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Original Research Article

Effective management of peripheral vertigo due to benign paroxysmal positional vertigo with betahistine, in the real-world setting: an expert survey with ENT specialists in India

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ABSTRACT

Background: Benign paroxysmal positional vertigo (BPPV) commonly causes peripheral vertigo and is treated with canalith repositioning maneuvers (CRM). Yet, a subset of patients continues to experience vertigo called residual dizziness after undergoing CRM. Objective was to understand the role of betahistine 48 mg per day in prevention of recurrent vertigo and prevention of residual dizziness in patients with BPPV based on expert perceptions.
Methods: Forty ear, nose and throat (ENT) specialists or otolaryngologists from diverse regions across India who were treating patients with peripheral vertigo were invited to participate in an online survey regarding their approach to treating peripheral vertigo in the real-world setting.
Results: 23 respondents (57%) reported that 10-25% of their patients had recurrence of vertigo. 24 respondents (60%) opined that both impaired vestibular compensation due to insufficient dose (less than 48 mg/day) and duration (less than 3 months) of betahistine and remnant otoliths cause recurrence of vertigo. 57% participants adopted this approach to prevent residual dizziness namely: 1) increase dose of betahistine to 48 mg/day and 2) increase the duration of use of betahistine to 3 months. 40% physicians opined that 75-90% reduction in vertigo episodes is seen with 48 mg per day of betahistine.
Conclusions: Betahistine is preferred to treat peripheral vertigo due to BPPV. Betahistine is prescribed in the dose of 48 mg per day for a duration of at least 3 months post repositioning manoeuvres effectively reduces vertigo, reduces recurrence and residual dizziness by facilitating vestibular compensation and improved vestibular blood supply.

Keywords: Betahistine, BPPV, Canalith repositioning maneuvers, Recurrence, Residual dizziness

INTRODUCTION

Benign paroxysmal positional vertigo (BPPV) is the leading cause of peripheral vertigo.[1] The prevalence of BPPV is estimated to be 10.7-64 per 100 000 people, and the lifetime prevalence is about 2.4%[1] BPPV can occur at any age, but its prevalence increases with increasing age and recurrence rates of BPPV are estimated to be about 15–20% per year.[2-4] The canalith hypothesis postulates that BPPV is caused by free otoconia dislodging from the utricular macula and entering the semicircular canal, which promotes inappropriate flow of endolymph whenever the head is rotated in the plane of the affected canal.[5,6] The canalith repositioning maneuvers (CRM), such as the Epley manoeuvre or Semont's liberatory manoeuvre, can be used to treat posterior canal BPPV. CRM is the first line of treatment adopted for the management of vertigo due to BPPV.[7,8] The canalith repositioning maneuvers (CRM) is performed to reposition the displaced particles from the affected canal to their original and relieve vertigo.[9] Yet, a subset of patients continues to experience vertigo for some period of time

after undergoing repositioning maneuvers. This is termed residual dizziness.[10-12]

Patients with residual dizziness present symptoms such as a non-specific sensation of unsteadiness, light-headedness, disorientation, fogginess, or drowsiness.[13] Residual dizziness can have an adverse impact on the quality of life of the patient. The prevalence of residual vertigo ranges from 31% to 61%. The risk factors for residual dizziness are aging, female gender, long duration of BPPV, number of canalith repositioning maneuvers (CRM), cervical vestibular evoked myogenic potential (VEMP), and ocular VEMP abnormalities.[14]

There is no consensus about the approach to effectively manage residual dizziness after successful CRM in patients with BPPV. Betahistine is the most widely used medication prescribed to relieve and prevent residual dizziness. The dual effects of betahistine, such as increasing labyrinthine microcirculation and suppression of the increased neuronal activity in vestibular receptor cells, afferent neurons, and vestibular nuclei, are postulated to relieve vertigo and residual dizziness.[15] At least 3 months of betahistine in the dose of 48 mg/day is essential to ensure vestibular compensation and reduce recurrence and residual dizziness in a case of BPPV.[16]

The central histaminergic system helps in the regulation of vestibular function.[17] Antihistamine drugs are used to treat vertigo, but they cause sedation and may cause falls in elderly patients with vertigo. Betahistine hydrochloride is a structural analog of histamine, which is effective in the management of peripheral vertigo.[18] Betahistine is devoid of sedative effects.[18,19] Betahistine can be given after the repositioning maneuver to decrease the occurrence of residual dizziness.

