EFFICACY OF EPLEY’S MANOEUVRE IN POSTERIOR CANAL BENIGN PAROXYSMAL POSITIONAL VERTIGO
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ABSTRACT

BACKGROUND
Benign Paroxysmal Positional Vertigo (BPPV) is one of the most common disorders of vestibular system. Quality of life is significantly affected in vertigo. Purpose of this project was to study the causes of posterior canal BPPV in our patients and to assess the effectiveness of Epley’s manoeuvre in its treatment.

MATERIALS AND METHODS
Fifty patients who showed features of posterior canal BPPV on Dix-Hallpike test were included in the study. Epley’s manoeuvre was done in all patients and they were re-examined after one week and one month.

RESULTS
Our study showed a female preponderance for BPPV with a mean age of 48.32 years. In 94% patients, BPPV was idiopathic. Single Epley’s manoeuvre corrected BPPV in 80% patients.

CONCLUSION
Epley’s manoeuvre is a safe and effective treatment for BPPV.

KEYWORDS
Benign Paroxysmal Positional Vertigo, Dix-Hallpike Test, Epley’s Maneouvre.

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BACKGROUND
Benign Paroxysmal Positional Vertigo (BPPV) is a common vestibular disorder characterised by brief attacks of vertigo and nystagmus precipitated by certain changes in head position with respect to gravity.1 It maybe unilateral or involve both labyrinths.2 It creates a negative impact on people and affects their quality of life.3 The cause of BPPV is mostly idiopathic. It may also develop secondary to various disorders that damage the inner ear, head trauma, infection and aging. Idiopathic BPPV is more prevalent in adults and in women.4 Two theories have been put forward in the pathogenesis of BPPV- cupulolithiasis and canalithiasis. In cupulolithiasis degenerated otoconial fragments in the utricle adhere to cupula of posterior semicircular canal and make it denser than surrounding endolymph and thus more susceptible to effects of gravity. Canalithiasis theory says that the degenerated fragments remain floating in the endolymph of posterior canal and stimulate the cupula of posterior semicircular canal.4 Dix-Hallpike test is used to diagnose BPPV patients.2 Approaches to treat BPPV include vestibular habituation exercises, labyrinth sedation drugs, surgical ablation of posterior semicircular canal and repositioning manoeuvres. The most commonly used method for treating BPPV is Epley’s manoeuvre, which results in rapid improvement.5

We conducted this study to delineate the aetiology of posterior semicircular canal benign paroxysmal positional vertigo in our patients and to assess the efficacy of Epley’s manoeuvre in its treatment.

MATERIALS AND METHODS
Ours is a descriptive study conducted in Department of ENT after obtaining permission from the academic and ethical committee of the institution. Patients who came to our OP with complaints of dizziness were evaluated with detailed history about onset, duration and positions provoking vertigo, particularly while bending down, while looking up, rolling over, lying down in the bed or getting up from lying position. Associated symptoms like nausea, vomiting, tinnitus and deafness were also enquired. History of head trauma, other ear diseases and any systemic illness were noted. A complete neuro-otological examination, fistula test and pure tone audiogram was done for them. X-ray cervical spine was taken in patients with neck pain to exclude cervical spondylosis.
Dix-Hallpike (D-H) test was done in all cases and 50 patients who showed features of posterior canal BPPV were included in our study. In Dix-Hallpike test, patient sits on a couch and examiner holds the patient's head and turns 45° to right and suddenly brings the patient to a supine position so that his head hangs 30° below the horizontal. Patient's eyes are observed for nystagmus. After one minute, patient is brought back to the sitting position. Test is repeated with the head turned to left.

Roll test was carried out to detect horizontal BPPV. Here, patient lies supine with head flexed at 20°. Head is quickly rotated to one side and kept in that position for one minute. Head is then quickly rolled to the other side. Eyes are kept open to observe nystagmus. To detect superior canal BPPV, all patients were subjected to straight head hanging test.

Elderly patients, patients with recent history of myocardial infarction, patients with severe neck pain and cervical spondylosis, those with history of retinal detachment etc. were excluded from the study.

Selection of Cases - Posterior canal BPPV was diagnosed based on following characteristics of D-H test.

- a. Latency of nystagmus - one or more seconds after head position towards affected side.
- b. Presence of up beating torsional nystagmus or mixed vertical - torsional nystagmus.
- c. Vertigo and nystagmus lasting less than 60 seconds.
- d. Fatigability of nystagmus on repeated D-H testing.

