

Effectiveness of Epley's Maneuver in the Treatment of Benign Paroxysmal Positional Vertigo (BPPV)

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Objective: To evaluate the effectiveness of Epley's Maneuver in the treatment of BPPV.

Design: Retrospective study.

Methods: Twenty four patients who were fulfilling the presentation and clinical diagnosis of Benign Paroxysmal Positional Vertigo (BPPV), were seen in ENT clinic between March 2001 and June 2004, all were managed by Epley's Maneuver. A questionnaire was designed, stressing the various applicable issues to vertigo among which were the nature and duration of vertigo, its relevant symptoms, accompanying complaints and associated chronic medical illness. Additionally, we considered the effectiveness of Epley's Maneuver as reflected by the recurrence of symptoms, future need for labyrinthine sedatives, and the improvement in the patient's quality of life.

Results: Twenty-four patients were included in the study; males were 15 (62.5%), females 9 (37.5%). Their age ranged between 20 and 60 years (mean age = 42.7 years). All the patients were found to have normal ENT and CNS examination, except for a positive Dix-Hallpike test confirming the clinical suspicion of BPPV.

In Thirteen patients (54.1%), nausea and vomiting were found to be a common associated symptom, while five patients (20.8%) were found to have some other associated aural complaints. While all the patients had head positional changes as a trigger for the vertigo episode, some postural element was found in 15 patients (62%).

Thirteen patients (58%) were found not to have any associated chronic medical illness, 5 (21%) were diabetics, 6 (25%) were hypertensive, one (4%) was suffering from hyperlipidemia, and one patient (4%) was known to have ischemic heart disease. Positive history of head injuries was revealed in one patient (4%).

The patients scored the negative impact of vertigo on the quality of their life and their daily activity. Pre-Epley's, eleven patients (48%) gave a score of 10 (very badly affected), while post-Epley's maneuver 21 patients (88%) scored 0 (no effect at all on their life). Twenty-two patients (91.7%) revealed a significant improvement post-therapy.

Conclusion: In this study, we found that Epley's Maneuver is an effective and very efficient modality of treatment for BPPV.

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BPPV is a disorder of the labyrinthine function characterized by occurrence of paroxysms of vertigo and nystagmus on the adoption of certain provocative positions.

It was estimated that at least 20% of patients who present to the physician with vertigo have BPPV; however, because BPPV is frequently misdiagnosed, this figure may not be completely accurate, and probably underestimated, since BPPV can occur concomitantly with other inner ear disease, statistical analysis may be skewed toward lower number¹.

BPPV was described by Barany in 1921, who was the first to attribute the vertigo and nystagmus to otolith organs².

In 1952 Dix and Hallpike performed provocative positioning test, named in their honor³.

Harold Schuknecht proposed the cupulolithiasis (heavy cupula) theory as an explanation for BPPV, he thought that it is due to a degenerated otoconial mass embedded in the cupula of the posterior canal crista of the downmost ear. Through photomicrography, he demonstrated basophilic particles or densities that were adherent to the cupula. He postulated that the posterior semicircular canal (PSC) was rendered sensitive to gravity by these abnormal dense particles attached to or impinging upon the cupula, which keeps it from springing back to neutral position. This is reflected by the persistent nystagmus and explains the dizziness when a patient is tilted backward⁴.

House created a mathematical description of BPPV mechanics based on biophysical principles, in order to improve the physiopathological understanding of the most common varieties of the disorder, canalithiasis and cupulolithiasis. The cupulolithiasis model predicts a value of 0.69 micro g as the mass of particles contributing to the disorder. The canalithiasis model predicts a value of 0.087 micro g. These results support and expand our understanding of the mechanisms underlying the production of the cupulolithiasis and canalithiasis varieties of vertigo in humans⁵.

In 1980, Epley published his theory regarding Canalithiasis, postulating that BPPV symptoms are more consistent with free moving densities (canaliths) in the semicircular canals (posterior) than fixed densities attached to cupula¹. Soon after, he suggested a maneuver, involving sequential movements of head into four positions, aiming to move the otolith particles progressively from the posterior SCC back into the utricle².