Aims

To understand the role of betahistine in the prevention of recurrent vertigo and the prevention of residual dizziness in patients with BPPV. To ascertain whether 48 mg per day of betahistine was the preferred dosage in patients with peripheral vertigo due to BPPV. To understand expert perceptions about the appropriate duration of therapy of betahistine in patients with peripheral vertigo and residual dizziness.

METHODS

40 ear, nose and throat (ENT) specialists or otolaryngologists from diverse regions across India who were treating patients with peripheral vertigo were invited to participate in this survey regarding their approach to treating peripheral vertigo in the real-world setting. The experts were invited to participate in an online QR based survey during May 2024 - July 2024. The questionnaire was prepared based on a literature review done using the Medline database. Questionnaires were incorporated in Microsoft form that access results mainly by real time analysis from the responses submitted and results can be graded as individual responses through charts and graphs within the Microsoft forms interface. The questionnaire was developed following discussions and inputs from Senior specialists in an expert group meeting conducted for vertigo. The authors were a part of the validation process. 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. The response to the questions were chronicled based on opinions of the experts.

Table 1: Demographic distribution of experts.

Regions of India	Number of experts
North India	4
South India	12
West India	8
East India	11
Central India	6

RESULTS

Observations from the online QR code-based survey

What is a recurrence of vertigo?

About 30 respondents (75%) opined that the ‘spinning' sensation in vertigo re-experienced by the patient is recurrent vertigo. However, 10 respondents (25%) differed in their opinion; they stated that patients manifesting any symptoms such as nausea, vomiting, dizziness, or imbalance but not necessarily spinning could be defined as recurrent vertigo.

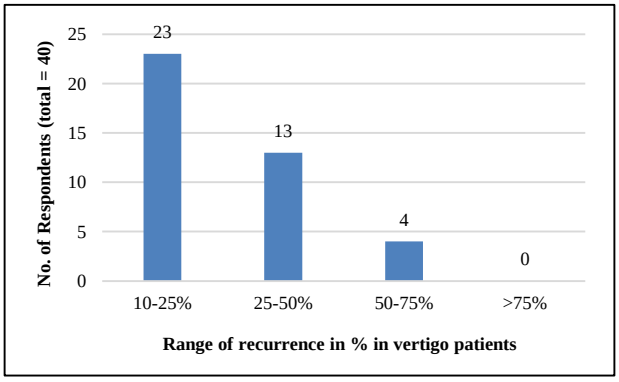

Figure 1: Recurrence of vertigo.

How common is the recurrence of vertigo in your practice?

Most practitioners, i.e., 23 respondents (57%), experience a recurrence rate of 10-25% in their practice, while 13

respondents (32%) observe a higher rate between 25-50%. 4 respondents (10%) opined recurrence of vertigo in the range of 50-75%.

What is the cause of recurrence, according to you?

24 respondents (60%) opined that both impaired vestibular compensation due to insufficient dose (less than 48 mg/day) and duration (less than 3 months) of betahistine and remnant otoliths cause recurrence of vertigo (Table 2).

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

23 respondents (57%) opined that a two-pronged approach is followed to reduce the recurrence of vertigo, namely: 1) increase the dose of betahistine to 48 mg/day and 2) increase the duration of use of betahistine to 3 months. About 13 respondents (32 %) opined that increasing the dose of betahistine to 48 mg/day alone is sufficient, while only 4 respondents (10%) said that increasing duration alone is adequate to manage recurrence.

Table 2: Causes of recurrence of vertigo.

	Impaired vestibular compensation due to insufficient dose (less than 48 mg/day) and duration (less than 3 months) of betahistine	Remnant otoliths	Both impaired compensation and remnant otoliths
Respondents No.	1	15	24
%	3	37	60

Why do you think there is lesser recurrence seen in patients on betahistine?

