ORIGINAL RESEARCH

Auditory functions in patients with vestibular migraine

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ABSTRACT

Background: Vertigo or dizziness brought on by a migraine is known as vestibular migraine (VM). Since one-third of individuals with migraine headaches also experience dizziness, the prevalence of VM can be approximated to be around 3% of the general population. The present study was conducted to assess auditory functions in vestibular migraine patients. **Materials & Methods:** 86 patients of vestibular migraine of both genders underwent pure tone audiometry (PTA), impedance audiometry, brainstem evoked response audiometry (BERA), and distortion product otoacoustic emissions (DPOAE). Parameters such as type of hearing loss, site and duration of attack was recorded. **Results:** Out of 86 patients, 50 were males and 36 were females. Site of attack was front in 45, back in 33 and both in 8 patients. Duration of attack was 0-1 hours in 48, 1-2 hours was 22 and >2hours in 6 cases. DPOAE was abnormal in 59 and normal in 27 cases. PTA was abnormal in 61 and normal in 27. BERA was abnormal in 38 and normal in 14. The difference was significant (P< 0.05). Common symptoms were zig zag spots in 47, hearing loss in 10, double vision in 23, tinnitus in 31 and darkness in field of vision in 8 cases. The difference was non- significant (P> 0.05). **Conclusion:** In most of vestibular migraine patients, DPOAE, PTA and BERA was abnormal.

Key words: tinnitus, vestibular migraine, zig zag spots

INTRODUCTION

Vertigo or dizziness brought on by a migraine is known as vestibular migraine (VM). Since one-third of individuals with migraine headaches also experience dizziness, the prevalence of VM can be approximated to be around 3% of the general population.[1] About 10% of people suffer from migraine headaches.Lightheadedness, imbalance, and head rotatory type are examples of vestibular symptoms. Additionally, they may exhibit auditory issues such phonophobia, diminished hearing, aural fullness, and tinnitus. There have been cases of abrupt, irreversible, and variable migraine-related hearing loss. However, the rate of hearing loss in migraine is modest.[2]

Dizziness of non-vestibular origin is indicated by feelings of lightheadedness, giddiness, unsteadiness, drowsiness, or approaching faint. Rotational vertigo or other deceptive perceptions of motion are indicative of vestibular symptoms.[3] Though vertigo and dizziness may indicate a difference between vestibular and non-vestibular symptoms, patients frequently confuse the two, and few medical professionals—aside from otoneurologists—can distinguish between the two. VM is basically an exclusion-based diagnosis. A physical examination is probably going to be OK.[4]Numerous tests, including audiometry, auditory brain stem evoked response, otoacoustic emissions, and brain imaging, could be performed to rule out additional medical conditions.[5] Another neurological condition that causes SNHL in adults is migraine. Numerous hearing impairments have been reported to manifest during the prodromal phase of migraine with aura. They are typically more prevalent, particularly in varieties of basillier migraine.[6]The most typical symptoms includeSNHL, tinnitus, speech and sound abnormalities, and intolerance to loud stimuli. Half the individuals have bilateral hearing loss. Hearing loss typically exhibits variability and low frequencies.[7] All of these inner ear symptoms could be explained by a labyrinthine artery vasospasm. From this viewpoint, it may be confused with Meniere illness (MH).[8]The present study was conducted to assess auditory functions in vestibular migraine patients.

MATERIALS & METHODS

The present study consisted of 86 patients of vestibular migraine of both genders. All patients were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. All patients underwent pure tone audiometry (PTA), impedance audiometry, brainstem evoked response audiometry (BERA), and distortion product otoacoustic emissions (DPOAE). Parameters such as type of hearing loss, site and duration of attack was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 86		
Gender	**Male**	**Female**
Number	50	36

Table I shows that out of 86 patients, 50 were males and 36 were females.

Table II Assessment of parameters

Parameters	Variables	Number	P value
Site	Front	45	0.01
	Back	33	
	Both	8	
Duration of attack	0-1 hours	48	0.03
	1-2 hours	22	
	>2 hours	6	
DPOAE	Abnormal	59	0.02
	Normal	27	
PTA	Abnormal	61	0.01
	Normal	27	
BERA	Abnormal	68	0.01
	Normal	18	

