

EFFECTIVENESS OF REHABILITATION VESTIBULAR EXERCISE IN THE MANAGEMENT OF POSTERIOR CANAL BENIGN PAROXYSMAL VERTIGO

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ABSTRACT

BPPV is a very common disorder that causes paroxysms of positional vertigo. Even though BPPV is a benign disease that is treatable using relatively Simple bedside maneuvers, most of the expenses being attributable to inappropriate diagnostic procedures and ineffective therapies. Correct diagnosis and proper treatments based on current concepts of BPPV will reduce these unnecessary diagnostic procedures and costs. **AIMS:** 1. To evaluate the role of vestibular rehabilitation exercises in the management of benign paroxysmal positional vertigo (BPPV). 2. To compare the Effectiveness of the three vestibular exercises- Epley's manoeuvre, Semont's manoeuvre and Brandt-Daroff exercises- in treatment of BPPV. **METHODS AND MATERIALS:** This was a prospective study and conducted on 42 patients diagnosed as posterior canal BPPV, attending OP at Division of Otorhinolaryngology, Raja Muthiah Medical College during the study period from October 2014 to September 2015. **RESULTS:** 29 out of 42 patients (68.1%) reported relief of symptoms at end of 3 months without recurrence. Result was best for the group which was subjected to the EPLEY'S manoeuvre (85.8%). **CONCLUSION:** Epley manoeuvre is a safe, effective treatment for **POSTERIOR CANAL BPPV**, based on the results of 42 patients small randomized study with relatively short follow up. Performing any of the three manoeuvres can be expected to give good results in the management of BPPV.

Keywords: Bppv, Epley's Manoeuvres, Semont's Manoeuvres, Brandt-Daroff Manoeuvres.

1. INTRODUCTION

Life time prevalence of BPPV¹⁵ is 2.4% and accounts for 8% of individuals with moderate to severe vertigo. The incidence is difficult to estimate given the benign, typically self-limited course of the disease. It is thought to vary from 10.7 per 100,000 to 17.3 per 100,000 population in Japan and 64 per 100,000 in a population study from Minnesota. BPPV, as a diagnosis, is almost twice as frequent as is Ménière's disease at the Sunnybrook Health Science Centre

Dizziness Unit. In India 3% of the population are affected by vertigo of which 22% are BPPV

METHOD OF DATA COLLECTION

This study proposes to include 42 patients aged 18 or older of either sex who will be attending OPD in Div. of Otorhinolaryngology at RMMCH, Chidambaram and diagnosed with posterior canal BPPV through history and clinical examination.

The history, added with the typical eye-findings (vertical – torsional nystagmus upwards and towards the affected ear)

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during the Dix-Hallpike manoeuvre with Rombergs tandem walking were negative, is sufficient for the diagnosis of BPPV.

Patients will be randomly assigned into three groups
 Group A: 14 patients will undergo Epley’s manoeuvre
 Group B: 14 patients will undergo Semont’s manoeuvre
 Group C: 14 patients will undergo Brandt-Daroff exercises
 Follow-up visits were arranged at 2 weeks, 1 month and 3 months.

End-point was selected as relief of symptoms at 2 weeks with no recurrence of symptoms at 3 months.

INCLUSION CRITERIA

Patients presenting with
 1.Sudden, severe attacks of horizontal and/or vertical nystagmus associated with vertigo precipitated by certain head positions or movements.
 2.Positive Dix Hallpike test.

EXCLUSION CRITERIA

External or Middle ear diseases, cervical stenosis, severe kyphoscoliosis, limited cervical range of motion, Down’s syndrome, severe rheumatoid arthritis, cervical radiculopathies, Paget’s disease, Ankylosing spondylitis, Low back dysfunction, Spinal cord injuries, and Morbid Obesity.

DURATION OF STUDY

OCTOBER 2014 TO SEPTEMBER 2015- 12 MONTHS.

