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Original Research Article

Effective management of peripheral vertigo in the real-world setting: an expert survey with neurologists in India

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ABSTRACT

Background: Benign paroxysmal positional vertigo (BPPV) accounts for approximately 20% of all cases of vertigo. Despite successful repositioning maneuvers, a significant proportion of patients experience residual dizziness, characterized by a persistent sensation of imbalance without true vertigo. The Epley maneuver remains the standard treatment for BPPV; however, adjunctive therapy with betahistine has been shown to facilitate vestibular compensation, thereby reducing residual dizziness and the risk of recurrent vertigo. This study aimed to assess expert opinions on the role of betahistine 48 mg/day for 3 months in preventing vertigo recurrence and reducing residual dizziness in patients with BPPV in real-world clinical practice.
Methods: Total 43 neurologists from diverse regions across India treating BPPV participated in the survey. A literature review based on the Medline database search was used to prepare a structured questionnaire about BPPV management, treatment practices, recurrence, and residual dizziness.
Results: Among the surveyed experts, 37% reported vertigo recurrence in 10-25% of patients following repositioning maneuvers. A majority (56%) indicated routine prescribing of betahistine at 48 mg/day. Furthermore, 67% opined that improved vestibular compensation and enhanced vestibular blood supply contributed to reduced recurrence, while 68% acknowledged the dose-dependent efficacy of betahistine. Notably, 35% reported a 75-90% reduction in residual dizziness with betahistine 48 mg/day administered for 3 months.
Conclusions: Residual dizziness and recurrence remain common after successful repositioning maneuvers in BPPV. Expert opinion from real-world practice supports adjunctive treatment with betahistine 48 mg/day for at least 3 months to facilitate vestibular compensation and significantly reduce residual dizziness and recurrence, with a favorable safety profile.

Keywords: Betahistine, BPPV, Peripheral vertigo, Recurrence, Residual dizziness

INTRODUCTION

Benign paroxysmal positional vertigo (BPPV) is responsible for about 20% of all vertigo cases.[1] The chief cause of BPPV is the detachment of otoconia from the utricular macula, migrating into the semicircular canals, resulting in a change in fluid dynamics of endolymph.[2,3] The canalith repositioning procedure (CRP) can promote the recovery of BPPV.[4,5] CRP helps by moving the otoconia to the utriculus.[6] But some patients, even after undergoing successful CRP for BPPV, still report residual dizziness, which may persist for a certain period. This imbalance is described as a sensation of lightheadedness or dizziness in the absence of vertigo or nystagmus, or short-lasting unsteadiness occurring during head movements, standing, or walking.[7-9] Residual dizziness may cause nervousness, panic, and insomnia, and can adversely affect the quality of life of patients. Residual

dizziness may also increase the risk of falls, especially in the elderly.[9-11] The prevalence of RD is reported to range from 31 to 61%.[9] Residual dizziness may last from a few days to several weeks.[12] Multiple causes have been postulated to explain residual dizziness, such as utricular dysfunction, unsuccessful canalith repositioning, an incomplete central adaptation after successful CRP, autonomic dysfunction, underlying systemic conditions, and the presence of anxiety/depressive symptoms.[13-15]

Although the Epley maneuver is considered the primary treatment in BPPV, anti-vertigo medications are effective in residual symptoms.[16] A multi-modal approach is used to treat vertigo.[17] The central histaminergic system plays an important role in the regulation of vestibular function. Antihistamine drugs used to treat vertigo are associated with sedation and an adverse effect on the recovery process.[18]

Betahistine hydrochloride is a structural analog of histamine, which is used to treat peripheral vertigo.[18] Betahistine does not have sedative effects.[18,19] Betahistine can be given along with a repositioning maneuver to reduce the occurrence of residual dizziness. At least 3 months of Betahistine in the dose of 48 mg/day is essential to ensure vestibular compensation, reduce recurrence, and residual dizziness in a case of BPPV.[20] Betahistine is effective and safe even in elderly patients with residual dizziness. Betahistine-treated patients have been reported to have better social activities. In severe forms of BPPV, betahistine might effectively reduce the symptoms.[16]

This study aimed to evaluate the role of betahistine in the prevention of recurrent vertigo and the prevention of residual dizziness in patients with BPPV. Alos, to ascertain whether 48 mg per day of betahistine was the preferred dosage in patients with peripheral vertigo due to BPPV. Moreover, aimed to understand from the experts the appropriate duration of therapy of betahistine used in the real-world setting for best results in patients with peripheral vertigo and residual dizziness.

