

Aetiology of peripheral vertigo in patients attending a tertiary care hospital in South India – A cross sectional study

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Abstract

Aims: Vertigo is a very common complaint in clinical practice. The lifetime prevalence of vestibular vertigo in the general population is 7.4%. The literature on etiology of vertigo is scanty in Indian scenario, so this study was thus conducted to identify the etiology clinical presentations and risk factors of peripheral vertigo. **Materials and Methods:** This was a prospective study during the period between February 2014 and September 2015 with history, clinical evidence, and investigation findings suggestive of peripheral vertigo. **Results:** A total of 50 patients of age group 18-80 years comprising of 22 males (44%) and 28 females (56%) were included in the study. Benign paroxysmal positional vertigo (BPPV), vestibular neuritis, Meniere's disease and labyrinthine fistula were identified as the common causes of peripheral vertigo. BPPV was identified in 30 (60%) patients attending our ENT OPD followed by Vestibular neuritis in 18 (36%) patients. Two female patients were identified to have peripheral vertigo due to Meniere's disease and labyrinthine fistula. BPPV was common among the females on the right ear affecting the posterior semi-circular canal. **Conclusion:** Benign paroxysmal positional vertigo (BPPV), Vestibular neuritis, Meniere's disease and labyrinthine fistula are the common aetiologies of peripheral vertigo. Among those with BPPV posterior semi-circular canal involvement was most frequent, and more commonly on the right sided and older female group. **Clinical Significance:** A detailed history regarding the characteristics of vertigo and a thorough neuro-otologic examination provides useful insights into the underlying causes and will be helpful in offering a definitive treatment to the patient.

Key Words: BPPV, Etiology of Vertigo, Vestibular Neuromitis.

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Received Date: 30/04/2018 Revised Date: 17/05/2018 Accepted Date: 22/06/2018

DOI: <https://doi.org/10.26611/1016633>

Access this article online

Quick Response Code:



Website:
www.medpulse.in

Accessed Date:
26 June 2018

unknown cause, 80% have vestibular impairment, and 40% complain of vertigo². Thus, conditions affecting the vestibular system are important both numerically, and also in terms of social and economic morbidity. Vertigo has multi-causative etiology and hence the patients may consult various specialties including psychiatry, otolaryngology, neurology and cardiology. Although all these disciplines play an important role in the evaluation of the patient, a good history and focal physical examination in the primary care setting can usually reveal the diagnosis. The management approaches employed by these clinicians will be varied considerably. Vertigo is often an untreated symptom and is frequently associated with serious handicap and considerable psychological morbidity³. Several acute pathologic conditions can present with vertigo as the initial complaint. A prompt diagnosis is inevitable in order to ensure an adequate treatment as well as to cope with the cost and

INTRODUCTION

Vertigo is a very common complaint in clinical practice. The lifetime prevalence of vestibular vertigo in the general population is 7.4%¹. In most of the affected persons, vertigo results in a medical consultation, interruption of daily activities, or sick leave. Of patients who present to emergency departments with falls of

effectiveness⁴. Peripheral causes of vertigo arise from abnormalities in the vestibular end organs (semi-circular canals and utricle), vestibular nerve, and vestibular nuclei. Most of these causes are benign and readily treatable. About 46% patients presented with vertigo found to be due to an otological disorder⁵. The literature on etiology of vertigo is scanty in Indian scenario with only one retrospective report in tertiary level Otolaryngology units^[6]. This study was thus conducted to identify the etiology clinical presentations and risk factors of peripheral vertigo.

MATERIALS AND METHODS

This was a prospective study of all the patients who presented in the ENT outpatient of Meenakshi Medical College Hospital And Research Institute, Kanchipuram during the period between February 2014 and September 2015 with history, clinical evidence, and investigation findings suggestive of peripheral vertigo. Patients with central vertigo, vertebral artery insufficiency, CNS tumours and with multiple sclerosis were excluded from the study. Consent was obtained from the patients or their relatives and the study design was approved by the Institutional ethics committee for research.