28 respondents (70%) opined that betahistine has dual actions for decreasing recurrent vertigo namely: 1) better vestibular compensation and 2) improved vestibular blood supply. 7 respondents (17%) said that betahistine caused majorly better vestibular compensation and thus reduced recurrent vertigo.

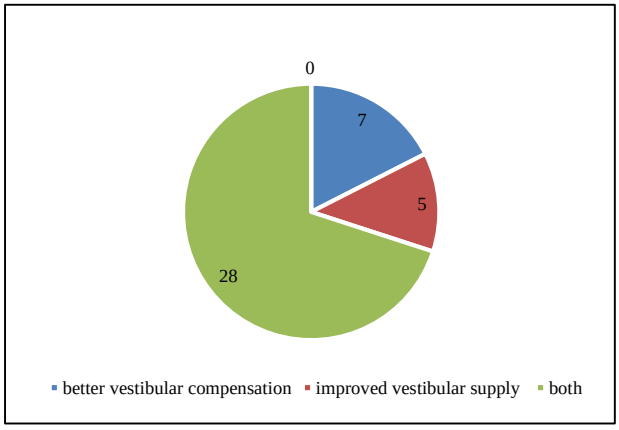

Figure 2: Reasons for lesser recurrence with betahistine.

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

16 respondents (40%) opined that a 75-90% reduction in vertigo episodes is seen with 48 mg per day of betahistine. In comparison, 8 other respondents (20%) opined that more than a 90% reduction in vertigo episodes is seen with 48 mg per day of betahistine (Figure 3).

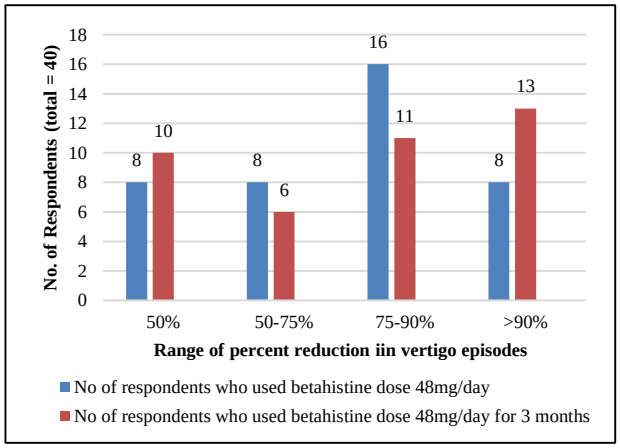

Figure 3: Percent reduction in episodes of vertigo/recurrence.

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

13 respondents (32 %) opined that a reduction of more than 90% in vertigo episodes is seen with 48 mg per day of betahistine prescribed for 3 months (Figure 3).

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

30 respondents (75%) opined that all factors, including the dose-dependent effect of betahistine, improved vestibular blood supply, and vestibular compensation, contributed to the lesser recurrence of vertigo when betahistine was given at 48 mg/day for 3 months. Additionally, 6 respondents (15%) opined that betahistine has a dose-dependent effect on reducing the recurrence of vertigo.

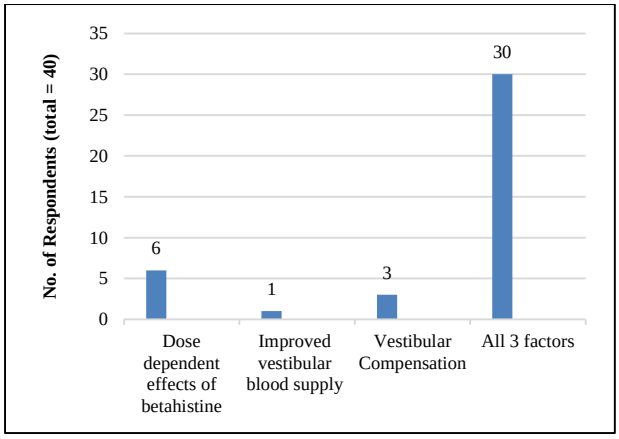

Figure 4: Cause of reduction of recurrent vertigo after treatment with betahistine.