2.METHOD

Institutional ethical committee approval was obtained and the procedure was explained in detail to patients with its associated adverse effects. The following procedure will be carried out after ruling out ophthalmic causes for nystagmus
 Patients were assigned into group A,B and C based on the day of reporting to OPD like patients reporting on Monday and Thursday were assigned Group A, Tuesday and Friday into Group B and Wednesday and Saturday into Group C
 Group A patients underwent Epley’s manoeuvre
 Group B patients underwent Semont’s manoeuvre
 Group C patients underwent Brandt-Daroff exercises

Post treatment instructions and follow up

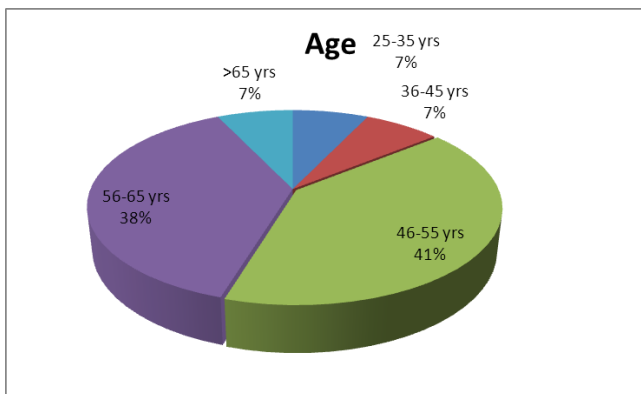
Patients were instructed not to lie supine, to keep their head at 45° reclining position while sleeping for 2 days. All patients were told not to bend over, look up or down or to lie on the affected side for 7 days following the procedure and to follow up at the end of 2 weeks, 1 month and 3 month

3.RESULTS AND DISCUSSION

AGE DISTRIBUTION

The mean age of the patient was 54 with a range of 25 to 70 years.
 Age group between 46 to 55 are more affected by BPPV.

Age	Frequency	Percentage
25-35 yrs	3	7.1
36-45 yrs	3	7.1
46-55 yrs	17	40.5
56-65 yrs	16	38.1
>65 yrs	3	7.1
Total	42	100.0

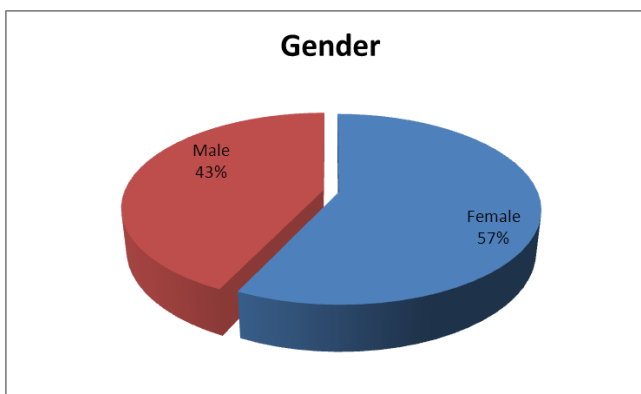


Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Age	42	25.00	75.00	54.0000	10.96335

SEX DISTRIBUTION

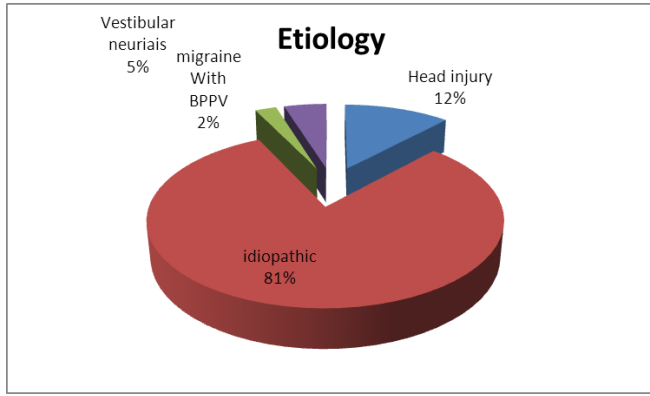
There were 18 males (43%) and 24 females(53%) in the study group.
 More females affected in my group



