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Original Research Article

Clinical-epidemiological profile of vestibular migraine patients: Indian scenario

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ABSTRACT

Background: The main objective of this study was to observe the Indian clinical scenario and analyse the clinical and epidemiological profile of patients with vestibular migraine.
Methods: This is a retrospective observational descriptive study. The outpatient records of the vertigo clinic at Department of Otorhinolaryngology of SGT medical college, Budhera, Gurgaon, Haryana was assessed from April 2023 to July 2023. Patients who were diagnosed with vestibular migraine based on ICD classification as follows was included in the study.
Results: Study population predominantly comprised of 77% (17) females and 23% (5) of males. Almost 80% of the study population belonged to age group 31-40 years. Each episode of vertigo lasts for seconds in 50% of the patients and minutes in 45% of the patients. All patients had episodic vertigo.59% of patients described the vertigo as rotatory,18 % of the study population reported imbalance,18 % described swaying and 5% reported blackouts. Most of the examination was normal except 5 out of 22 patients reported giddiness on testing vertical saccades.
Conclusions: Vestibular migraine is an underdiagnosed condition in India, there's not much research and awareness, hence this study aims to overcome these limitations. Most of the patients were middle aged women. The physical and audiological examination of most patients were normal but showing abnormalities on testing saccades.

Keywords: Vestibular migraine, Clinico-epidemiology, Vertigo

INTRODUCTION

Vestibular migraine is an underdiagnosed but increasingly recognized neurological condition that causes spontaneous, non-positional and episodic vertigo with features of migraine.[1]

Both migraine and vertigo are common clinical conditions that affect 14% and 7% of the general population, respectively. Their concurrent occurrence would be 1%, if they were occurring at random. However, recent epidemiological studies have indicated that 3.2% of the population have both migraine and vertigo.[2]

Vestibular migraine can occur at any age group and is predominantly seen in females as compared to males at a frequency of up to 5:1.[1-3] It occurs more commonly in patients who suffer from migraine without aura than in those who suffer from migraine with aura.[3]

One of the proposed mechanisms for vertigo in vestibular migraine is due to the hypoperfusion of the inner ear during migrainous attacks, secondary to vasospasm resulting in vestibular symptoms.[1]

Vestibular migraine has a diverse clinical presentation.[1] Most patients have history of migraine in the past before the onset of vestibular migraine.[3] Sometimes some patients

have a headache-free interval of several years before onset of vestibular migraine.[1] Migraine headaches are often replaced by vertigo attacks in perimenopausal women.[3]

Patients might have migraine headache at the same time as their vestibular symptoms.[4] Vestibular symptoms may mimic benign paroxysmal positional vertigo, and Meniere's disease.[1]

Vestibular symptoms often include spontaneous vertigo, dizziness induced by head movement, positional vertigo, or gait instability.[4] Episodes of vertigo usually last between 5 min to 72 hours. These episodes are often accompanied by other symptoms of migraine, like headache, photophobia, phonophobia and visual aura.[1]

These episodes can often be triggered by factors, such as menstrual period, irregular sleep, stress, physical activity, dehydration, certain foods and drinks, and intense sensory stimulation.[2]

Diagnostic criteria According to International Headache Society criteria for vestibular migraine there should be at least 5 episodes with vestibular symptoms of moderate or severe intensity, lasting 5 min to 72 hours, history of migraine and migraine feature with at least 50% of vestibular episode.[1]

Neurological examination during acute attacks can sometime reveal spontaneous or positional nystagmus.[1] Video electronystagmography is generally normal, with unilateral labyrinthine hypofunction reported in up to 20% of cases. Hearing assessment is generally normal in most patients.[2]

The main objective of this study was to observe the Indian clinical scenario and analyse the clinical and epidemiological profile of patients with vestibular migraine. Vestibular migraine is an underdiagnosed condition in India, there's not much research and awareness, hence this study aims to overcome these limitations.

METHODS

Study design

It was a retrospective observational descriptive study.

Sampling technique

Sampling technique used was random sampling.

Patient selection

Patient included in this study presented to vertigo clinic, department of ENT in a tertiary hospital (SGT Medical College, Budhera, Gurgaon, Haryana) over a period of four months (April 2023 to July 2023). Patients who were diagnosed with vestibular migraine based on ICD classification as follows were included in the study (Figure 1). The outpatient records of the clinic were assessed from April 2023 to July 2023.

