International Journal of Otorhinolaryngology and Head and Neck Surgery
Josna JV et al. Int J Otorhinolaryngol Head Neck Surg. 2023 Sep;9(9):709-713
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937
DOI: https://dx.doi.org/10.18203/issn.2454-5929.ijohns20232520

Original Research Article

Effectiveness of Epley's maneuver alone without any drugs in the treatment of posterior canal benign paroxysmal positional vertigo - a prospective analytical study

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Received: 18 May 2023
Accepted: 21 July 2023

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ABSTRACT

Background: Posterior canal benign paroxysmal positional vertigo (p-BPPV) is the most common peripheral vestibular problem. Many doctors use three treatment options for p-BPPV: drugs alone, Epley's maneuver with drugs, and Epley's maneuver alone. Many studies say that Epley's maneuver with drugs improves the condition much more effectively than drugs alone. Our study is intended to assess the effectiveness of Epley's maneuver alone in treating posterior canal BPPV.
Methods: A prospective analytical study was performed on 102 patients who were divided into 2 groups after random sampling. Group I underwent repeated applications of Epley's maneuver alone, and group II underwent a single Epley's maneuver along with drugs. The data were collected systematically with the help of a proforma and dizziness handicap inventory (DHI) score chart. The patients were reviewed after 24 hours, 1 week, and 1 month.
Results: In our study, the mean pre-treatment DHI score of group I was 66.71, and group II was 64.39. After 24 hours, the DHI score came down to 46 and 47.61 respectively, and after 1 week and 1 month, it decreased to 33.06 and 22.86, respectively in group I and group II, it came to 44.71 and 38.78, respectively. The difference in mean DHI score between groups I and II is statistically significant, with each review having a p value of 0.00.
Conclusions: This study was able to demonstrate the efficacy of Epley's maneuver in the treatment of BPPV without any drug.

Keywords: BPPV, Epley's maneuver, Vertigo, DHI score, Dix-Hallpike test

INTRODUCTION

Benign paroxysmal positional vertigo (BPPV) is the most common peripheral vestibular disorder seen in emergency units and outpatient clinics of otorhinolaryngology, among them posterior canal BPPV (p-BPPV) is the most common cause. It is characterized by episodes of instantaneous vertigo and nystagmus, triggered by changes in the position of the head concerning gravity and the orientation of the semi-circular canal involved.[1] This occurs due to free-floating otoliths (canalithiasis) that cause the endolymphatic flow to be abnormal. Immobility and limitations in daily activities are the main concerns for this disease.[2,3] Characteristic medical history and nystagmus during provocation test - Dix Hallpike test (DHT) are used to diagnose BPPV.[4] In some patients, even though they report dizziness and have a characteristic BPPV history, nystagmus may not be observed during the Dix-Hallpike test. If there is an absence of nystagmus and the presence of vertigo during the Dix-Hallpike test with a positive history of BPPV, this phenomenon is called 'subjective BPPV' (S-BPPV).[5] Patients with S-BPPV constitute 12–48% of the total number of BPPV cases.[6,7] The recommended treatment of both subjective BPPV (S-BPPV) and objective posterior canal BPPV (p-BPPV) is the Epley maneuver.[5,8]

Canalolith repositioning (Epley's) maneuver is a procedure that takes the particles back to the utricle from where they had gone into the posterior semi-circular canal, causing vertigo. If all the particles had gone back to the utricle, then it is expected that the canal would not be stimulated improperly. Then, the patient will not have vertigo, and the disease will be pathologically and symptomatically cured.

Many doctors use three treatment options for PSCC BPPV: drugs alone, Epley's maneuver, and Epley's maneuver and drugs. Many studies say that Epley's maneuver improves the condition much more effectively than drugs alone.[9] Our study is intended to assess the effectiveness of Epley's maneuver alone, without any drugs, to see whether the patients are relieved of the disease, because the return of the particles can no longer cause an extra flow inside the canal. If drugs are not required in the treatment of posterior canal BPPV, it can avoid a lot of expenditure.