The majority of the studies published about the outcome of Epley's maneuver reported that more than 80% success rate from the first attempt of Canal Repositioning Procedure (CRP)⁶.

BPPV was treated by physical therapy in 1980⁶. CPR was introduced by Semont in 1988 and by Epley's in 1992^{7,8}. Many studies, including randomized controlled studies, have reported success rates of more than 60% after a single session and more than 95% after three sessions⁹⁻¹⁴.

To improve the success rate slightly, it was recommended to lengthen the duration in each head position, increase the degree of head rotation or tilt with the movements, or by using vibrating objects over the temporal bone of the affected side. Additionally, a better outcome is said to be achievable by strict patient's compliance with the post-therapy instructions and possibly by repeating the procedure within one week of the initial therapy session in some selected cases.

Because BPPV is a commonly encountered underlying pathology for vertigo, and as Epley's maneuver is reported to be an effective yet overlooked modality of treatment of this disease entity, this study is aimed to investigate the effectiveness of this modality of treatment and its possible positive impact on the quality of life.

METHODS

Twenty-four patients who were fulfilling the presentation and clinical diagnosis of Benign Paroxysmal Positional Vertigo (BPPV), were seen in the ENT clinic between March 2001 and June 2004, and were managed by Epley's Maneuver.

Patients were diagnosed as BPPV based on clinical features and positive Dix-Hallpike test. Diagnostic workup included history, clinical and audiological examination to rule out any possible other underlying etiologies.

A questionnaire was designed stressing the various applicable issues to vertigo, among which were the nature and duration of vertigo, its relevant symptoms, accompanying complaints, and associated chronic medical illnesses. Additionally, we considered the effectiveness of Epley's Maneuver as reflected by the recurrence of symptoms, any future need for labyrinthine sedatives, and the improvement in the patient's quality of life subjectively. A scale was used from 0 to 10, where 10 is most severely affected and 0 is denoted for no deleterious effect on the quality of life or level of activity.

Epley's Maneuver was done for all the patients by ENT doctors. The maneuver involves sequential movement of the head, with systemic rotation so that the loose particles slide out of the posterior semicircular canal and back into the utricle.

The first step in Epley's maneuver is the Dix-Hallpike test, and if the rotatory nystagmus appears whether on the left or the right side the patient stays in the head hanging position with the affected ear hanging downward (head rotated 45 degrees and hyperextended) (Figure 1).

Fig 1

The second step is to rotate the patient head to the opposite side (unaffected ear directed downward) (Figure 2).

Fig 2

The third step is rolling the patient onto the body side of the unaffected ear, meanwhile the examiner rotates the patient's head until the nose points toward the floor (Figure 3).

Fig 3.

The fourth and the final step is to lift the patient into the sitting position with the face rotated and hyper extended to the unaffected ear side (Figure 4).

Fig 4.

The head is held in each position for 3 minutes.

Post maneuver instructions advised (Post-Epley's Maneuver Instruction sheet). No medications prescribed and the patients were scheduled for follow-up in a week.

Patients were followed-up a week after the maneuver, with an option of follow-up appointment within one year if symptoms recur.

RESULTS

Twenty-four patients were included in the study, males were 15 (62.5%), females 9 (37.5%) (Figure 5). Their age ranged between 20 and 60 years (42.7 years) (figure 6). All the patients were found to have a normal ENT and CNS examination, except for a positive Dix-Hallpike test confirming the clinical suspicion of BPPV.

Figure 5 & 6

In thirteen patients (54.1%), nausea and vomiting were found to be a common associated symptoms, while five patients (20.8%) were found to have some other associated aural complaints (figure 7).

Figure 7

While all the patients had head positional changes as a trigger for the vertigo episode, some postural element was found in fifteen patients (62%).