All patient records are analysed according to epidemiological data such as age, gender, clinical characteristic of disease, previous medical history, vestibular examination and audiological evaluation. As part of vertigo evaluation, they underwent nystagmus evaluation, head impulse test, fistula test, saccades, pursuit examination, finger nose test, dysdiadochokinesia, Romberg test, tandem gait, supine roll test and dix hall pike test.

Statistical analysis

The requisite data was entered into Microsoft excel and analysed. Descriptive data was analysed and presented in the form of frequency and percentage using pie chart and bar diagrams.

Ethical approval

Since it's a retrospective observational descriptive study conducted on already available data and patients' personal details are not included in the study, ethics committee approval was not taken.

RESULTS

Out of the 22 patients attending the vertigo clinic, all 22 patients were diagnosed with definite and probable vestibular migraine according to ICD Classification as follows were included in the study (Figure 1).

Study population predominantly comprised of 77% (17) females and 23% (5) of males (Figure 2).

Almost 80% of the study population belonged to age group 31-40 years. Out of 77% of females 58% belonged to age group of 31-40 years (Figure 3).

3 out of 22 patients had history of head injury. 1 patient had family history of migraine.

6 patients presented with tinnitus,3 presented with bilateral tinnitus,2 presented with left ear tinnitus,1 patient presented with right ear tinnitus (Table 1).

6 patients presented with decreased hearing, 5 patients with bilateral decreased hearing and 1 with unilateral decreased hearing (Table 1).

45% (15) of the patients, vertigo lasted for 7 days to 6 months,15% (3) of the patients lasted for more than 1 year (Figure 4).

Each episode of vertigo lasts for seconds in 50% of the patients and minutes in 45% of the patients (Figure 5).

Table 1: Common auditory symptoms in vestibular migraine patients.

Symptoms	n	%
Only tinnitus	2	9.09
Only decreased hearing	2	9.09
Both	4	18.18
No symptoms	14	63.63
Total	22	

1. **Vestibular migraine**

   A. At least 5 episodes with vestibular symptoms of moderate or severe intensity, lasting 5 min to 72 hours.
   B. Current or previous history of migraine with or without aura according to the International Classification of Headache Disorders (ICHD)[9]
   C. One or more migraine features with at least 50% of the vestibular episodes:
      - o headache with at least two of the following characteristics: one sided location, pulsating quality, moderate or severe pain intensity, aggravation by routine physical activity
      - o photophobia and phonophobia,
      - o visual aura

   D. Not better accounted for by another vestibular or ICHD diagnosis[9]

2. **Probable vestibular migraine**

   A. At least 5 episodes with vestibular symptoms of moderate or severe intensity, lasting 5 min to 72 hours
   B. Only one of the criteria B and C for vestibular migraine
   C. Not better accounted for by another vestibular or ICHD diagnosis[9]

Figure 1: Diagnostic criteria.[5]

All patients had episodic vertigo. 59% of patients described the vertigo as rotatory, 18% of the study population reported imbalance, 18% described swaying and 5% reported blackouts (Figure 6).

60% (9) of the study population reported head movements as triggers for the occurrence of vertigo. 26.6% (4) of patients reported motion and 13.33% (2) of patients reported stress respectively (Figure 7).

8 patients reported relief of vertigo temporarily on bed rest, 5 patients out of 22 reported relieve with medication.

All patients systolic blood pressure supine and standing was >100 mmHg and diastolic BP was >70 mmHg.

Fistula test was negative in all patients and head impulse test was negative in all patients.

5 out of 22 patients reported giddiness on testing vertical saccades.

All patients had normal horizontal saccades and pursuit test was normal in horizontal and vertical direction.

Finger nose test and dysdiadochokinesia test was normal in all patients. Dix Hallpike test was normal in all patients, supine roll test was normal in all patients.

Audiological examination 6 patients out of 22 have presented with sensory neural hearing loss, 2 patients out of 6 presented with high frequency hearing loss, 2 out of 6 patients presented with moderate mixed hearing loss, 1 out of 6 patients presented with right sided profound hearing loss (Table 2).

Sensory and motor examination of all patients were normal.

Table 2: Pure tone audiometry findings in patients with vestibular migraine.