METHODS

In this prospective analytical study conducted over a period of one year from 01 August 2021 to 01 August 2022, we studied 102 patients who came to our hospital's ENT department with complaints of vertigo, whose Dix-Hallpike test was positive and who satisfied the inclusion criteria, were recruited to the study. Data were collected systematically using a proforma and dizziness handicap inventory (DHI) score chart after receiving informed written consent. The inclusion criteria include patients with vertigo who respond, positively to the Dix-Hallpike test and all patients with posterior canal BPPV who do not have a secondary cause, such as a CP angle tumour. The exclusion criteria include bilateral Dix-Hallpike-positive cases, patients presenting with other causes of vertigo that may mimic BPPV ex: Meniere's disease, hypertension, vestibular neuronitis, cerebellar diseases, stroke, vertebrobasilar insufficiency, cervical spondylosis, CNS disorders, and metabolic derangements. Patients who are on medications that may cause dizziness as a side effect of the drug. Contraindications for the position test (DHT) like neck surgery, cervical radiculopathy, severe rheumatoid arthritis, atlantoaxial and occipitoatlantial instability, aplasia of the odontoid process, carotid sinus syncope, vascular dissection syndrome, cervical spine stenosis, recent abdominal surgery, pregnancy third trimester, severe lumbar dysfunction, and spinal cord injuries are excluded from the study.

DHI scoring instructions

The DHI questionnaire method is one of the simplest and briefest methods of subjective assessment of the severity of vertigo. The patient is asked to answer each question as it pertains to dizziness or unsteadiness problems, specifically considering their condition during the last month. Questions are designed to incorporate functional (F), physical (P), and emotional (E) impacts on disability. To each item, the following scores can be assigned: no=0, sometimes=2, yes=4. 16-34 points (mild handicap), 36-52 points (moderate handicap), 54+ points (severe handicap).[10]

Random lots were taken and divided into groups I and II. Group I underwent Epley's maneuver up to three times, until DHT became negative in a single sitting. The Epley's maneuver begins with head is placed over the end of the table, 45 degrees to the side which DHT is positive (canaliths gravitate to center of PSC).While head is kept tilted downward, it is rotated to 45 degrees opposite side (canaliths reach common crus), head and body are rotated until facing downward 135 degrees from supine position (canaliths traverse common crus), while head is kept turned opposite side, patient is brought to sitting position (canaliths enter utricle), Head is turned forward, chin down 20 degrees (Figure 1).[11-14]

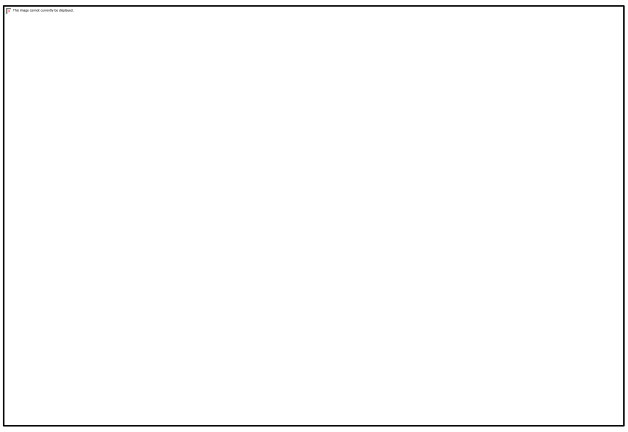

Figure 1: Demonstration of Epley's maneuver.

In more than 80% of cases, the Epley maneuver is effective in removing BPPV.[15] Studies show that the use of a mastoid vibrator improves the efficacy of the canal repositioning maneuver.

Post procedure instruction was given to all patients as, for 48 hours, patients are instructed not to lie supine and to sleep with their heads in 45° reclining position. All patients are told not to bend over, look up or down, or lie on the affected side for 7 days following the procedure. Patients are advised not to shake their heads while talking, showering, and brushing.

After 24 hours, a telephonic interview was done with the DHI score chart. If the score was greater than 52, it was considered as recurrence of the disease, and the patients were advised to return to the ENT OPD the following day for a repeat of Epley's maneuver. Next follow up through the telephonic review was done after 1 week and 1 month with the DHI score chart.

Group II underwent Epley's maneuver and received betahistine at a dose of up to 16 mg BD per day for 5 days. These patients were also reviewed over telephone with a DHI score chart after 24 hours, one week, and one month.