Epley's manoeuvre was done in all selected 50 patients. Procedure was explained to the patient. The affected posterior canal was predetermined by D-H test. Patients were asked to keep the eyes open to watch the nystagmus. Tuning fork of 256 Hz was used to vibrate the mastoid prior to the test to loosen the debris. Oscillation of the head/mastoid to prevent adherence of debris to the walls of semicircular canals was also added to the procedure. Patient was seated on the examination table in such a way that on decubitus head would be beyond the end of the table and extended. Examiner supported the head of the patient. Sequences of the procedure were:

- a. Head turned 45° towards the affected side and quickly brought down to lying position- head hanging and neck extended (Figure 1a and b).
- b. Head rotated 90° towards the unaffected side- head hanging and neck in extended position (Figure 1c).
- c. Head and body rotated by further 90° from the previous position- now the nose facing down and neck in neutral position (neither extended nor flexed) (Figure 1d).
- d. Patient brought up to the sitting position while head kept turned towards the unaffected side.
- e. Lastly, head turned forwards and kept chin down 20° for one minute (Figure 1e).

During rotation, each position was maintained for one minute or till nystagmus settled down.

After the procedure, patients were instructed not to move the head violently, to be in semi-recline position while sleeping for 48 hours and to use soft cervical collar if possible. They were also advised not to lie on affected side and to take rest for one week.

Patients were examined after one week for any symptoms of vertigo and Dix-Hallpike test was repeated in all to objectively document resolution of BPPV, since patients with BPPV may avoid a provocative position and report resolution yet may have a typical attack and nystagmus on positioning. If symptoms or nystagmus persisted, Epley’s manoeuvre was repeated and reassessed after one month.

Response to Epley’s manoeuvre was tabulated as:

- Type I - Asymptomatic. No symptoms of dizziness. No nystagmus on D-H test.
- Type II - Improved. Patient subjectively better. Nystagmus still present.
- Type III - No change. No change in symptom or less than 70% improvement only. Nystagmus present on D-H test.

All data were entered in MS excel spreadsheet and analysed.

RESULTS
Fifty patients with posterior BPPV who attended our Otorhinolaryngology Department were included in the study. Females (n=38, 76%) outnumbered males (n=12, 24%). Male:female ratio being 3.2:1. Youngest patient was a 16-year-old female, the eldest being a male aged 65 years. Most of the patients (58%) belonged to 41-60 year age group. Mean age was 48.32 (SD-11.823) years. Table 1 shows the age distribution pattern in BPPV patients.

BPPV was idiopathic in 47 (94%) patients. In two patients, it followed head trauma while one developed the same after thyroidectomy. Aetiology of BPPV is shown in Table 2.

Disease process was unilateral in 47 patients. Right ear being involved more than left. Bilateral involvement was reported in 6% cases as shown in Table 3.

Among the fifty BPPV patients, 40 (80%) were cured by single Epley’s manoeuvre while 7 patients (14%) needed two sittings. Three patients required three sessions of Epley’s manoeuvre for cure. Table 4 explains the number of sessions of Epley’s manoeuvre that was needed in our patients.

After one week, 40 patients were totally asymptomatic with negative D-H test (type I response). Seven patients were symptomatically better, but D-H test showed nystagmus (type II response). Three patients had no change in vertigo or nystagmus (type III response). Table 5 lists the details of response of Epley’s manoeuvre at one week follow up.
BPPV was more common in females in our area, which is in accordance with previous reports.\cite{2,5,6}

As reported in literature,\cite{4,6} BPPV was mainly idiopathic in our study also (94%).

We observed BPPV on right side in 68% patients while it was bilateral in 6% patients. Verma A in his study of 100 patients observed BPPV on right side in 52, left side in 46 and bilateral in 2 patients.\cite{6} In a study from Brazil,\cite{5} the incidence of unilateral and bilateral BPPV were almost same while an Indian study observed it to be more common on left side (66%).\cite{2}

Transition from positive to negative D-H test after one or two Epley’s manoeuvre was considered as success in treatment.

The response rate after the first sitting of Epley’s manoeuvre was 80% in our project, which increased to 94% after the second sitting. 6% patients needed three sittings of Epley’s manoeuvre for cure. Babac et al\cite{7} reported 90.7% and 96% response after the first and second Epley’s manoeuvre, respectively. Gaur et al\cite{8} observed 92% benefit at one week follow up.

80% of our patients showed type I response at one week follow up after Epley’s manoeuvre. Verma A observed a higher rate (92%) of type I response after one week of Epley’s manoeuvre.\cite{6} Khatri et al observed a type I response in 88.2% patients at one month follow up.\cite{8}

**REFERENCES**


**DISCUSSION**

BPPV is a common vestibular disorder caused by dislodged otoconia. 50 patients with posterior BPPV were included in the present study. Most of our patients developed BPPV in the 4th and 5th decade of life. The mean age being 48.32. Pereira et al\cite{3} and Kumar et al\cite{2} observed a mean age of 53.2 and 54.3 respectively in their studies.
