

TREATMENT OF BENIGN POSITIONAL PAROXYSMAL VERTIGO AT TERTIARY CARE TEACHING HOSPITAL

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Received : 01/01/2023
 Received in revised form : 19/02/2023
 Accepted : 04/03/2023

Keywords:

Benign paroxysmal positional vertigo,
 Cross Sectional, Nystagmus,
 Sensorineural Hearing Loss.

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DOI: 10.47009/jamp.2023.5.2.175

Source of Support: Nil,
 Conflict of Interest: None declared

Int J Acad Med Pharm
 2023; 5 (2); 831-834



Abstract

Background: Benign paroxysmal positional vertigo (BPPV) is the most frequent vestibular disorder with significant morbidity, psychosocial impact, and medical costs. This study aimed to review the clinical features, treatment, and outcomes of BPPV in tertiary care teaching hospital India. **Materials and Methods:** A cross sectional survey with was conducted over a period of 2 months at tertiary care teaching hospital India. A cross sectional survey with was conducted over a period of 2 months at tertiary care teaching hospital India. Nystagmus observed with the aid of video-nystagmography or Frenzel goggles in most of the cases. Posterior semicircular canal BPPV (PSC-BPPV) was diagnosed by Dix-Hallpike test. Data analyzed using SPSS software. **Result:** Vertigo was associated with nausea and vomiting in 62 patients (31%). Tinnitus was complained in 52 patients (26%), diminution of hearing in 44 patients (22%), otalgia in 7 patients (3.5%) and headache in 4 patients (2%) Audiological examination by pure tone audiometry (PTA) revealed normal hearing in 84 patients (73.7 %), while 24 patients had a high-frequency sensorineural hearing loss (SNHL) (21%), 2 patients had mid-frequency mixed hearing loss (1.75%), and 4 patients had severe SNHL (3.5%). Response to repositioning maneuver, 98 patients (86%) respond after one session and 16 patients (14%) (4 with co-morbidity and 12 without) (10 has posterior canal and 6 other canal affection) improved after 2 sessions. **Conclusion:** This study shows showed that careful and meticulous history with full clinical and audiological assessment of BPPV patients as well as choosing the appropriated provocation test which help not only the diagnosis but also identify the type of BPPV, and so applying the appropriated suitable repositioning maneuver will help in management of BPPV.

INTRODUCTION

According to the international classification of vestibular disorders, vertigo is defined as an illusion of movement, generally rotating, either of oneself or of the environment, associated with feelings of instability. Depending upon the location of the lesion in the vestibular system or in the higher centers of the body, it can be classified as central or peripheral, of which BPPV is the most common peripheral vestibular disorder. Benign paroxysmal positional vertigo (BPPV) is a common vestibular disorder leads to significant morbidity, psycho-social impact, and medical costs. It is the most frequent cause of a vestibular disorder and represents about 20–30% of the vestibular vertigo with a lifetime prevalence reaches up to 2.4% in the general population.^[1]

The time course of BPPV is characterized by spontaneous remissions that occur typically after

days to weeks and recurrences that occur in about 50% of patients.^[2,3] Although BPPV is usually self-limiting, it inflicts a considerable personal and socioeconomic burden. BPPV is categorized according to its cause into primary which is usually idiopathic and secondary. The primary type is the commonest type. The chief causes of secondary BPPV are after ear surgery, trauma to the head, vestibular neuronitis, insufficient blood supply of the vestibulobasilar system, and metabolic disorders.^[3,4]

The two main hypotheses, which explain the development of BPPV, are the cupulolithiasis theory and canalolithiasis theory. Cupulolithiasis theory is based on the attachment of otolithic debris to the cupula in the crista ampullaris while the canalolithiasis theory is based on the presence of free-floating debris in the lumen of the semicircular canals (SCC).^[5] The management of BPPV has changed dramatically in the past 20 years as our

understanding of the condition has progressed. The most accepted treatment method for the disease is canalith repositioning procedures (CRPs). The aim of canalith repositioning maneuver is to send the otoconia back to the utricle through mobilization with correct head movements.^[6] Betahistine, a histamine analog, is also gaining popularity in the treatment of BPPV because of its neurochemical, microcirculatory activity and multi-factorial mode of action.

Thus, this study aimed to review the clinical features, treatment, and outcomes of BPPV in tertiary care teaching hospital India.