The score was recorded in each review. The results were analysed using IBM statistical package for the social sciences (SPSS) software.

RESULTS

On analysis, it is revealed that the two groups were comparable in terms of age, sex and symptoms of the disease.

Females were more common in 2 groups. Both groups had comparable age groups with a mean age of 51 years. All patients had giddiness and associated with nausea in 44% and vomiting in 34%. In our study, the right side was found to be more involved than the left. Out of 102 patients, the right side was involved in 65 patients and the left side was involved in 37 patients (Table 1).

Table 1: Patient characteristics in group I and II.

Variables	Group I (n=51)	Group II (n=51)
Mean age (year)	51.25	51.11
Sex (n [%])		
Male	17 (33.3)	23 (45.1)
Female	34 (66.7)	28 (54.9)

The mean pre-treatment DHI score of group I was 66.75 with a standard deviation of 5.5 and in group II was 64.39 with a standard deviation of 5.6. After 24 hours in group I, the mean DHI score came down to 46, after 1 week and after 1 month it decreased to 33.06 and 22.86 respectively. In group II after 24 hours, the mean DHI score came down to 47.61, after 1 week and 1-month mean DHI score came to 44.71 and 38.78 (Table 2).

Table 2: Comparisons of means of DHI scores before and after treatment at 24 hours, one week, and one month.

Parameters	N	Mean	Standard deviation	Mean difference	P value
Pre-treatment score					
Group I	51	66.75	5.556	2.353	0.923
Group II	51	64.39	5.615		
After 24 hours					
Group I	51	46	8.88	-1.608	0.000
Group II	51	47.61	4.271		
After 1 week					
Group I	51	33.06	6.601	-11.647	0.000
Group II	51	44.71	3.749		
After 1 month					
Group I	51	22.86	7.486	-15.922	0.000
Group II	51	38.78	11.476		

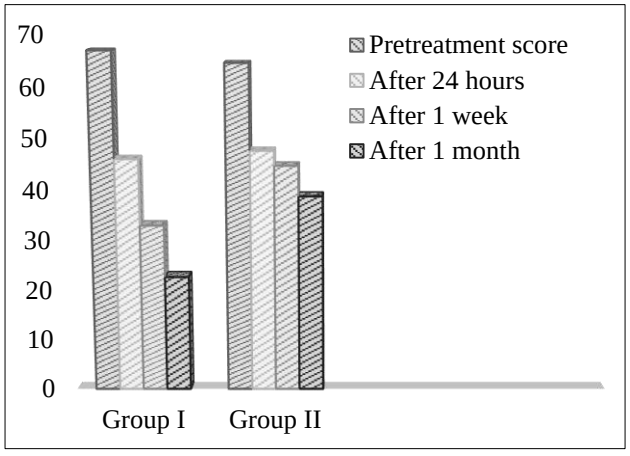

Figure 2: Bar diagram showing comparisons of means of DHI scores before and after treatment at 24 hours, one week, and one month.

The differences in the mean DHI score between group I and group II are: pre-treatment - 2.36 (66.75-64.39), after 24 hours - 1.61 (46-47.61), after 1 week - 11.65 (33.06-44.71), after 1 month - 15.92 (22.86-38.78), and the mean difference after 24 hours, 1 week and 1 month is statistically significant with a p value for each is 0.000.

Recurrence of the disease is considered when the DHI score is above 52 after 24 hours of Epley's treatment. Recurrence of benign paroxysmal positional vertigo was defined as relapse of vertigo after successful treatment. In our study, a total of 13 patients had a recurrence of the disease. Group I had 9 and group II had 4. In group, I, Epley's maneuver had to be repeated in 9 patients after 24 hours in view of persistent symptoms.

DISCUSSION

The most common cause of peripheral vertigo is BPPV. Current modalities of treatment for BPP include various vestibular rehabilitation excercise, pharmacological drugs and surgery in resistant cases. This study was conducted in two groups of 51 patients presenting with p-BPPV, where one group was treated with repeated Epley's maneuver and the other group was treated with Epley's maneuver along with pharmacological therapy (betahistine).

