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Role of Epley's manoeuvre for a Benign paroxysmal positional vertigo: a Longitudinal study.

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Abstract:

Introduction: Benign paroxysmal positional vertigo (BPPV) is the most prevalent peripheral vestibular disorder seen in neurotology clinics, about 20–30% of all vestibular complaints are caused by BPPV. Incidence of BPPV constitutes, 26% of all vertigo patients. Idiopathic in 83% of patients; secondary causes include vestibular migraine, Meniere's disease, labyrinthitis, and orthostatic hypotension.

Materials and methods: A longitudinal observational study was conducted among patients attending out-patient department of ENT, for a period of two years october 2020 to April 2022. All the patients in the age group of 20 to 80 years with features of benign paroxysmal positional vertigo, involving posterior semicircular canal were study population. Dix-Hallpike manoeuvre once done and the patient is tested positive for posterior canal BPPV, the therapeutic symptomatic management with anti- vertigo drugs were given along with the repositioning manoeuvres – for posterior canal BPPV viz.Epley's repositioning Manoeuvre.

Results: A prospective study conducted in a quaternary care centre in Bangalore, 70 participants were considered for the study. The mean age of presentation was 53.1 years. Out of the 70 subjects in the study 35 were males. Recurrence of BPPV was observed among 15 (21.4%) of participants.

Conclusion: Benign Paroxysmal Positional Vertigo is considered as one of the most common peripheral vestibular conditions which presents in the ENT OPD. BPPV was common in 5—0-60 years age group ,no gender preference was observed and recurrence was observed among 21.4% of participants after manoeuvre.

Key words: Benign paroxysmal positional vertigo (BPPV), Dix-Hallpike manoeuvre, Recurrence, Epley's repositioning Manoeuvre

Introduction:

Benign paroxysmal positional vertigo (BPPV) is the most prevalent peripheral vestibular disorder seen in neurotology clinics, about 20–30% of all vestibular complaints are caused by BPPV. [1, 2] Dislodged otoliths that exit the utricle and freely float in the semicircular canals or attach to the cupula provide the basis for the BPPV mechanism, which makes the labyrinth sensitive to gravitational forces. Recurrent, transient vertigo with concomitant nystagmus when extending or rotating the neck, rising or falling, or turning over in bed are the hallmarks of BPPV. Though it can also be secondary (occurring after head trauma, viral infection, Meniere's disease, migraine, otologic and non-otologic surgery, extended bed rest), BPPV is primarily idiopathic.[3]

Incidence of BPPV constitutes, 26% of all vertigo patients. Idiopathic in 83% of patients; secondary causes include vestibular migraine, Meniere’s disease, labyrinthitis, and orthostatic hypotension. Secondary BPPVs were usually recurrent, refractory to PRMs and took longer time to be treated. Both male and female are equally affected and commonest in 40–60 years age group. Posterior canal BPPV comprises 74% of all BPPV patients, followed by lateral and superior canal is least affected. [4]

BPPV is diagnosed by provocative tests like Dix-Hallpike for posterior canal, supine roll over for lateral canal, and deep head hanging for anterior canal.The majority of patients is treated successfully by particle repositioning maneuvers (PRM). Commonly performed PRMs are

Epley's maneuver for posterior canal BPPV, barbecue maneuver for lateral canal BPPV, and Yacovino maneuver for anterior canal BPPV.[4]

The purpose of this study is to assess the recurrence rate and the time interval after successful particle repositioning maneuvers.

Materials and methods:

A longitudinal observational study was conducted among patients attending out-patient department of ENT, Manipal Hospitals, HAL Old airport road, Bengalore, a quarternary care centre in Bangalore., for a period of two years october 2020 to April 2022. All the patients in the age group of 20 to 80 years with features of benign paroxysmal positional vertigo, involving posterior semicircular canal were study population.

Inclusion Criteria:

- Patients in the age group of 20 to 80 years
- Clinically diagnosed benign paroxysmal positional vertigo pertaining to the posterior semicircular canal
- Patients who were positive in Dix Hallpike manoeuvre which indicates posterior canal BPPV
- Patients who were willing to give written informed consent to take part in the study

Exclusion criteria:

- Patients who were taking treatment for malignancies, blood dyscrasias, trauma, bedridden patients, autoimmune disorders
- Patients lost to follow up.
- Patients not willing to give written informed consent.

Sample size was estimated considering the proportion of patients with features of benign paroxysmal positional vertigo with at least one comorbidity as 19.8%≈20.0% (p), based on the previous literature [5], a sample size of 62 was estimated on applying the formula, n=z2(pq/d2), where, z=1.96 at 95% confidence interval and q=100-20=80.0%, and „d" absolute precision being 10.0%. On considering 10.0% of the sample size as lost to follow up, a sample size of 68 is considered for the study.