	Frequency	Percentage
Female	24	57.1
Male	18	42.9
Total	42	100.0

ETIOLOGY

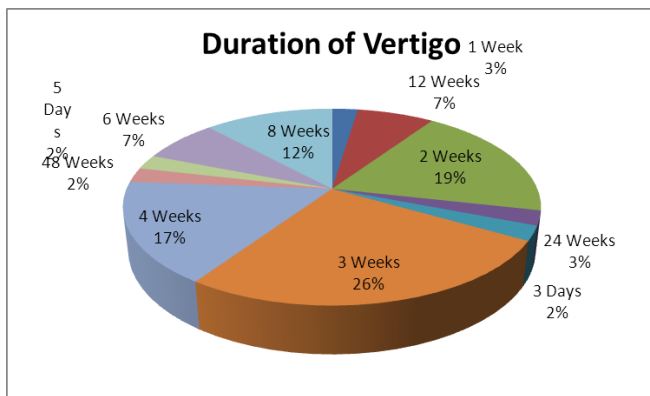
In my study most of the patients (34pts i.e-84%) had unknown etiology(no associated symptoms or findings), followed by head injury (5 pts), vestibular neuritis(2 pts) and migraine (1pt)



	Frequency	Percentage
Head injury	5	11.9
idiopathic	34	81.0
migraine With BPPV	1	2.4
Vestibular neuritis	2	4.8
Total	42	100.0

DURATION OF VERTIGO

Most of the patients had symptoms for 3 weeks duration

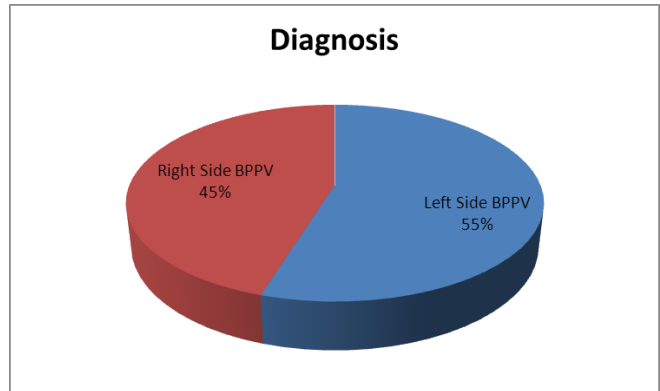


	Frequency	Percentage
1 Week	1	2.4
12 Weeks	3	7.1
2 Weeks	8	19.0
24 Weeks	1	2.4
3 Days	1	2.4
3 Weeks	11	26.2
4 Weeks	7	16.7
48 Weeks	1	2.4
5 Days	1	2.4
6 Weeks	3	7.1
8 Weeks	5	11.9
Total	42	100.0

SIDE AFFECTED

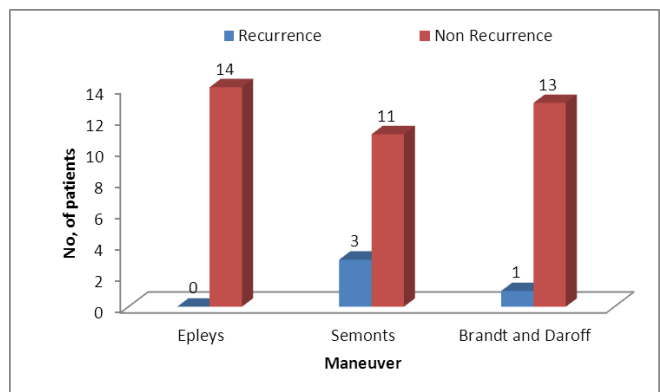
In my study 23 patients had left ear pathology and 19 on right ear

Diagnosis	Frequency	Percentage
Left Side BPPV	23	54.8
Right Side BPPV	19	45.2
Total	42	100.0



RELIEF OF SYMPTOMS AT END OF TWO WEEKS

At end of 2 weeks only four patients had recurrence, 3 from group B and one from group C. No recurrence in group A.