Types of findings	N	%	Right unilateral		Left unilateral		Bilateral	
			N	%	N	%	N	%
CHL	0	0	0	0	0	0	0	0
MHL	1	4.54	0	0	1	4.54	0	0
SNHL	5	22.7	1	4.54	0	0	4	18.18
Normal	16	72.7	0	0	0	0	0	0
Total	22							

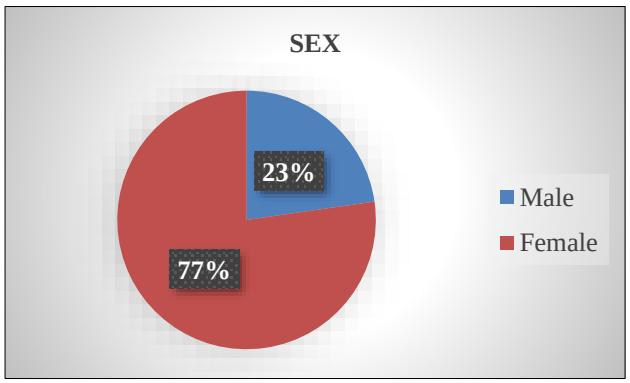

Figure 2: Sex distribution in vestibular migraine patients.

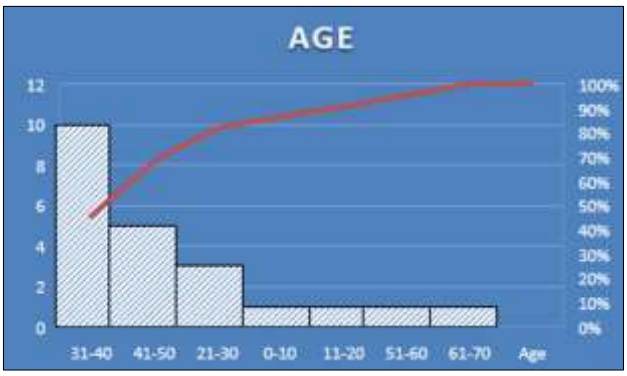

Figure 3: Age distribution in vestibular migraine patients.

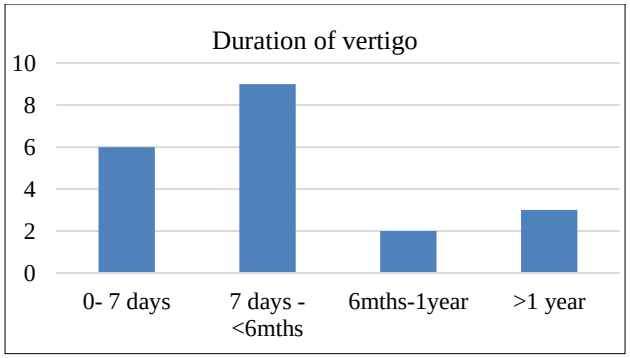

Figure 4: Distribution of vertigo frequency in patients with vestibular migraine.

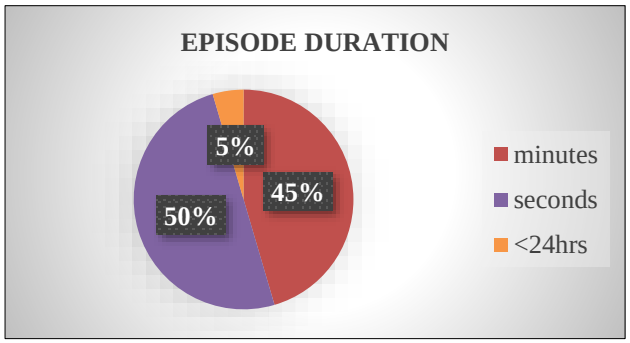

Figure 5: Frequency of duration of each episode in vestibular migraine patients.

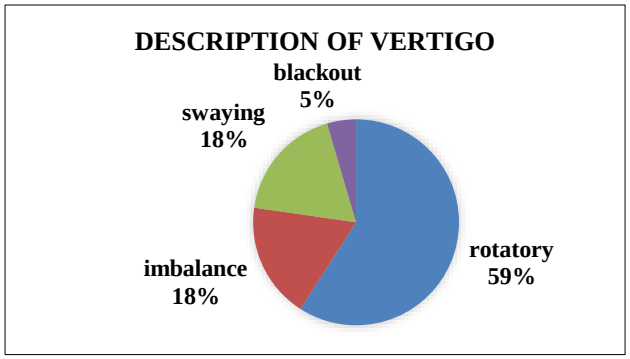

Figure 6: Description of vertigo episodes in vestibular migraine patients.

