ARE NECK RESTRICTIONS REQUIRED AFTER EPLEY MANEUVER FOR MANAGING BENIGN PAROXYSMAL POSITIONAL VERTIGO

Muhamad Waqar Khan, Shahzad Nayyar, Sidra Malik, Saleem Asif Niazi

Combined Military Hospital Peshawar / National University of Medical Sciences (NUMS) Pakistan

ABSTRACT

Objective: To compare the effects of neck restrictions on efficacy of Epley maneuver in management of benign paroxysmal positional vertigo (BPPV).

Study Design: Randomized clinical trial.

Place and Duration of Study: Ear, nose, throat out-patient department (ENT OPD), Combined Military Hospital Peshawar, from Dec 2014 to Nov 2015.

Material and Methods: Total 198 patients were recruited who presented to ENT department with complaints of positional vertigo and having positional nystagmus upon performing Dix-Hallpike. Patients were randomly divided in two equal groups of ninety nine patients each. Studied group (group A) was advised post-maneuver neck restrictions while control group (group B) was allowed normal neck movements. Outcomes were measured in terms of decreased intensity of vertigo on follow-up after 7 days.

Results: Although patients in group-A (with post-maneuvre restrictions) had a better outcome than patients in group-B (without restrictions), (83.8% vs. 73.7%), but this difference was not statistically significant (*p*=.082).

Conclusion: No significant effect was seen in the outcome of Epley maneuver with and without neck restrictions in the management of BPPV.

Keywords: Benign paroxysmal positional vertigo, Dix-Hallpike maneuvre, Epley maneuver, Post-maneuver neck restrictions.

INTRODUCTION

Benign paroxysmal positional vertigo (BPPV) is a disorder of peripheral vestibular system and is commonly encountered in otolaryngology clinics[1]. BPPV is characterized by a short-termed positional vertigo which is accompanied by nystagmus[2]. The nystagmus and vertigo are produced by movements of head relative to gravity and are especially marked while turning over in bed[3]. Women are predominantly affected more than men[4-6].

Benign paroxysmal positional vertigo is caused by otoconial debris which gets dislodged from the utricle and by way of gravity, precipitates to the semicircular canals[7]. Benign paroxysmal positional vertigo can be primary or idiopathic and secondary. Secondary causes include trauma to the head, Meniere's disease, vestibular neuritis, postsurgical, migraine and sudden sensorineural hearing loss[8].

A number of treatment modalities lay at physicians' choice in the management of BPPV, each having its own benefits[9,10]. Several maneuvers are in use for treatment of BPPV, which aim at replacing the displaced otoconia to the utricle[1]. Postural restrictions were advised by Epley after canalith repositioning maneuvers. The concept of postural restrictions was that any free floating debris might gravitate back into the posterior semicircular canal[11]. These restrictions include sudden head movements, and prevention of any cervical extension[12]. However, over the years studies have been carried out regarding the efficacy of these restrictions. Despite the fact that more patients with post-maneuver neck restrictions have reported symptomatic improvements, the difference is not significant and hence these restrictions are termed unnecessary by many a number of studies[1,12,13].

Correspondence: Dr Muhammad Waqar Khan, HOD ENT Head & Neck Surgery Flight Surgeon CMH Peshawar Pakistan
Email: mw61khan@gmail.com
Received: 29 Aug 2016; revised received: 13 Dec 2016; accepted: 13 Dec 2016

This study was conducted at Combined Military Hospital Peshawar to assess the impact of post-maneuver neck restrictions on efficacy of Epley maneuver. No such study had been conducted in our department regarding the said aspect. Hence, we conducted this study to provide local statistical data for guiding us in treatment of patients with BPPV by helping us determine whether or not restricted movements are justified in these patients.