METHODS

Total 43 neurologists from diverse regions across India who were treating patients with peripheral vertigo were invited to participate in a survey regarding their approach to treating peripheral vertigo in the real-world setting.

Prior to the meeting, a literature review was done using the Medline database. The keywords used for the search were betahistine, peripheral vertigo, residual dizziness, and BPPV. The findings of the literature review were used to frame a structured questionnaire about BPPV and residual dizziness. Insights from the analysis of the survey were chronicled, and a manuscript of the real-world approach to the management of vertigo was written.

RESULTS

Observations from the QR code facilitated

What is the recurrence of vertigo?

Total 28 respondents (65%) opined that recurrence is a 'spinning sensation in vertigo re-experienced by the patient. 15 respondents (34%) opined that recurrence could be described as any symptom of disease, like nausea, vomiting, dizziness, imbalance - not necessarily spinning.

How common is recurrence in your practice?

Total 16 respondents (37%) opined that 10-25% of their patients had recurrence of vertigo, while another 16 respondents (37%) opined that 25-50 % of their patients experienced recurrence of vertigo. About 9 respondents (20%) reported that 50-75% of their patients had recurrence of vertigo.

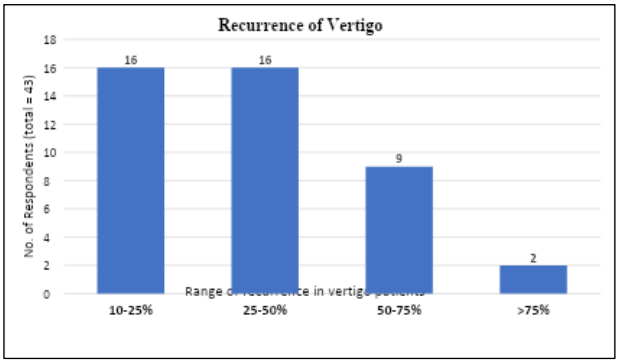

Figure 1: Recurrence of Vertigo.

What is the cause of the recurrence of vertigo?

The most common cause of recurrence was reported to be both impaired vestibular compensation due to insufficient dose (less than 48mg/day) and duration (less than 3 months) of betahistine and presence of remnant otoliths by about 23 respondents (53%) (Table 1).

Table 1: Causes of recurrence of vertigo.

	Impaired vestibular compensation due to insufficient dose (less than 48mg/day) and duration (less than 3 months) of betahistine	Remnant Otoliths	Both impaired compensation and remnant otoliths
Respondents No.	5	15	23
Percentage	12	35	53

What do you do to the betahistine regimen to reduce/avoid recurrence?

Total 24 respondents (56%) opined that they increased the dose of betahistine to 48mg per day and increased the duration of use of betahistine to 3 months to reduce or avoid recurrence (Table 2).

Why do you think there is less recurrence seen in patients on Betahistine?

Total 29 respondents (67%) opined that better vestibular compensation and improved vestibular supply led to lesser recurrence with betahistine.

Table 2: Approach to the use of betahistine in patients with recurrent vertigo.

	Both increase dose and duration	Increase the dose of betahistine to 48 mg/day	Increase the duration of use of betahistine to 3 months
Respondents No.	24	16	3
Percentage	56	37	7

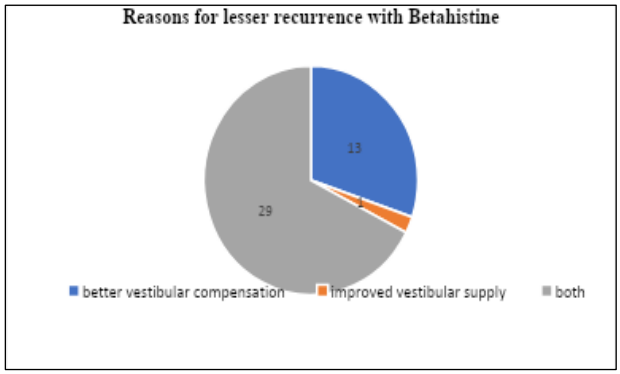

Figure 2: Reasons for lesser recurrence with Betahistine.