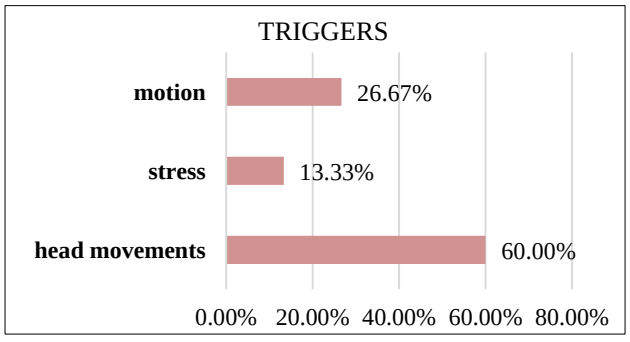

Figure 7: Triggers reported in vestibular migraine patients.

DISCUSSION

One of the proposed mechanisms for vertigo in vestibular migraine is due to the hypoperfusion of the inner ear during migraine attacks, secondary to vasospasm resulting in vestibular symptoms.[1] Hence one of the most common causes of recurrent vertigo is vestibular migraine.

Vestibular migraine can occur at any age group and is predominantly seen in females as compared to males at a frequency of up to 5:1.[1-3] As per the study conducted by Ligia et al female (94.1%) preponderance was more than males (5.9%) in vestibular migraine and it showed prevalence was more among females in their fifth and sixth decade of life (mean 46.1 years).[2]

Similarly, the observational study conducted by us shows higher prevalence among female but mainly between third and fourth decade of life. Female preponderance is generally due to the autosomal dominant pattern of inheritance which explains the decreased penetrance in males.[6] Other supporting literature done on vestibular migraine corroborates similar results.[7-10]

The total period during which short attacks of vertigo recur is defined as duration of the disease in vestibular migraine.[11] It was found that 45% of the individuals reported episodes of vertigo lasting from almost a week up to 6 months whereas 15% of the patients reported episodic vertigo for more than 1 year. The heterogeneous spectrum of migrainous vestibular dysfunction has been described in various literature.[12-15]

Vestibular migraine is an episodic disorder; however, the duration of attacks ranges from seconds to days.[9] As per this study in the Indian clinical scenario all the patient reported episodic vertigo. Each episode of vertigo in this study lasts for seconds in 50% of the patients and minutes in 45% of the patients. Vertigo attack show high variability in the duration of each episode.[11]

According to Lempert et al about 30% of patients have episodes lasting minutes, 30% have attacks for hours, and another 25% have attacks over several days. The remaining 15% have episodes lasting seconds only, which are triggered after repeated head motion, visual stimulation, or after changes of head position.[11]

As per our study in Indian population, 60% (9) of the study population reported head movements as triggers for the occurrence of vertigo, 26.6% (4) of patients reported motion and 13.33% (2) of patients reported stress respectively. Shin et al conducted a retrospective study in 131 patients and reported stress (39.7%), bright lights (26.7%), weather changes (26.0%), and sleep deprivation (26.0%) as the most common triggers for vestibular migraine.[16]

Vertigo was described as rotatory by 59% of the patients studied. Whereas vertigo was described as imbalance and

swaying in 18% of the study population respectively, and 5% reported blackouts. Similarly, in a study conducted by Dietrich on 90 cases of vestibular migraine, 78% of patients reported rotational vertigo and 38% of patients reported to-and-fro vertigo.[12]

In our study all patients reported concomitant occurrence of headache and vertigo, similarly, in the study by Ligia et al patients complained of concomitant occurrence of headache and vertigo, whereas isolated symptoms were reported in 14% of the patients.[2] However, various studies prove the appearance of vertigo symptoms at a later onset, when compared to headache.[7,9,10]

Photo and phonophobia or aura must accompany vestibular episodes in at least 50% of the episodes to characterize vestibular migraine. All the patients in our study reported either photophobia or phonophobia in relation to the headache.

27% of the study population reported hearing loss and audiometry confirmed sensory neural hearing loss. Only one patient reported unilateral profound hearing loss. Tinnitus was also reported by some patients. Study conducted by Ligia et al conducted in Brazil shows that 61.53% of the subjects, auditory symptoms were observed. Main complaint was tinnitus. Predominantly sensorineural, bilateral, symmetric, descending, and mild hearing loss was seen in most of the subjects.[2]

Based on these symptoms the diagnostic dilemma we commonly face is differentiating between vestibular migraine and Meniere's as these patients sometimes present with the same clinical spectrum. The differentiating factor is seen in the study conducted by Radtke et al who attributed vestibular migraine to a much slower hearing loss when compared to that observed in Meniere's disease.[17]