What is residual dizziness?

29 respondents (72%) opined that residual dizziness is manifested as imbalance/dizziness which is experienced by the patient post maneuvers without the spinning.

How common is residual dizziness in your practice?

25 respondents (62%) opined that residual dizziness is observed in about 10-25% of their patients, 11 respondents (27%) opined that 25-50% of their patients had residual dizziness, while 2 respondents (5%) mentioned that 50-75% patients had residual dizziness. Also, the other 5 respondents (5%) opined that more than 75% had residual dizziness.

What is the cause of residual dizziness?

20 respondents (50%) opined that impaired vestibular compensation due to insufficient dose (less than 48 mg/day) abd duration (less than 3 months) of betahistine and remnant otoliths were responsible for residual dizziness. About 16 respondents (40%) opined that residual dizziness could be attributed to the presence of otoconia alone.

What do you do to betahistine regimen to reduce/avoid residual dizziness?

25 respondents (62%) opined that to reduce/avoid residual dizziness, they preferred to Increase the dose of betahistine to 48 mg/day and increase the duration of use of betahistine to 3 months. About 10 respondents (25%) opined that they increased the dose of betahistine to 48 mg/day.

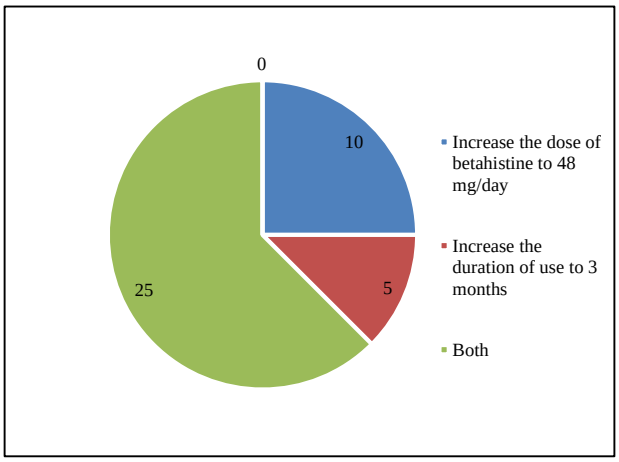

Figure 5: Betahistamine regimen to reduce residual dizziness.

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

31 respondents (77%) opined that better vestibular compensation and improved vestibular blood supply could lead to lesser residual dizziness (Table 3).

Table 3: Causes of reduced residual dizziness after treatment with betahistine 48 mg per day for 3 months.

	Both better compensation and improved blood supply	Better vestibular compensation	Improved vestibular blood supply
Respondents No.	31	6	3
%	77	15	7

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

11 respondents (27%) opined that 75-90% reduction in residual dizziness. More than 90% reduction of residual dizziness was reported by 14 respondents (35%) when betahistine is used in the optimal dose of 48 mg/day (Figure 6).

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

After 3 months of betahistine 48 mg per day therapy,19 respondents (47%) opined that they observed more than a 90% reduction in residual dizziness, while 10 respondents (25%) reported a 75-90% reduction in residual dizziness (Figure 6).

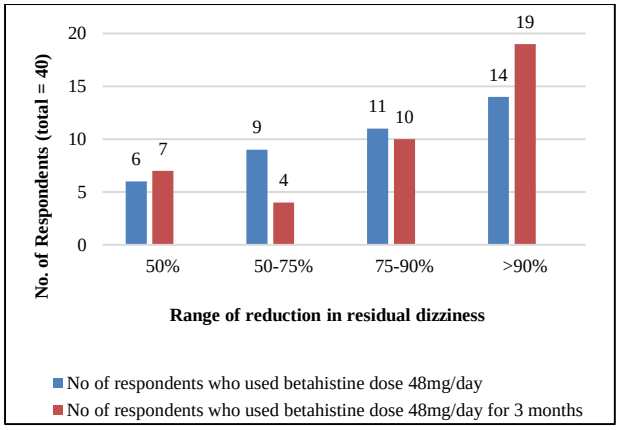

Figure 6: Reduction in residual dizziness.