PATIENTS AND METHODS

We conducted a randomized clinical trial at ear, nose, throat (ENT) department, Combined Military Hospital Peshawar from December 2014 till November 2015. Non probability consecutive sampling technique was used. Sample size was calculated by WHO sample size calculator 2.0 which was 198 i.e. 99 patients in each group, keeping anticipitated population proportion for efficacy of Epley maneuver with neck restrictions 90%[13] anticipitated population proportion for efficacy of Epley maneuver without neck restrictions 74.2%[13], power of test 90% and level of significance 5%. Group A was treated with Epley maneuver with post-maneuver neck restrictions. Group B was treated with Epley maneuver without post-maneuver neck restrictions.

Patients of both genders with age between 30 to 70 years with no hearing loss and diagnosed as having benign paroxysmal positional vertigo diagnosed by Dix-Hallpike test were included in this study. On the other hand, patients with history of recent head or neck injury, patients with cardiovascular disorders like ischemic heart disease, hypertension, carotid artery stenosis or postural hypotension, severe cervical spondylosis and patients with continuous spontaneous excluded from this study.

Dix-Hallpike Test

It helps to differentiate vertigo induced from a central or peripheral lesion. Any contra-indication to performing Dix-Hallpike test will be excluded by history. The method has been illustrated by an example given below:

Patient will sit on a couch.

- Patient's head will be turned 45^0 to the right side.
- Patient will be placed in a supine position so that his head hangs 300 below horizontal.
- Nystagmus or vertigo will be noticed in the patient.
- Procedure will be repeated for the left side.

Epley Maneuver

When vertigo and nystagmus appear on Dix-Hallpike test, e.g. for right side followings maneuvers will be done:

- The researcher will wait till vertigo and nystagmus subside
- Patient's head will be turned so that affected faces ear is upwards.
- The whole body and head will be rotated away from the affected ear to a lateral recumbent position in a face-down position.
- Finally, the patient would be made to sit in upright position with head still turned to the unaffected side by 45^0.
- The head will then be turned forward and chin brought down 20^0.

Each position will be maintained for 45-60 seconds.

Post-Maneuver Neck Restrictions

Once Epley maneuver has been performed, neck movements restrictions will be applied in randomly selected patients. These restrictions include limited head movement, lying propped up in bed with at least 3 pillows, not lying on the side of disease, and avoiding cervical extension or rotation of neck.

Recovery in terms of vertigo will be assessed by a visual analogue scale (0-3) which is defined as:-

- No vertigo: 0
- Mild vertigo (Patient has vertigo but can continue routine activities): 1

- Moderate vertigo (Vertigo disturbing daily routine activities): 2
- Severe vertigo (Disabling vertigo making the patient bed-ridden): 3

Improvement in visual analogue scale by one or more points, one week after performing the Epley maneuver, will be considered as recovery. The method which will result in recovery will be termed as effective. Patients will be reviewed on 7th day after performing Epley maneuver. Dix-Hallpike test will be repeated to see positional nystagmus.

Data Analysis

After seeking permission from hospital ethical committee, 198 patients were selected after detailed history, examination and Dix-Hallpike test diagnosis of benign paroxysmal positional vertigo on 1st visit based on VAS. Hospital registration number, name, age, gender, address and phone number (optional) were noted. Inclusion and exclusion criteria were followed to rule out bias. Patients were randomly divided into 2 groups of 99 each using random number table. Group A was treated with Epley maneuver with post-maneuver neck restrictions. Group B was treated with Epley maneuver without post-maneuver neck restrictions. The patients were examined on 7th day and Dix-Hallpike was repeated to look for any positional vertigo. Data were analyzed using software SPSS-17 and the level of significance was $p<0.05$.

Table-I: Gender and study groups crosstabulation.

Gender		Study Groups		Total	*p* value
		Group-A	Group-B		
Male	Count	39	37	76	0.770
	% within Study Groups	39.4%	37.4%	38.4%	
Female	Count	60	62	122	
	% within Study Groups	60.6%	62.6%	61.6%	

Table-II: Baseline severity of vertigo and study groups crosstabulation.