How much reduction in episodes of vertigo/recurrence have you seen after using betahistine at a dose of 48mg/day?

Total 20 respondents (47%) opined that they have observed a 50-75% reduction in the episodes of recurrence of vertigo in their patients (Figure 3).

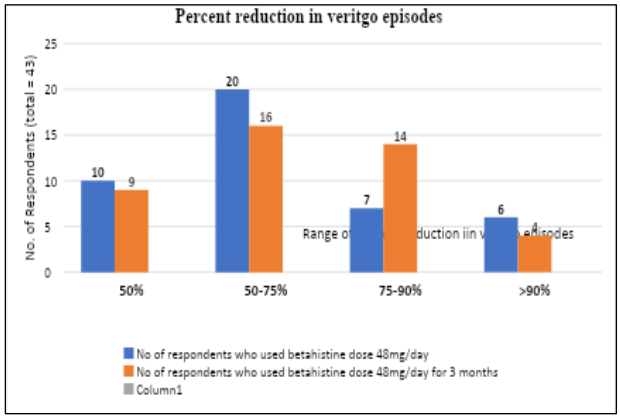

Figure 3: Percent reduction in episodes of vertigo/recurrence.

How much reduction in episodes of vertigo/recurrence have you seen after using betahistine 48 mg/day for 3 months?

Total 16 respondents (37 %) opined that a reduction of 50-75% in vertigo episodes was seen, while 14 respondents (33%) opined that a 75-90% reduction in vertigo episodes was seen with 48 mg per day of betahistine prescribed for 3 months (Figure 3).

Why do patients with vertigo on betahistine 48 mg/day for 3 months have less recurrence compared to lower dosage/duration of treatment?

Total 29 respondents (68%) opined that the use of betahistine demonstrates dose-dependent effects, improves vestibular blood supply, and helps in vestibular compensation. All the factors combined contribute to having a lower recurrence when betahistine is used at a dose of 48 mg/day for 3 months (Figure 4).

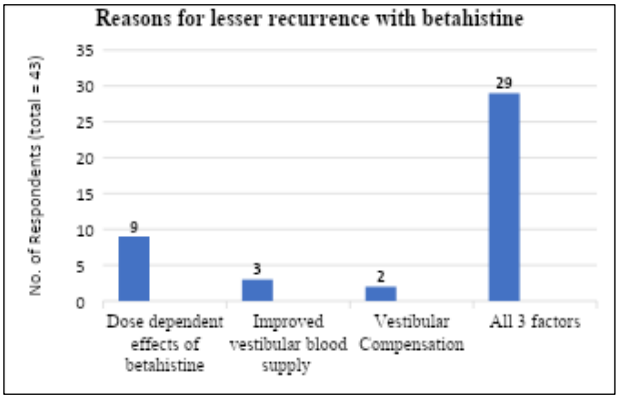

Figure 4: Reasons for lesser recurrence with betahistine.

What is residual dizziness?

Total 38 respondents (88%) opined that residual dizziness alludes to symptoms of imbalance/dizziness post

maneuvers without the spinning, while 5 respondents (12%) defined residual dizziness as symptoms of imbalance/dizziness post maneuvers with spinning.

How common is residual dizziness in your practice?

Total 17 respondents (40%) opined that 10-25% of their patients had residual dizziness, while 16 respondents (37%) stated that about 25-50% patients had residual dizziness**.** About 10 respondents (23%) noted that 50-75% of their patients had residual dizziness.

What is the cause of residual dizziness?

Total 21 respondents (49%) opined that both impaired vestibular compensation due to insufficient dose (less than 48mg/day) and duration (less than 3 months) of Betahistine and remnant otoliths caused residual dizziness. 14 respondents (33%) attributed residual dizziness to remnant otoliths alone.

What do you do to the Betahistine regimen to reduce/avoid residual dizziness?

The majority, i.e., 27 respondents (65%), adopt both approaches of increasing the dose and duration of Betahistine, which helps to reduce/avoid residual dizziness, while 13 respondents (30%) increase the dose of Betahistine to 48 mg/day to reduce/avoid residual dizziness.