After obtaining institutional ethics committee approval, Patients fulfilling inclusion criteria were considered for the study. Dix-Hallpike manoeuvre once done and the patient is tested positive for posterior canal BPPV, the therapeutic symptomatic management with anti-vertigo drugs were given along with the repositioning manoeuvres – for posterior canal BPPV viz.Epley's repositioning Manoeuvre.

A semi-structured questionnaire consisting of details on socio-demographic profile, clinical history, findings of ENT and vestibular examination, general examination and Central nervous system examination, investigations, treatment/ management and follow-up were used to collect the data.

The primary outcome is the reduction in the symptoms of BPPV or complete resolution of BPPV. The outcomes were measured immediately after treatment, at the end of 1st, 3rd and 6th month following the manoeuvre performed.

Statistical analysis:

All the data was entered into Microsoft Excel and the continuous data viz., age in years, systolic and diastolic blood pressure were expressed in mean and standard deviation and discrete data viz., gender, side of lesion, symptoms, comorbidities, percentage reduction in the symptoms and/ or resolution of BPPV were expressed in proportions or percentages. The association of number of comorbidities, presence of comorbidities with outcomes were analysed using Chi-square test or Fisher’s exact test and the difference in means with respect to outcomes for continuous data were analysed using independent t test. The analysis was conducted using a statistical package for the social sciences (SPSS) (version 20.0). A P-value of <0.05 will be considered as statistically significant.

Results:

A prospective study conducted in a quaternary care centre in Bangalore, 70 participants were considered for the study. The mean age of presentation was 53.1 years, There were subjects from 24 to 76 years of age. Most of the subjects were in age group 51-60years of age group. Out of the 70 subjects in the study 35 were males and 35 were females, hence there was no gender prevalence in our study. Most of the cases 54.3% cases right side was affected and 8.6% had bilateral involvement.(Table 1)

All participants enrolled for the study were done with Epley's repositioning Manoeuvre. Recurrence of BPPV was observed among 15 (21.4%) of participants. (Figure 1) Out of the 15 subjects who had recurrence 6 were females and 9 were males, recurrence was more in males. Out of the 28 subjects who received epley's correction on the left side -5 subject presented with a recurrence and out of the 42 subjects who received epley's correction on the right side -10 subjects presented with recurrence. (Table 2). Out of the 15 subjects who presented with recurrence, 9 subjects had only one episode of recurrence, 5 subjects had 2 episodes and 1 of them had 4 episodes.

Discussion:

BPPV is one of the common causes of vertigo that manifests in an ENT clinic. The aim of this study was to analyse the relationship between various socio demographic features and recurrence after Manoeuvre and to find the risk factors for recurrence of the disease. In our study, we evaluated all patients diagnosed with BPPV by clinical history and by performing Dix Hall pike manoeuvre. Patients were also evaluated for co- existing comorbidities. Recurrence rate of BPPV ranges from 20% to 50%, as reported by several studies.[6,7]

In present study, we studied 70 subjects who were clinically diagnosed with BPPV out of which the majority (54 subjects) of the patients had at least one comorbidity. These patients were followed up for a period of 3 months to 1year.

On following up, we found that 21.4% of patients had recurrence even after successful treatment with Epley’s canalith repositioning manoeuvre.

The maximum number of patients in our study were in the age group of 51-60 years with the mean age of presentation being 53.1 years. Oghalai JS et al carried out a study of BPPV in elderly patients and found similar results with the maximum age of presentation being 45-60 years.[8]

In our study, males and females were affected equally. A few studies however had shown an increased incidence in females[9] which is hypothesised to be because of the hormonal influence. The rate of recurrence of BPPV in the elderly is high as Vestibular system degenerates with age. Degeneration of otoconia can occur due to age related decalcification, which renders it unstable. Other age related comorbidities also causes increased risk in the

elderly. these factors can lead to easy detachment of otoconia. Cupulolithoiasis will be severe in aged individuals due to degenerated otoconia from utricular macula.[10]

Strength of the study was it's a longitudinal study done in a hospital based setup. Limitation of the study was limited sample size and lack of comparison group.

Conclusion:

Benign Paroxysmal Positional Vertigo is considered as one of the most common peripheral vestibular conditions which presents in the ENT OPD. In our study subjects from 21 years to 76 years are included. The mean age of presentation was 53.1 years. Study has shown 21.40% of patients have recurrence of symptoms after a successful repositioning manoeuvre. Recurrence was more common among males.