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

32 respondents (80%) opined that improved vestibular compensation due to the improved blood supply and dose-dependent effect of betahistine were both responsible for the reduction in residual dizziness after 48 mg per day of betahistine therapy when given for 3 months.

DISCUSSION

The cornerstone of treatment of posterior canal BPPV is the appropriate and timely use of Epley or Semont maneuvers. They help to remove the otoliths from the semicircular.[20-23] A substantial proportion of patients treated with repositioning maneuvers continue to experience dizziness after maneuvers. This residual dizziness significantly increases the risk of falls and impairs the quality of life of these patients.

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.[24] The risk factors for RD after successful CRM in BPPV patients include elderly, female gender, comorbidities, low vitamin D levels, and long duration of BPPV before treatment.[25]

Betahistine has been approved in more than 80 countries as a first-line treatment for peripheral vertigo.[26] Several studies have demonstrated that the use of betahistine 48 mg per day effectively reduces the occurrence of residual dizziness if prescribed immediately after performing the repositioning maneuvers.

Betahistine reduces symptoms of residual dizziness by rebalancing the vestibular nuclei neurons through actions on the histamine H1, H2, and H3 receptors.[18,27] The beneficial effects of betahistine could be attributed to the dual effects of increased brain arousal, improved labyrinthine microcirculation, and increased local vestibular blood flow caused by relaxation of the pre-capillary sphincters of the microcirculation in the inner ear.[28] Betahistine helps functional recovery/behavioral adaptation in patients with vertigo.[18,29,30] Betahistine has been postulated to increase histamine turnover and release and modulate the release of other neurotransmitters, such as GABA. These effects lead to improved late-stage vestibular compensation. Betahistine also aids in improving the rebalancing of the neuronal activity of the vestibular nuclei complexes on both sides. Betahistine accelerates functional recovery in patients with peripheral vertigo caused by BPPV.[28]

Several clinical studies have proved that the effectiveness of betahistine is dose dependent. These clinical trials have demonstrated that 48 mg per day of betahistine is effective for treating peripheral vertigo due to BPPV. This dose of 48 mg per day reduces vertigo, reduces the frequency and intensity of attacks, facilitates vestibular compensation, improves quality-of-life, and prevents new episodes of vertigo.[28] Betahistine has been proven to be more effective than dimenhydrinate in improving RD symptoms in patients with benign paroxysmal positional vertigo (BPPV) after successful Epley maneuver.[31]

This QR code mediated online survey results have reiterated the efficacy of betahistine 48 mg per day in reducing residual dizziness in patients with vertigo due to BPPV. The respondents of the survey (66%) opined that a significant proportion of patients have about 50 to 75% reduction in vertigo after increasing the dose of betahistine to 48 mg/day for a duration of 3 months.

The limitations of this study are the fact that it is expert opinion and experience based. A well-designed clinical trial needs to be conducted to corroborate the opinions of the experts. secondly the study included only 40 experts. A larger number of experts need to be involved in the survey.

CONCLUSION

In the real-world setting, a significant proportion of patients with vertigo due to BPPV continue to experience residual dizziness after undergoing treatment with repositioning maneuvers. The current real-world online survey of experts treating vertigo has indicated that betahistine is the preferred drug used to treat peripheral vertigo due to BPPV. Betahistine is prescribed in the dose of 48 mg per day for a duration of at least 3 months post repositioning maneuvers. Betahistine, in the dose of 48 mg/day administered for at least 3 months, effectively reduces vertigo, reduces recurrence and residual dizziness by facilitating vestibular compensation, and improves vestibular blood supply. Betahistine 48 mg per day has been proven to relieve vertigo and improve the quality of life of patients with peripheral vertigo. The majority of specialists in the survey observed that betahistine, in a dose of 48mg/day for 3 months, showed more than a 90% reduction in residual dizziness in patients with vertigo.

Betahistine is effective for the management of vertigo and recurrent vertigo and for improving the outcomes of repositioning maneuvers.

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