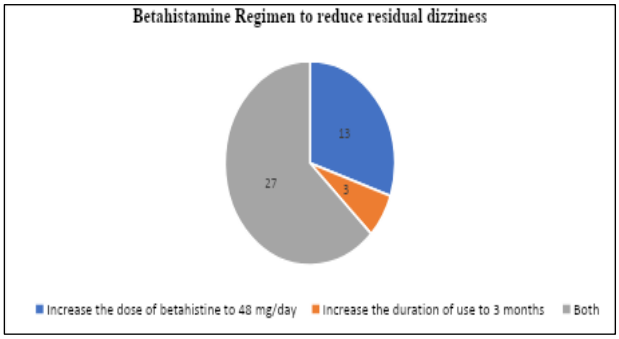

Figure 5: Betahistamine Regimen to reduce residual dizziness.

Why do you think there is less residual dizziness seen in patients of BPPV on betahistine when used at a dose of 48mg/day for 3 months?

Total 28 respondents (65%) opined that it was a combination of both vestibular compensation and improved blood supply that plays a crucial role in reducing residual dizziness when used at a dose of 48 mg/day for 3 months.

Total 13 respondents (30%) attributed the reduction in residual dizziness after treatment with betahistine to better vestibular compensation alone, while 2 respondents (5%) believed it was due to improved vestibular blood supply.

How much reduction in residual dizziness have you seen after using betahistine at a dose of 48mg/day?

Total 15 respondents (35%) opined that a 50-75% reduction in residual dizziness after using betahistine 48 mg per day. Meanwhile, 10 respondents (23%) observed a 75-90% reduction.

It shows that the majority of respondents observed a 50-75% reduction in residual dizziness, while a notable portion observed a 75-90% reduction (Figure 6).

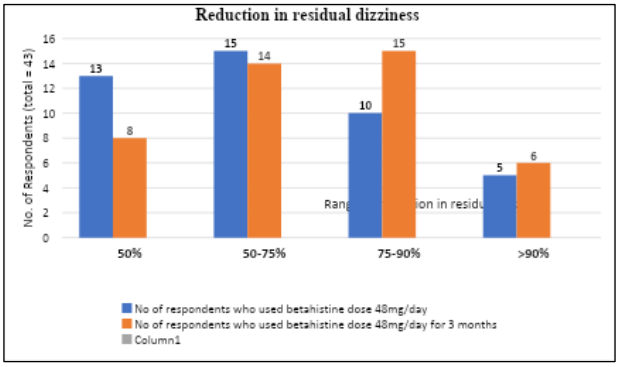

Figure 6: Reduction in residual dizziness.

How much reduction in residual dizziness have you seen after using betahistine 48mg/day for 3 months?

A total of 15 respondents (35%) opined that a 75 to 90% reduction in residual dizziness occurred after betahistine 48 mg per day for 3 months, while 14 respondents (33%) observed a 50-75% reduction in residual dizziness (Figure 6).

Why do patients with vertigo on betahistine 48 mg/day for 3 months have less residual dizziness compared to lower dosage/duration of treatment?

28 respondents (65%) opined that all factors, like the dose-dependent effect of betahistine, improved vestibular blood supply, and vestibular compensation, were responsible for the lesser residual dizziness compared after 48 mg of betahistine per day, while 7 respondents (16%) attributed the reduction solely to the dose-dependent effect of betahistine.

DISCUSSION

The recurrence rates of vertigo in patients with BPPV are estimated to be about 15-20% per year.[21] Repositioning maneuvers (RPM) are the gold standard treatment for the management of vertigo in patients with BPPV. The Epley or Semont maneuvers are useful to remove the otoliths from the semicircular canal in posterior canal BPPV.[1,22-24] But some patients still have residual symptoms after a successful canalith repositioning procedure. They have symptoms such as giddiness, a floating feeling, instability during walking, and even nausea and vomiting. Patients

with RD have persistent dizziness and/or instability without positional nystagmus and vertigo. If these residual symptoms persist for a long time, they could increase the risk of adverse events such as mental disorders and falls, thereby affecting patients' quality of life.[25]

Residual dizziness (RD) is defined as a sensation of non-specific dizziness in the absence of positional vertigo and typical nystagmus in patients upon resolution of BPPV.[26] The risk factors for RD after successful CRM in BPPV patients include elderly age, female gender, comorbidities, low vitamin D levels, and long duration of BPPV before treatment.[27] In 31-61% of patients, symptoms of residual dizziness last from a few days to several weeks.