Method of recruitment of study participants: A thorough history was first taken for each patient about the vertigo (duration and frequency of episodes, precipitating factors, associated features like decreased hearing, tinnitus, nausea/ vomiting, headache etc.), medications taken, trauma, or exposure to toxins and the family history regarding hereditary conditions like migraine. A complete examination including general, oto-neurological examination, otoscopic examination, tuning fork tests, eye examination and audiological evaluation was performed on all patients. Computerised tomography or magnetic resonance imaging was done in selected cases to rule out other central causes. Relevant blood investigations were done to rule out general causes of vertigo and giddiness. Patients who had central and general causes of vertigo were excluded from the study. 50 patients who had history, clinical signs and investigative findings suggestive of peripheral vertigo were further categorised and data obtained were collated and documented.

RESULTS

A total of 50 patients of age group 18-80 years comprising of 22 males (44%) and 28 females (56%) were included in the study as depicted in Table 1. All were diagnosed to have peripheral vertigo based on the history taken and the specific otologic examinations undergone by them.

Table 1: Age and Gender distribution of patients with peripheral vertigo

Age (in years)	Male n(%)	Female n(%)	Total n (%)
14-20	1 (2)	1 (2)	2 (4)
21-30	5 (10)	5 (10)	10 (20)
31-40	5 (10)	4 (8)	9 (18)
41-50	4 (8)	10 (20)	14 (28)
51-60	3 (6)	7 (14)	10 (20)
61-70	3 (6)	1 (2)	4 (8)
71-80	1 (2)	0 (0)	1 (2)
TOTAL	22 (44)	28 (56)	50 (100)

The duration of vertigo in most of the patients was between few weeks to few months. Out of 50 patients, 37(74%) patients presented that their duration of vertigo was between 1 week and 6 months and nine (18%) patients presented with less than 1 week duration of vertigo (Table 2).

Table 2: Duration of peripheral vertigo

Duration of vertigo	Number of patients	Percentage
< 1 Week	9	18%
1 - 3 Weeks	24	48%
>3 Weeks - 6 Months	13	26%
7 - 12 Months	3	6%
>12 months	1	2%

Benign paroxysmal positional vertigo (BPPV), vestibular neuritis, Meniere's disease and labyrinthine fistula were identified as the common causes of peripheral vertigo. BPPV was identified in 30 (60%) patients (Table 3) attending our ENT OPD followed by Vestibular neuritis in 18 (36%) patients. Two female patients were identified to have peripheral vertigo due to Meniere's disease and labyrinthine fistula. BPPV was common among the females on the right ear affecting the posterior semi-circular canal (Table 4).

Table 3: Aetiologies of peripheral vertigo –gender distribution

Aetiology	Gender distribution		Total Number of patients	Percentage (%)
	Male n (%)	Female n (%)		
BPPV	12 (40)	18 (60)	30	60%
Vestibular Neuritis	10 (55.6)	8 (44.4)	18	36%
Meniere's Disease	-	1	1	2%
Labyrinthitis	-	1	1	2%

Table 4: BPPV (most common cause of peripheral vertigo) – canal distribution

Canal	Posterior Semi Circular Canal	Lateral Semi Circular Canal	Anterior Semi Circular Canal
Number	24	5	1
Percentage (%)	80	16.7	3.3

DISCUSSION

In the present study, among the 50 patients suffering from peripheral vertigo, 30 patients were diagnosed as BPPV, 18 as vestibular neuritis and 1 each as Meniere's disease and labyrinthine fistula. BPPV is the most common cause of peripheral vertigo as suggested in a study by Nedzelski J M *et al.*⁷ In the present study also BPPV emerged as the single most common cause of peripheral vestibular disease. Increased road travel on a daily basis or manual labor could be the reasons for the higher incidence. However, this is only an assumption and needs further study to prove it. The duration of symptoms in BPPV patients, who presented to the out-patient department seemed to range from 1 month to a year. All BPPV patients reported of multiple short episodes of vertigo, associated with change of head position. The number of episodes of vertigo ranged from 3 to as high as 20. Episodes of vertigo in BPPV, frequently, are clustered in time and separated by long remissions.⁸ Primary physicians tend to treat the episodes of vertigo in BPPV with labyrinthine sedatives after which the patient is relieved of symptoms temporarily and this could be the reason why, the patients presented to the specialist as late as even one year. Most of the BPPV patients were females between the fifth and eighth decade age group which is in accordance with study by Baloh *et al.*^{9,8}. In most cases of BPPV, no specific etiology could be identified. Baloh and colleagues,⁹ in a large study, could not identify a cause for BPPV in 48 % of cases. The most common known cause was closed head injury followed by vestibular neuritis. BPPV may eventually develop in nearly 15 % of patients suffering from vestibular neuritis.⁸ Other cited predisposing events include infection and certain surgical procedures like stapedectomy⁹ and cochlear implantation.¹⁰ Prolonged bed rest and Meniere's disease also are predisposing factors.⁸ In the current study, only 3 patients out of the 30 BPPV cases could properly remember and report a recent incident of minor trauma. The other patients could not provide information regarding any possible causative factors. BPPV can occur due to relatively minor head trauma¹¹ about which the patient tends to forget. In case of BPPV after vestibular neuritis, symptoms may not begin for even years after an episode of vestibular neuritis¹² and this could be the reason why the patients are not able to remember regarding the past episode. The diagnosis of BPPV is made by observing the classic eye movements in association with Dix-Hallpike manouever, combined with a suggestive history.⁸ Most patients seemed to be affected by posterior semicircular canal (SCC) BPPV. 24 (80%) out of 30 BPPV cases, in the present study, were found to have posterior SCC BPPV, five patients had lateral SCC BPPV and only one patient

