesis. This field of study required more diagnostic tests (endoscopic examination, evaluation of *H. Pylori*, otorhinolaryngologist examination) for all patients with peripheral vertigo and a group with more patients to find out GERD and *H. Pylori* relation with vertigo. There are no accurate diagnostic methods to evaluate all the theories, but it is known that *H. pylori* increased pepsinogen secretion from human peptic cells through a calcium and nitric oxide mediated intracellular pathway.⁸

It is shown through this study that vertigo is quite prevalent among patients with GERD. It may require more diagnostic examinations of patients with peripheral

vertigo, like the otorhinolaryngologist examinations and the results were quite similar to the findings of some other researchers. Some studies have been conducted for investigation of otitis media relation to GERD by measuring pepsinogen levels in the middle ear. But how relevantly pepsinogen could get into the middle ear, except by active endogenous production of pepsinogen getting there by way of gastroesophageal reflux? When O'Reilly et al showed that the only way for pepsin to get to the middle or ear space of a child was through reflux and when Lorente et al similarly and separately showed that basal pepsinogen secretion depended upon *H. pylori* as well; the relation could be effectively established.^{8,9}

Similar to our study Fancy et al confirmed the presence of *H. pylori* in the nasopharynx and middle ear space, but Ozcan et al was unable to detect the presence of *H. pylori* in the middle ear effusions and adenoid specimens of children with 'chronic otitis media with effusion'.^{10,11}

There were relatively important findings by Iriz et al found presence of *H. pylori* tested in all tympanosclerosis biopsies, and by Yazdi et al that auditory recovery in GERD positive patients was significantly lower, even six months after surgery and thus suggesting evaluation for GERD an important procedure before tympanoplasty.^{12,13}

Regurgitation and heartburn have been reported to be other common features of GERD along with pathologic acid flux. For some patients with silent reflux, some of the more recognizable symptoms aren't present, but GERD could still be damaging the esophagus nonetheless. When a patient experiences reflux, they may have stomach contents and acid reaching far up their esophagus. This can lead to damage as well as leave a lingering taste in the mouth as the acid creeps upward. Partnered with difficulty in swallowing, coughing and belching with GERD, many patients feel nauseated or experience vomiting. Indigestion has also been reported by some patients. A less common symptom that can be attributed to GERD is dizziness. This can occur for a few reasons. When acid refluxes into the upper GI system, it can affect the tubes that lead to the inner ear. When these tubes become irritated, swelling can occur, causing a loss of balance. This symptom is thought to be more common with GERD that occurs when lying down after a meal. Dizziness could also be a side effect of a medication people may be taking to keep GERD at bay, but dizziness can be a symptom of many other conditions as well. It is often hard to pinpoint its exact cause.

Limitations of the study included the retrospective character of the analysis and data sampling being of long duration. The data too may be bit discontinuous as the sample size tend to get reduced in order to comply with the parameters of the study with each studied patient and with the reduction of the number of sampling staff. There is very little present knowledge or established researches about the mechanism on how gastroesophageal reflux could be associated with peripheral vertigo. We did not have confirmed history of our patients about whether they

had otitis in their past or not, and detailed mechanism related to the entry of gastric juices into the ear are still required to be studied.

CONCLUSION

The present data confirms the hypothesize that one of the peripheral vertigo causes could be GERD, by way of a mechanism which may include reflux of gastric acids causing inflammation, or *H. Pylori* could exist and cause local infection. The present study found a definite prevalence of GERD and *H. Pylori* among patients with peripheral vertigo.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Gupta S, Gupta V, Gupta A. Vertigo in association with gastro-esophageal reflux disease. *Int J Otorhinolaryngol Head Neck Surg* 2021;7:751-4.