Residual symptoms may be attributed to: (1) Functional degradation of macula utriculi and otolithic membranes, resulting in asymmetric function of bilateral macula utriculi owing to massive otolith shedding, and this results in residual dizziness symptoms; (2) Altered bilateral vestibular tone after the onset of otolith disease, which induces a new self-adaptive process of the central nervous system. But the self-adaptive process of the central nervous system, which developed earlier, starts again in patients following the canalith repositioning procedure, which triggers residual dizziness symptoms. (3) During repositioning, the remnant tiny otolith fragments in the semicircular canal or ampulla of the semicircular canal cannot be restored, resulting in residual symptoms after the maneuver. (4) The otoliths falling into the vestibular cistern could result in an alteration of the utriculus sensitivity or could cause neuronal degeneration, and this could easily induce residual symptoms such as dizziness. (5) Mental factors, including stress and anxiety, are other risk factors for residual symptoms. Patients with RD have a poor quality of life.[25]

Betahistine is approved in more than 80 countries and has been administered to more than 150 million patients.[28] Betahistine reduces symptoms of residual dizziness by improving the static components by rebalancing the vestibular nuclei neurons, reducing the spontaneous resting activity imbalance between the bilateral vestibular nuclei complexes through actions on the histamine H1, H2, and H3 receptors.[18] Excitatory effects on the vestibular nuclei neurons.[29,30] Betahistine also increases brain arousal, improves labyrinthine microcirculation, and increases local vestibular blood flow by relaxation of the pre-capillary sphincters of the microcirculation in the inner ear.[17] These aids functional recovery/behavioral adaptation through general upregulation of histamine.[31,18] Betahistine increases histamine turnover and release, and modulates the release of other neurotransmitters, such as GABA, and thus helps late-stage vestibular compensation. Betahistine also improves the rebalancing of the neuronal activity of the vestibular nuclei complexes on both sides. Oral betahistine accelerates functional recovery in patients with vertigo due to BPPV.[17]

The effectiveness of betahistine is dose-dependent and time-dependent. Studies have demonstrated 48 mg per day of betahistine to be effective for treating peripheral vertigo due to BPPV. This dose of 48 mg per day is useful to control symptoms, reduce frequency and intensity of attacks, facilitate vestibular compensation, improve quality of life, and prevent new episodes of vertigo.[17] Betahistine is more effective than dimenhydrinate in improving RD symptoms in patients with benign paroxysmal positional vertigo (BPPV) after successful Epley maneuver.[11]

In the post-marketing observational study by Zamergrad et al, the efficacy of betahistine dihydrochloride at the dose of 48 mg/day was proven in patients with paroxysmal vertigo of varied etiology.[32] About 74.1% of the patients rated the clinical response as good, very good, or excellent over a period of 1 to 2 months ($p<0.001$). Treatment with betahistine decreased the frequency of monthly vertigo attacks from 8.0 to 3.0 ($p<0.001$). No serious adverse effects of betahistine were reported.[32]

Clinical studies have demonstrated that betahistine 48 mg daily administered for 3 months is an effective and safe option for the treatment of peripheral vertigo. The 4 decades of use of betahistine have proven the excellent safety profile of betahistine with the usual dose range up to 48 mg daily.[17]

This study has few limitations. The current paper is based on the opinions of 43 Indian expert Neurologists. It does not represent the entire population of neurologists across India. The expert opinions in this paper are based on their observations in their practice in the real-world setting. Large, well-designed multicentric trials are warranted to confirm the observations of the expert neurologists.

CONCLUSION

Residual dizziness post-repositioning maneuvers is dizziness/sensation of imbalance without the spinning. 10-25% of patients have residual dizziness post-repositioning maneuvers. Betahistine in the dose of 48 mg/day administered for at least 3 months is essential to ensure vestibular compensation, reduce recurrence, and residual dizziness. Betahistine is effective and safe even in elderly patients with residual dizziness.

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