On examination 22% of patients reported giddiness on performing saccades in this study. Oculomotor disturbances are commonly reported in vestibular migraine patients though pathophysiology remains unknown, and lot of studies are conducted for the same. Wesbuth and et al conducted a retrospective cohort study, including all vestibular migraine and probable vestibular migraine patients where video-nystamography (VNG) results were compared with a control group. VNG showed the following abnormalities: 21.7% spontaneous nystagmus; 33.3% positional nystagmus, mostly central; 26.7% optokinetic nystagmus; 56.7% smooth pursuit abnormalities and 70% saccade test abnormalities.[18]

Vestibular migraine is an underdiagnosed condition in India, there's not much research and awareness, hence this study aims to overcome these limitations. Most of the patients were middle aged women. The physical and audiological examination of most patients were normal but showing abnormalities on testing saccades.

Limitations

The number of patients included are only 22, hence for extrapolation of data a larger number of patients are required. Objective studies are not done on the patients as the main focus was to work up the clinic-epidemiological profile of vestibular migraine patients.

CONCLUSION

Vestibular migraine has been only recently described, and its diagnosis is purely clinical. The presence of symptoms that are common to other neurotological diseases, associated with the absence of an objective test, makes its diagnosis challenging. Vestibular migraine remains an underdiagnosed condition in India. This study helps in analysing the clinic-epidemiological patterns in vestibular migraine hence identifying the most vulnerable population. The study results aim to guide clinicians in India to identify most commonly occurring features of vestibular migraine to narrow down the diagnosis.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Smyth D, Britton Z, Murdin L, Arshad Q, Kaski D. Vestibular migraine treatment: a comprehensive practical review. Brain. 2022;145(11):3741-54.
2. Morganti LO, Salmito MC, Duarte JA, Bezerra KC, Simões JC, Ganança FF. Vestibular migraine: clinical and epidemiological aspects. Braz J Otorhinolaryngol. 2016;82(4):397-402.
3. Bisdorff AR. Management of vestibular migraine. Ther Adv Neurol Disord. 2011;4(3):183-91.
4. Furman JM, Marcus DA, Balaban CD. Vestibular migraine: clinical aspects and pathophysiology. Lancet Neurol. 2013;12(7):706-15.
5. Lempert T, Olesen J, Furman J, Waterston, Seemungal B, Carey J, et al. Vestibular migraine: Diagnostic criteria Consensus document of the Bárány Society and the International Headache Society. Rev Neurol (Paris). 2014;170:401-6.
6. Lempert T, Neuhauser H. Epidemiology of vertigo, migraine and vestibular migraine. J Neurol. 2009;256(3):333-8.
7. Lempert T, Neuhauser H. Epidemiology of vertigo, migraine and vestibular migraine. J Neurol. 2009;256(3):333-8.
8. Neuhauser H, Leopold M, von Brevern M, Arnold G, Lempert T. The interrelations of migraine, vertigo, and migrainous vertigo. Neurology. 2001;56(4):436-41.
9. Furman JM, Marcus DA, Balaban CD. Vestibular migraine: clinical aspects and pathophysiology. Lancet Neurol. 2013;12(7):706-15.

10. Lempert T, Neuhauser H, Daroff RB. Vertigo as a symptom of migraine. Ann N Y Acad Sci. 2009;1164:242-51.
11. Lempert T, von Brevern M. Vestibular Migraine. Neurol Clin. 2019;37(4):695-706.
12. Dieterich M, Brandt T. Episodic vertigo related to migraine (90 cases): vestibular migraine? J Neurol. 1999;246(10):883-92.
13. Cutrer FM, Baloh RW. Migraine-associated dizziness. Headache. 1992;32(6):300-4.
14. Kayan A, Hood JD. Neuro-otological manifestations of migraine. Brain. 1984;107(Pt 4):1123-42.
15. Selby G, Lance JW. Observations on 500 cases of migraine and allied vascular headache. J Neurol Neurosurg Psychiatry. 1960;23(1):23-32.
16. Beh SC, Masrour S, Smith SV, Friedman DI. The Spectrum of Vestibular Migraine: Clinical Features, Triggers, and Examination Findings. Headache. 2019;59(5):727-40.
17. Radtke A, von Brevern M, Neuhauser H, Hottenrott T, Lempert T. Vestibular migraine: long-term follow-up of clinical symptoms and vestibulo-cochlear findings. Neurology. 2012;79(15):1607-14.
18. Waissbluth S, Sepúlveda V, Leung JS, Oyarzún J. Vestibular and Oculomotor Findings in Vestibular Migraine Patients. Audiol Res. 2023;13(4):615-26.

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