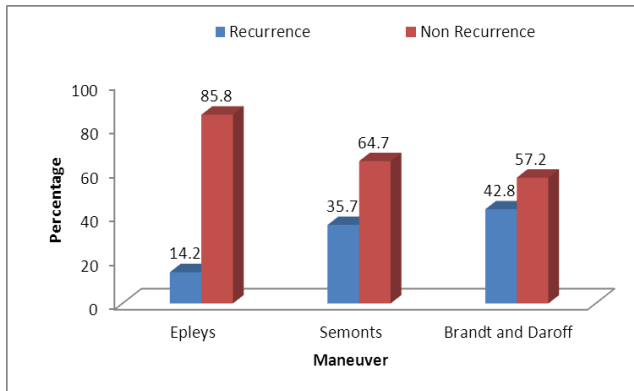
	Maneuver			Total
14 Days	Epleys	Semonts	Brandt and Daroff	
Recurrence	0	3	1	4
Non Recurrence	14	11	13	38 (90.47%)
Total	14	14	14	42

END OF 3 MONTHS

At end of 3 months study period out of 42 patients 13 had recurrence and 29 are relieved of symptoms. Of Group A only two patients had recurrence, giving 85.8% success rate. In Group B five patients had recurrence giving success rate of 64.7% and in Group C patients six patients had recurrence giving success rate of 57.2%. Overall

value 0.235.

Of the all three rehabilitation manoeuver Epley's has a high success rate



90 Days	Maneuver			Total and
	Epleys	Semonts	Brandt Daroff	
Recurrence	2 (14.2)	5 (35.3)	6 (42.8)	13 (30.9)
Non Recurrence	12(85.8)	9(64.7)	8 (57.2)	29(68.1)
Total	14(100)	14 (100)	14 (100)	42(100)

p value 0.235

In a study by Ajit Verma¹⁸ on Particle dislodgement procedure which is a prospective study of 100 consecutive cases of posterior canal Benign Paroxysmal Positional Vertigo at Department of Neurology, Akshay Hospital, Bhopal has following comparisons.

	AJITH VERMA	PRESENT STUDY
MALE:FEMALE	41:59	18:24(42%:57%)
AGE GROUP	< 20 yrs 21 - 40 yrs 41 - 60 yrs > 60 yrs	Nil 23 56 21
DURATION	< 1 month 1-3 months 3-6 months 6-months - 1 yr >1 yrs	71 5 2 20
ETIOLOGY	Idiopathic Post-traumatic	89 11
		<25 yrs nil 25-45 yrs 6 45-65 yrs 33 >65 yrs 3
		< 1 month 29 1-3 months 11 3-6 months 1 6-months - 1 yr 0 >1 yrs 1
		Idiopathic 34 Head injury 5 Vestibular neuritis 2 Migraine asso bppv 1

In my study efficacy for Epleys manoeuvre is 100% in 2 weeks of 1st follow up.

Epley¹⁰ repeated the CRP procedure till no nystagmus was observed during the last cycle, or until no progress was apparent in the last two cycles. The results of cure with single or multiple cycles vary from 52% to 94%. (Table).

Author	no.of pts	1 st follow up	Criteria cure	% cure
Epleys ¹² (1992)	30	1 week	DH	90%
Parnes and Price ¹² Jones (1993)	38	3-4 weeks	Symptoms & DH	68.5%
Hardman et al. ¹² (1993)	30	1-2 weeks	DH/ Quest	57% cured, 33% Improved 10% no change
Blakley B W (1994)	38	1 month	Verbal	94%
Smouha and Eric (1997)	27	2WEEKS	DH	52%
Lynn et al. (1995)	18	1 month	DH	88.9%
PRESENT STUDY	48	2 WEEKS	DH	90.47%

In the present study the procedure was repeated three times in all the patients irrespective of nystagmus being present or absent to ensure complete removal of the particles and was well tolerated by the patients. Various modifications of Epley's procedure are shown in Table. The rationale of post-treatment precautions is to ensure that the particles would not fall back into the posterior semi circular canal and induce recurrence of symptoms.