Table 1: Socio demographic features of participants

Socio demographic feature		Frequency	Percentage
Age	21-30 yrs	2	2.9%
	31-40 yrs	13	18.6%
	41-50 yrs	15	21.4%
	51-60 yrs	17	24.3%
	61-70 yrs	15	21.4%
	>70 yrs	8	11.4%
Gender	Male	35	50%
	Female	35	50%
Side of involvement	Left	26	37.1%
	Right	38	54.3%
	Bilateral	6	8.6%

Figure 1: Recurrence of BPPV after maneuverer

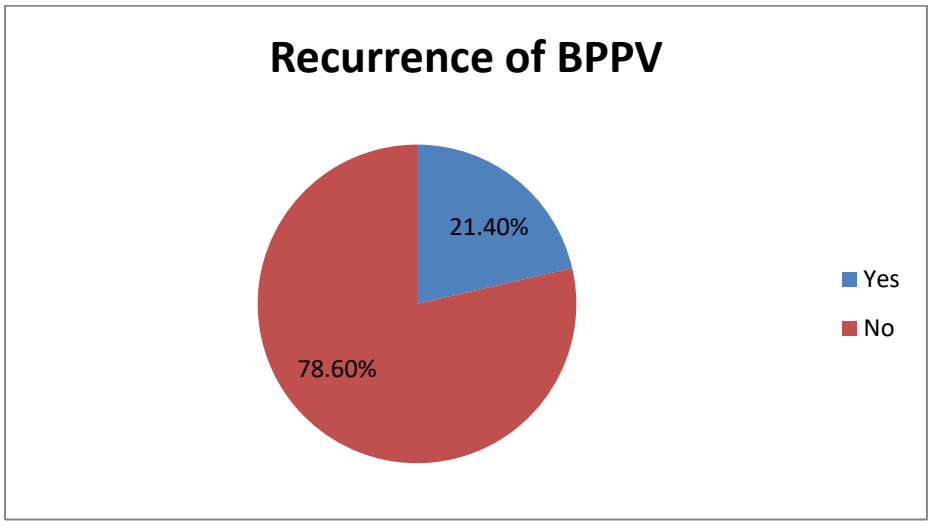

Figure 2: Frequency of recurrence of BPPV in subjects who received Epley's correction

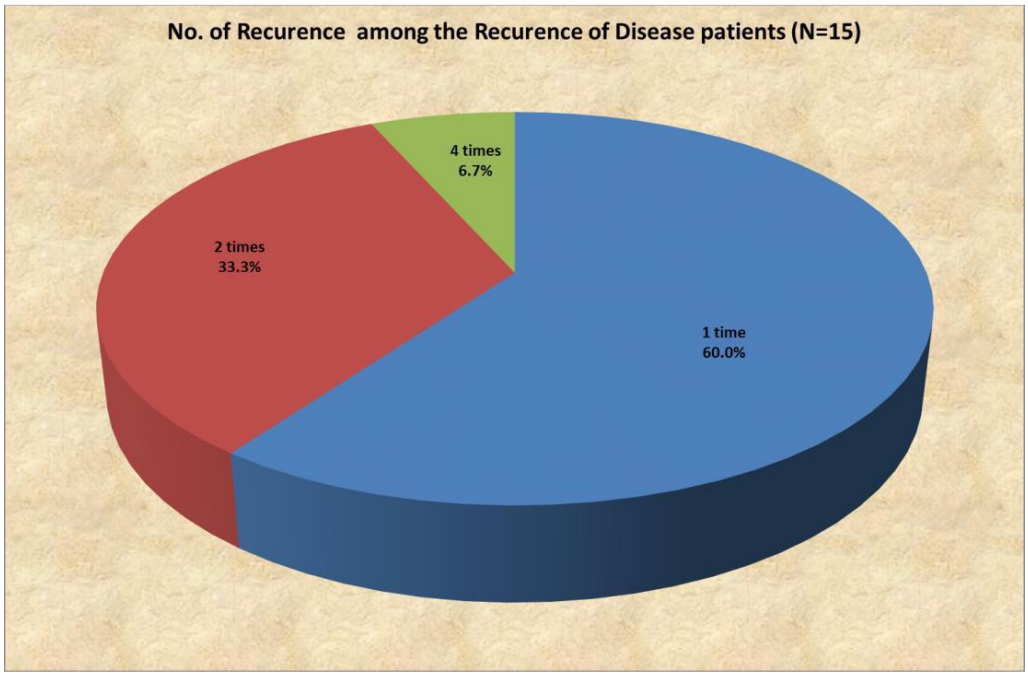

Table 2: Demographic features of participants with recurrence of BPPV

Socio demographic feature		Frequency	Percentage
Age	21-30 yrs	2	2.9%
	31-40 yrs	13	18.6%
	41-50 yrs	15	21.4%

	51-60 yrs	17	24.3%
	61-70 yrs	15	21.4%
	>70 yrs	8	11.4%
Gender	Male	09	60%
	Female	06	40%
Side of involvement	Left	04	26.7%
	Right	07	46.7%
	Bilateral	04	26.7%

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