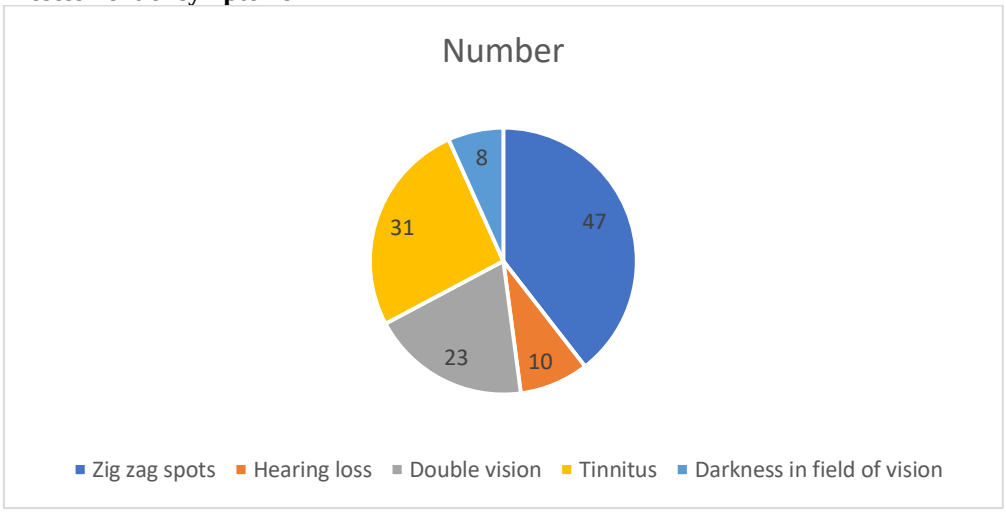
Table II shows that siteof attack was front in 45, backin 33 and bothin 8 patients. Duration of attack was 0-1 hours in 48, 1-2 hours was 22 and >2hours in 6 cases. DPOAE was abnormal in 59 and normalin 27 cases. PTA was abnormal in 61 and normalin 27. BERA was abnormal in 38 and normal in 14. The difference was significant (P< 0.05).

Table III Assessment of symptoms

Symptoms	Number	P value
Zig zag spots	47	0.75
Hearing loss	10	
Double vision	23	
Tinnitus	31	
Darkness in field of vision	8	

Table III, graph I shows that common symptoms were zig zag spots in 47, hearing loss in 10, double vision in 23, tinnitus in 31 and darkness in field of vision in 8 cases. The difference was non- significant (P> 0.05).

Graph II Assessment of symptoms



DISCUSSION

Since ancient times, people have been experiencing headaches known as migraines.[9] These headaches are characterized by aural neurologic symptoms that occur in one-third (1/3) of instances and are accompanied by neurologic, gastrointestinal, and otonom alterations in different combinations.[10,11] "Migraine without aura" is the most prevalent type of migraine, accounting for 90% of cases. The remaining examples involve either migraine attacks with aura alone or in conjunction with migraine attacks without aura.[12,13] Beyond phonophobia, the most prevalent auditory symptom, migraine sickness causes a range of neurologic symptoms, including vertigo, dizziness, hearing loss, tinnitus, and aural discomfort.[14,15]The present study was conducted to assess auditory functions in vestibular migraine patients.

We found that out of 86 patients, 50 were males and 36 were females.Takeuti AAet al[16]assessed auditory brainstem function in women with vestibular migraine using electrophysiological testing, contralateral acoustic reflex and loudness discomfort level.The study group consisted of 29 women with vestibular migraine in the interictal period, and the control group comprised 25 healthy women. Auditory brainstem response, frequency following response, binaural interaction component and assessment of contralateral efferent suppression were performed. The threshold of loudness discomfort and the contralateral acoustic reflex were also investigated. The results were compared between the groups.There was a statistically significant difference between the groups in the frequency following response and the loudness discomfort level.

We found that site of attack was front in 45, back in 33 and both in 8 patients. Duration of attack was 0-1 hours in 48, 1-2 hours was 22 and >2hours in 6 cases. DPOAE was abnormal in 59 and normal in 27 cases. PTA was abnormal in 61 and normal in 27. BERA was abnormal in 38 and normal in 14. The frequency of auditory impairment in eighty consecutive individuals with a diagnosis of vestibular migraine was assessed by Mathew et al.[17] In the second section, they compared the audiological characteristics of thirty patients with VM with thirty normal controls in a prospective case control study to see if there were any notable differences. Vestibular migraine occurs 22% of the time. The frequency of hearing loss in VM was 33%.

We found that common symptoms were zig zag spots in 47, hearing loss in 10, double vision in 23, tinnitus in 31 and darkness in field of vision in 8 cases. Tawfik S et al[18]compared auditory processing performance in migraine patients with and without dizziness and healthy controls.Sixty subjects were divided into 3 groups: control group, twenty normal healthy subjects, and study group I (twenty subjects diagnosed with migraine) and study group II (twenty subjects diagnosed with vestibular migraine). They were evaluated using the Central Auditory Processing Questionnaire for adults, tympanometry, pure tone audiometry, Psychophysical Central Auditory Tests, including Arabic Speech Intelligibility in Noise Test for adults, Arabic Dichotic Digit Test [version II], Gap in Noise Test, Duration Pattern Test, and Arabic Memory Tests. No significant difference was found between the two study groups I and II, but the significant difference was found between the study groups and the control group in all central auditory test results. Statistically significant difference was found between the control group and study groups I and II regarding all memory tests. The highest percentage of abnormality was present in temporal resolution and selective auditory attention in both study groups. There was no significant statistical correlation between the number of attacks/month and central auditory test results. There was no significant statistical correlation between the frequency of attacks in VM patients and central auditory test results.

CONCLUSION

Authors found that in most of vestibular migraine patients, DPOAE, PTAand BERAwas abnormal.

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