Patients were instructed not to lie supine, to keep their head at 45° reclining position while sleeping for 2 days. All patients were told not to bend over, look up or down or to lie on the affected side for 7 days following the procedure.

The Semont manoeuvre is more effective than no treatment or Brandt-Daroff exercises in relieving symptoms of posterior canal BPPV, according to studies with small sample sizes and limitations. No adverse events have been reported in trials with the liberatory manoeuvre.

In present study at one week follow up epleys had 100% success but brandt & daroff method was more effective than semonts method ,but at end 3 months follow up epleys had 85.8% ,semonts (64.7%) and Brandt daroff 57.2% success rate.

Subhadeep Karanjai¹⁵ in his study of 48 patients had success rate of 75% for Semont's manoeuvre, 87.5 % for epleys manoeuvre and 56.25% for brandt-daroff's manoeuvre.

The Semont's manoeuvre has also been shown to give good results. In a study¹⁵ involving 160 patients of BPPV, only eight needed another type of rehabilitation after one session of Semont's manoeuvre (Serafini et al, 1996). One study¹⁵ has compared the results of Semont's manoeuvre with posterior ampullary nerve section, and has shown clear advantage of the former over surgical therapy in the management of BPPV (Hausler et al, 1989). In present study Semont's manoeuvre have 64.7% cure rate.

The results of the Brandt-Daroff exercises are not so encouraging. Helminski in a study involving 116 subjects ⁷, 37% experienced recurrence of symptoms after performance of the exercises, compared to 47% in the control group. In present study group the success rate of Brandt-Daroff

exercises is 57.2%, which is less when compared other exercises

strengths and assumptions and challenges for the future. Br J Gen Pract1998; 48: 1173-1177

Efficacy of the particle repositioning manoeuvre for posterior canal BPPV (EPLEY)¹⁰

Reference	No of patients	success rate %	Recurrence rate %	Treatment sessions	No of maneuvers per session	Post maneuver instructions	Mastoid vibration
Epley	30	80	30	Single	Multiple	Yes	Yes
Li	27	92	NR	Single	Single	Yes	Yes
Blakley	16	94	NR	Single	Single	No	No
Smouha	27	93	NR	Multiple	Multiple	No	No
Wolf et al	102	93	5	Single	Single	Yes	No
Herdman et al	30	90	10	Single	Single	Yes	No
Parnces and Price-Jones	34	88	17	Multiple	Multiple	Yes	No
Weider et al	44	88	9	Multiple	Multiple	Yes	Yes
Steenerson and Cronin	20	85	NR	Multiple	Multiple	No	No
Welling and Barnes	25	84	NR	Multiple	Single	Yes	No
Harvey et al	25	68	20	Multiple	Single	Yes	No
Lynn et al	18	61	NR	Single	Single	Yes	No
Present study	14	85.8	14.2	Single	Multiple	Yes	No

4.CONCLUSION

BPPV is a very common disorder that causes paroxysms of positional vertigo. Even though BPPV is a benign disease that is treatable using relatively Simple bedside maneuvers, most of the expenses being attributable to inappropriate diagnostic procedures and ineffective therapies. Correct diagnosis and proper treatments based on current concepts of BPPV will reduce these unnecessary diagnostic procedures and costs.

A prospective study was conducted involving 42 patients to evaluate the effectiveness of vestibular rehabilitation exercises in the management of Posterior canal BPPV and comparison between effectiveness of epley’s , semont’s, and brandt and daroff method of repositioning of otholith.

From the analysis of our study the following results were summarized.

- Majority of patients were 4th to 6th decades commonly affected by BPPV.
- Females were more affected.
- Most of the causes were idiopathic.
- Epley manoeuvre is a safe, effective treatment for **POSTERIOR CANAL BPPV**, based on the results of 42 patients small randomized study with relatively short follow up.

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