It is worth noting that the sample was relatively good (n=102) compared to those in other studies. There was a control group for comparison purposes.

In Bevern's study, the age-related cumulative incidence of BPPV increased from approximately 35 years of age, whereas it was very low at younger ages, and it was found to be more common in the age group of 31–60 years in the Epley's group and 31–40 years in the Epley's with Betahistine group.[16] In our study, the mean age was 51 years.

The sex distribution in this study concurs with the literature review, which suggests that BPPV is more common in females (60.8%), which is comparable to 62.5% in Epley et al. In our study, the right side was found to be more involved than left.

In our study, patients diagnosed with BPPV by the Dix-Hall Pike test were randomly divided into two groups: group I underwent Epley's maneuver alone, which was repeated in the same sitting up to 3 times until DHT is negative. In 1992, a study was conducted by Epley among patients with BPPV. Epley's maneuver was done on the patients with a positive Dix-Hallpike test, and a follow-up was done after 1 week. It shows a 90% cure rate after Epley's maneuver.[17] A systematic review of repeated application of Epley's maneuver for treating posterior canal BPPV done by Hendrik Reininik et al concluded that multiple maneuvers in a single sitting showed a rise in success percentages from 84% for 1 maneuver to 90% after 2 maneuvers and 92% after 3 maneuvers.[18]

In our study, we performed Epley's maneuver in a 5-position cycle, and the time for maintaining each head position was 1 minute without using a mastoid vibrator. Epley's study maintained five positions, and the timing for each position was the sum of the latency and duration of nystagmus and he also used mastoid vibrators.[17] Similarly, Lynn et al used five positions in Epley's exercise and held each position for the sum of latency and nystagmus duration.[19] Although various studies have been conducted to study the efficacy of mastoid vibrators used with Epley's maneuver, none have found any significant difference following the use of mastoid vibrators.[17]

In our study group II, we did a single Epley's maneuver along with betahistine. Almost all patients felt better for one week while on medication because the medications mask the symptoms, but majority of them experienced a relapse of symptoms after that. But Singh et al did a study titled "comparative effectiveness research: betahistine add-on therapy with Epley's maneuver versus Epley's maneuver alone in treating posterior BPPV patients" and concluded that betahistine therapy in conjunction with Epley's maneuver leads to better symptom control and is more effective than Epley's alone in treating BPPV patients.[20]

A study by Janpeet et al concluded that pharmacological therapy with betahistine, when used in conjunction with Epley's, is a safe modality of treatment. Betahistine can be used as the sole modality of treatment in patients of BPPV who are unfit to undergo canalolith repositioning maneuvers. It provides short-term relief for acute symptoms associated with BPPV by improving the microcirculation in the labyrinth and reducing the symptoms of vertigo. There may be a relapse of symptoms when used alone without canal repositioning maneuver.[21]

Our study both group showed decrease in DHI post treatment, but there were statistically significant differences in the mean DHI score between groups I and II after 24 hours, one week, and one month, (p value of 0.000 for each).

Among 102 patients in the present study, we did not see any case of posterior semicircular canal BPPV moving on to the anterior or horizontal canals after the maneuvers, which is in agreement with a study and disagreeing with the other study where conversion was found in 6.0% of the cases.[22,23]

CONCLUSION

Posterior canal BPPV is common among the elderly, with a mean age of 50 years and a sex predilection for women, and it affects the right side in the majority. This prospective analytical study comparing the treatment of posterior canal BPPV with repeated Epley's maneuver alone and Epley's maneuver with betahistine on 102 patients showed a significant difference in the mean DHI score between the two groups in reviews, which validates the efficacy of Epley's maneuver in the treatment of posterior canal BPPV without any drug. The use of drugs in BPPV may mask the symptoms of the disease without curing it. In some cases, Epley's maneuver must be applied several times in the same sitting or in repeated sitting to completely resolve symptoms. Majority of the patients recovered from the disease with their initial visit.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Josna JV, George MV, lhsan AT. Effectiveness of Epley's maneuver alone without any drugs in the treatment of posterior canal benign paroxysmal positional vertigo - a prospective analytical study. Int J Otorhinolaryngol Head Neck Surg 2023;9:709-13.