MATERIALS AND METHODS

A cross sectional survey with was conducted over a period of 2 months at tertiary care teaching hospital India. All participating specialists provided a written consent before participating in the survey. All the patients were subjected to a full and detailed history, general and clinical ENT examination, position provocation tests, and audiological assessment. Patients with congenital ear anomalies or ear malignancies are excluded from the study. The symptoms were clearly documented using the same criteria of Brevern et al⁷ to diagnose the vestibular vertigo and BPPV

In Benign paroxysmal positional vertigo (A–D has to be fulfilled): (A) Recurrent vestibular vertigo. (B) Duration of the attack is less than 1 min. (C) Symptoms always evoked by change of head position as turning over in the supine position, lying down, recline the head, rising from supine position, or leaning forward. (D) Not another disorder. This study included 200 patients who were diagnosed as BPPV.

BPPV in all patients was diagnosed by the above symptoms plus at least one positive test of Dix–Hallpike test, supine roll test, and deep midline head-hang test. The test was considered positive when subjective vertigo was reported by the patient, and objective nystagmus was observed by the examiner. Nystagmus observed with the aid of video-nystagmography or Frenzel goggles in most of the cases. Posterior semicircular canal BPPV (PSC-BPPV) was diagnosed by Dix–Hallpike test when a geotropic, torsional, upbeat nystagmus was observed associated with subjective vertigo while the affected ear down. Horizontal semicircular canal BPPV (HSC-OBPPV) was diagnosed by supine roll test when horizontal nystagmus was observed associated with subjective vertigo. It was considered geotropic if nystagmus beat toward the ground while the affected ear down and apogeotropic if nystagmus beat away from the ground while the affected ear up. Laterality was decided based on which side elicited more robust nystagmus and vertigo symptoms in cases where nystagmus and vertigo were present while either ear down. Anterior semicircular canal BPPV (ASC-BPPV) was

diagnosed if apogeotropic, torsional, downbeat nystagmus was noticed while the affected ear up during the Dix–Hallpike test and/or downbeat nystagmus was noticed in the deep midline head-hang position.

Secondary BPPV was identified when a patient informs a history of acute unilateral vestibular loss or trauma to the head or surgery to the ear within 6 months of the onset of BPPV or intubation for general anesthesia within 3 days earlier. All the patients are subjected to repositioning maneuver according to the affected canal. After 2 weeks, if any of these patients is still complaining from vertigo, the patient subjected to the 2nd repositioning maneuver while using the oscillation on the mastoid. There are fixed instructions which are instructed to the patients to be followed in the first week after doing the repositioning maneuver either in the first or in the second attempt. The patient is considered not responding to the rehabilitation if after 6 weeks the patient is still having vertigo as well as a positive provocation test with the characteristic nystagmus.

Statistical Analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). For all tests, confidence level and level of significance were set at 95% and 5% respectively.

RESULTS

This study included 200 patients who were diagnosed as BPPV: 96 (48%) females and 104 (52%) males. Their age ranged from 24 to 70 years; mean±SD (44.50±10.20) years. The main complaint was false rotation sensation (vertigo) in 192 patients (96%) while 7 patients complained of imbalance (3.5%). Vertigo was associated with nausea and vomiting in 62 patients (31%). Tinnitus was complained in 52 patients (26%), diminution of hearing in 44 patients (22%), otalgia in 7 patients (3.5%) and headache in 4 patients (2%). (Table 1) Associated diseases that were documented with BPPV were reported in 42 patients (21%) including diabetes mellitus in 21 patients (10.5%), hypertension in 10 patients (5%), diabetes and hypertension in 8 patients (4%), hypothyroidism in 3 patients (1.5%), cataract in 3 patients (1.5%), and head trauma in 4 patients (2%) Recurrent BPPV was reported in 38 patients (19%). Otoscopic examination showed normal tympanic membrane (TM) in 174 patients (87%) while TM appeared dull in 18 patients (9%), retracted in 4 patients (2%), and perforated in 4 patients (2%) (Table 2). Audiological examination by pure tone audiometry (PTA) revealed normal hearing in 144 patients (72 %), while 42 patients had a high-frequency sensorineural hearing loss (SNHL) (21%), 7 patients had mid-frequency mixed hearing loss (3.5%), and 8

patients had severed SNHL (4%) (Table 2). The tympanometry was found type A in 190 patients (95%), type B in 7 patients (3.5%), and perforated in 3 patients (1.5%)

Dix Hall Pike gave up beating torsional nystagmus in 186 (93%) patients and down beating nystagmus in 7 (3.5%) patients and negative in 7 (3.5%) patients. Supine roll test was negative in 192 (96%) patients and left geotropic nystagmus in 8 (4%) patients where the Dix Hall Pike was negative. Deep midline head-hang position shows downbeat nystagmus in 7 (3.5%) patients.