None of the patients had history of preceding viral URTI, or any associated visual, cervical or neurological complaints (figure 8).

Figure 8

Thirteen patients (58%) were found not to have associated chronic medical illness, five patients (21%) were diabetics, six (25%) were hypertensives, one (4%) was suffering from hyperlipidemia, and one patient (4%) was known to have ischemic heart disease. Positive history of head injuries was revealed in one patient (4%) (Figure 9).

Figure 9

The patients scored the negative impact of vertigo on the quality of their life and their daily activity. Pre-Epley's, 11 patients (48%) gave a score of 10 (very badly affected), while post-Epley's maneuver 21 patients (88%) scored 0 (No effect at all on their life) (figure 10). Twenty-two patients (91.7%) admitted a significant improvement post-therapy (figure 11).

Figure 10 & 11

The follow up period ranged from 2001 to 2004.

All the patients claimed a strict compliance with post-Epley's maneuver's instructions after the procedure.

When interviewed at the time of conducting the study, the vast majority of the patients claimed a dramatic improvement reflected in complete cessation of vertigo 22 patients (91.7%), the remainder 2 patients (8.3%) showed either minimal or no improvement at all.

DISCUSSION

Despite the limited number of patients in this study, it was able to clearly demonstrate the effectiveness of Epley's maneuver in the treatment of BPPV, with success rate approaching 92%. Other single-session of Epley's maneuver publications, their success is usually ranging from 78 - 90%¹⁵.

An overlooked important aspect of the BPPV is its impact on the quality of life, daily activity, and the dramatic improvement achieved post-therapy, was addressed and stressed this study.

Sex distribution in this study concurs with the literature review, which suggests that BPPV is more common in males (64%), which is comparable to 62.5% in this study¹⁵.

The recurrence rate of BPPV after Epley's maneuver is about 30% within the following year, and in some instances a second session may be necessary¹⁶.

Some authors modified the original procedure aiming to achieve extra success in the outcome by shaking or tapping the temporal region of the affected ear during the procedure, or using vibrators placed over the mastoid bone¹⁶. Others, however, modified the procedure by increasing the degree of head rotation, or the duration of each head position¹⁶. Furthermore, some studies claimed better outcome by repeating the procedure within a week¹⁷. In this study, we followed the original non-modified Epley's Maneuver, and still our outcome was within if not better than many of the modified techniques.

Daniel et al. reported a study on the management of Bilateral Benign Positional Paroxysmal Vertigo (BiBPPV) in which they described a typical characteristics of BiBPPV and confirmed that they can be managed successfully with Epley's maneuver performed on the most symptomatic side, followed by repeated treatment as needed¹⁸.

Epley classified the result after treatment with the maneuver into: I. Resolution of vertigo, II. Presence of nonpositional vertigo, III. Partial resolution and IV. Same or worse¹. On the other hand, Herdman et al classified the result into: 1. No symptoms, negative Dix-Hallpike maneuver, 2. Improvement with abnormal maneuver, 3. No change¹⁰.

Despite our short follow-up, which was limited for one year, none of the patients who showed an initial improvement experienced a recurrence, a longer follow-up and a bigger sample size is needed to confirm this finding.

CONCLUSION

In this study we found that Epley's Maneuver is an effective and very efficient modality of treatment for BPPV patient, and strongly recommend it as the first line of treatment.

Further studies with larger sample size and longer follow-up are needed to support the current study.

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Table 1 Post-Epley's Maneuver Instructions

(A) During the first week post-therapy:

1. Sleep with upper half of the body semi-upright position for at least the first 48 hours, with preference for the whole first week.
2. Avoid strictly sleeping on the effected ear (as labeled by your doctor).
3. Stay with head vertical daytime.
4. Avoid head shaking.
5. Avoid any exercises with head movements (shaving, attending hair dresser, and going to the dentist).

(B) After the first week post-therapy:

Can go back into your normal daily activity and your sleeping pattern of your preference, including that head-position which used to trigger the vertigo.