had anterior SCC BPPV. Other studies also, have reported a higher occurrence of posterior SCC BPPV⁸, with a 15%^[13] and 2%^[14] involvement of lateral and anterior canals respectively. In the present study also posterior SCC BPPV was found to be most common (80%) and an incidence of 16.7% and 3.3% was found for the lateral and anterior canals respectively. This correlates with the other studies. The higher involvement of posterior SCC canal seems to be due to its anatomical alignment which leads to the otoconia being trapped easily.^{15,16,17} Vestibular neuritis was identified as second most common cause of peripheral vertigo seen most commonly in young and middle-aged adults aged between 20 and 60 years.^{18,19,20} In the present study also 16 out of 18 patients with vestibular neuritis were between the age of 20 and 60 years. Only 2 patients were above 60 years of age. Typically, the dizziness lasts for days, with gradual, definite improvement throughout the course. Balance-related complaints may be present even for months after resolution of the acute disease.⁸ Previous researchers state that the severe initial phase of vestibular neuritis usually lasts between two and three days²² but may last a week or longer and that the recovery phase is characterized by mild and gradually resolving vertigo or unsteadiness and usually lasts days or weeks.²¹ The course of the whole illness averages six weeks,^{23,21} but may last nine weeks or longer.²² The data collected during the present study shows that in 61.1% of patients with vestibular neuritis, the symptom duration has been between 1 and 3 weeks. In 4 out of the 18 patients with vestibular neuritis, the duration of symptoms exceeded 3 weeks with the maximum duration being 6 months. Previous studies have shown an association between vestibular neuritis and preceding or concurrent infectious illness in 43²¹ - 46%²⁴ of cases. Most of these infections have been found to be non-specific upper respiratory tract infections,^{24,25} influenza,²⁰ or focal sepsis of the upper respiratory tract, such as tonsillitis,²⁴ and dental sepsis.²⁴ In our study we were able to elicit a history of preceding upper respiratory tract infection from 5 patients (28%) among the 18 patients with vestibular neuritis. The others either did not have a history of preceding infection or were not able to recount the details of a previous infection. The incidence of Meniere's disease in other studies were between 19% and 24%^{27,26} though in the present study, only one patient had Meniere's disease. Patients often have a cluster of attacks separated by long remissions. Silverstein and co-workers²⁸ noted that vertigo ceased spontaneously in 57% of patients in 2 years and in 71% after 8.3 years. The long remissions and the spontaneous resolution of symptoms over time in most patients, could be the reason for the low presentation of Meniere's disease. Only 1 case of

labyrinthine fistula was diagnosed, in the present study. The fistula occurred secondary to right sided active squamous epithelial COM.

CONCLUSION

Benign paroxysmal positional vertigo (BPPV), Vestibular neuritis, Meniere's disease and labyrinthine fistula are the common aetiologies of peripheral vertigo. Among those with BPPV posterior semi-circular canal involvement was most frequent, and more commonly on the right sided and older female group the incidence in other studies were between 19% and 24%^{27,26}. A detailed history regarding the characteristics of vertigo and a thorough neuro-otologic examination provides useful insights into the underlying causes and will be helpful in offering a definitive treatment to the patient.

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Source of Support: None Declared
Conflict of Interest: None Declared