The canal affected was the posterior canal in 186 (93%) and the horizontal canal in 7 (3.5%) patients and the anterior canal in 7 (3.5%) patients. The side affected was the 98 canal in the right side, and 102 canals were affected on the left side. No bilateral

canal affection was recorded. The side affected in the four horizontal canal patients was left side, where the sides affected in four anterior canal patients were two left sides and two right sides. Regarding the severity, vertigo was severe in 42 patients (21%), moderate in 88 patients (44%), and mild in 70 patients (35%). The four affected horizontal canals showed a severe form while in the affected 4 anterior canals, two were mild and the other two were moderate.

Response to repositioning maneuver (Epley maneuver in cases of PSC-BPPV, Barbeque maneuver in HSC-BPPV, and deep midline head-hang maneuver in ASC-BPPV); 172 patients (86%) respond after one session and 28 patients (14%) improved after 2 sessions.

Table 1: Clinical features of the patients

Variable	Number	Percentage (%)
Gender		
Male	104	52
Female	96	48
Age		
Mean	44.50±10.20	
Co morbidity		
Number of patients	42	21
Diabetes	21	10.5
Hypertension	10	5
Diabetes & hypertension	8	4
Hypothyroidism	3	1.5
Cataract	3	1.5
Head trauma	4	2
Symptoms		
Vertigo	192	96
Imbalance	7	3.5
Nausea and Vomiting	62	31
Tinnitus	52	26
Diminution of hearing	44	22
Otalgia	7	3.5
Headache	4	2
Recurrent BBPV	38	19

Table 2: Otoloscopic, audiological, and vestibular assessments of the patients

Variable	Number	Percentage (%)
Otosopic examination		
Normal tympanic membrane	174	87
Dull	18	9
Retracted	4	2
Perforated	4	2
Pure tone audiometry		
Normal hearing	144	72
High-frequency hearing loss	42	21
Sever SNHL	8	4
Mid-frequency SNHL	7	3.5
Tympanometry		
Type A	190	95
Type B	7	3.5
Perforated	3	1.5
Dix Hall Pike		
Upbeating torsional nystagmus	186	93
Down beating torsional nystagmus	7	3.5
Negative	7	3.5

DISCUSSION

BPPV is the most common vestibular disorder.^[8,9] BPPV is popularly believed to be due to small

cupular deposits that cause endolymph to deflect the cupula and stimulate the hair cells. This faulty stimulation causes the sensation of vertigo in BPPV. BPPV is characterized by sudden episodes of

dizziness that occur with the movement of the head. This condition more commonly emerges between the fifth and seventh decades of a person's life and tends to occur at higher rates in women than in men.^[10] Furthermore, given that BPPV occurs most commonly in the second half of the life span, patients suffering from BPPV often have medical comorbidities that may impact the management of BPPV.^[11]

In this study, the patients age ranged from 24 to 70 year with nearly equal presentation in males and females like studies of Suarez et al.^[12] and Sacco et al.^[13]; however, in the study of Brevern et al.^[7] there was a female predominance.

Only 2% (4 patients) are secondary BPPV, and the remaining 98% (196 patients) are primary idiopathic. The associated diseases with BPPV were reported in 42 patients (21%); diabetes mellitus in 21 patients (10.5%), hypertension in 10 patients (5%), diabetes and hypertension in 8 patients (4%), hypothyroidism in 3 patients (15%), cataract in 3 patients (15%), and head trauma in 4 patients (2%). The left side showed slightly more affection than the right while previous studies have found that BPPV affects predominantly the right labyrinth more than the left.^[14] It has also been documented that a significant correlation has been found between position of the head during sleep and the affected side by BPPV.^[15]

In the study of Babac and Arsović.^[16], the result of initial Epley maneuver was 90.7% after first Epley maneuver, and 96% after the second. In the study of Panuganti et al.^[17] 68% patient showed an improvement in symptoms after first Epleys maneuver, and 88% after the 2nd time. In the study of Korres et al.^[18] the canalith repositioning procedure was immediately successful in 80.9% patients in a second session, resulting in a total success rate of 92.1%.

However, in this study, the success rate after the first repositioning maneuver was 86% and after the second repositioning maneuver the success rate was 100% and this is mostly due to the accuracy in diagnosing which canal is affected and hence choosing the appropriate repositioning maneuver. Epley maneuver was used in cases of PSC-BPPV, barbeque maneuver was used in HSC-BPPV, and deep midline head-hang maneuver was used in ASC-BPPV. Limitation of the study was sample size of participants was low.

CONCLUSION

This study shows showed that careful and meticulous history with full clinical and audiological assessment of BPPV patients as well as choosing the appropriated provocation test which help not only the diagnosis but also identify the type of BPPV, and so applying the appropriated suitable

repositioning maneuver will help in management of BPPV.

REFERENCES

1. Von Brevern M, Radtke A, Lezius F, Feldmann M, Ziese T, Lempert T, Neu hauser H (2007) Epidemiology of benign paroxysmal positional vertigo: a population based study. *J Neurol Neurosurg Psychiatry* 78(7):710–715.
2. Imai T, Ito M, Takeda N, Uno A, Matsunaga T, Sekine K, Kubo T (2005) Natural course of the remission of vertigo in patients with benign paroxysmal positional vertigo. *Neurology* 64(5):920–921.
3. Moreno NS, André AP (2009) Number of maneuvers need to get a negative Dix -Hallpike test. *Braz J Otorhinolaryngol* 75(5):650–653.
4. Caldas MA, Ganança CF, Ganança FF, Ganança MM, Caovilla HH (2009) Clinical features of benign paroxysmal positional vertigo. *Braz J Otorhinolaryngol* 75:502–506.
5. Fife TD, Iverson DJ, Lempert T, Furman JM, Baloh RW, Tusa RJ et al. Practice parameter: therapies for benign paroxysmal positional vertigo (an evidencebased review): Report of the quality standards subcommittee of the american academy of neurology. *Neurology* 2008;70(22):2067–74.
6. Kim J-S, Zee DS. Clinical practice. Benign paroxysmal positional vertigo. *N Engl J Med*. 2014;370(12):1138–47.
7. Von Brevern M, Radtke A, Lezius F, Feldmann M, Ziese T, Lempert T, Neu hauser H (2007) Epidemiology of benign paroxysmal positional vertigo: a population based study. *J Neurol Neurosurg Psychiatry* 78(7):710–715.
8. Parnes LS, Nabi S. The diagnosis and management of benign paroxysmal positional vertigo. *Semin Hear*. 2009;30(4):287–305.
9. Neuhauser HK. Epidemiology of vertigo. *Curr Opin Neurol*. 2007;20(1):40–6.
10. Helminski JO, Zee DS, Janssen I, Hain TC. Effectiveness of particle repositioning maneuvers in the treatment of benign paroxysmal positional vertigo: A systematic review. *Phys Ther*. 2010;90(5):663–78.
11. Lawson J, Johnson I, Bamio DE, Newton JL. Benign paroxysmal positional vertigo: Clinical characteristics of dizzy patients referred to a Falls and Syncope Unit. *QJM-Mon J Assoc Physicians*. 2005;98(5):357–64.
12. Suarez H, Alonso R, Arocena M, Suarez A, Geisinger D (2011) Clinical characteristics of positional vertigo after mild head trauma. *Acta Otolaryngol* 131(4):377–381.
13. Sacco RR, Burmeister DB, Rupp VA, Greenberg MR (2014) Management of benign paroxysmal positional vertigo: a randomized controlled trial. *J Emerg Med* 46(4):575–581.
14. von Brevern M, Seelig T, Neuhauser H, Lempert T (2004) Benign paroxysmal positional vertigo predominantly affects the right labyrinth. *J Neurol Neurosurg Psychiatry* 75(10):1487–1488.
15. Shim DB, Kim JH, Park KC, Song MH, Park HJ (2012) Correlation between the head-lying side during sleep and the affected side by benign paroxysmal positional vertigo involving the posterior or horizontal semicircular canal. *Laryngoscope* 122(4):873–876.
16. Babac S, Arsović N (2012) Efficacy of Epley maneuver in treatment of benign paroxysmal positional vertigo of the posterior semicircular canal. *Vojnosanit Pregl* 69(8):669–674.
17. Panuganti A, Loka SR, Tati S, Punga AK (2019) Comparative study of management of BPPV (Benign Paroxysmal Positional Vertigo) with only drugs versus drugs plus Epley manoeuvre. *Indian J Otolaryngol Head Neck Surg* 71(2):1183–1186.
18. Korres SG, Balatsouras DG, Papouliakos S, Ferekidis E (2007) Benign paroxysmal positional vertigo and its management. *Med Sci Monit* 13(6):C275–82.