Baseline Severity of Vertigo		Study Groups		Total	*p* value
		Group-A	Group-B		
Mild Vertigo	Count	34	35	69	0.816
	% within Study Groups	34.3%	35.4%	34.8%	
Moderate Vertigo	Count	32	35	67	
	% within Study Groups	32.3%	35.4%	33.8%	
Severe Vertigo	Count	33	29	62	
	% within Study Groups	33.3%	29.3%	31.3%	

Table-III: 7th days post-treatment vertigo severity and study groups crosstabulation.

7th Days Post-Treatment Vertigo Severity		Study Groups		Total	*p* value
		Group-A	Group-B		
No Vertigo	Count	42	40	82	0.940
	% within Study Groups	42.4%	40.4%	41.4%	
Mild Vertigo	Count	30	30	60	
	% within Study Groups	30.3%	30.3%	30.3%	
Moderate Vertigo	Count	26	27	53	
	% within Study Groups	26.3%	27.3%	26.8%	
Severe Vertigo	Count	1	2	3	
	% within Study Groups	1.0%	2.0%	1.5%	

RESULTS

The age of the patients ranged from 30 years to 70 years with a mean of 48.09 ± 10.45 years.

There were 76 (38.4%) male and 122 (61.6%) female patients in the study group. Before the Epley maneuver, 34.8% patients had mild vertigo, followed by moderate and severe vertigo in 33.8% and 31.3% patients respectively.

These patients were randomly divided into 2 treatment groups each comprising of 99 patients. Group-A underwent Epley maneuver with post maneuver neck restriction and group-B underwent only Epley maneuver. There was no statistically significant difference between the two groups in terms of mean age (p=.630), gender (p=.770) and baseline severity of vertigo (p=.816) (table-I).

Seven days post treatment, most of the patients (41.4%) had no vertigo, followed by mild, moderate and severe vertigo in 30.3%, 26.8% and 1.5% cases respectively. There was no significant difference in the severity of vertigo between the two groups 7 days after treatment (p=.940) table-II,III).

Overall, 156 (78.8%) patients showed improvement. The efficacy / frequency of recovery was higher with Epley manoeuvre with post maneuver neck restrictions (83.8% vs. 73.7%) as compared to Epley maneuver alone however, the difference was not statistically significant (p=.082) table-IV.

DISCUSSION

This study included 198 patients of both genders aged between 30-70 years who presented with BPPV. These patients were randomly divided into 2 treatment groups each comprising of 99 patients. Group-A underwent Epley maneuver with post maneuver neck restriction and group-B underwent only Epley maneuver. The mean age of the patients was 48.09 ± 10.45 years. Papacharalampous et al. (2012) in a similar study observed mean age to be 58.9 ± 13.7 years[1]. There were 76 (38.4%) male and 122 (61.6%) female patients in the study group. Papacharalampous et al. (2012) and Fyrmpas et al., (2009) observed similar female predominance of 58.54% & 62.5% respectively in patients presenting with BPPV[1,13]. Before the Epley maneuver, 34.8% patients had mild vertigo, followed by moderate and sever vertigo in 33.8% and 31.3% patients respectively. There was no statistically significant difference between the two groups in terms of mean age (p=.630), gender (p=.770) and baseline severity of vertigo (p=.816). Thus there was no inherent heterogeneousity in the study groups.

Seven days post treatment, most of the patients (41.4%) had no vertigo, followed by mild, moderate and severe vertigo in 30.3%, 26.8% and 1.5% cases respectively. When compared there was no significant difference in the severity of vertigo between the two groups 7 days after treatment (p=.940). Overall, 156 (78.8%) patients showed improvement. The efficacy / frequency of recovery was higher with Epley's manoeuvre with post maneuver neck restrictions (83.8% vs. 73.7%; p=.082) as compared to Epley

Table-IV: Recovery, study groups and gender crosstabulation.

Gender	Recovery		Study Groups		Total	*p* value
			Group-A	Group-B		
Male	Yes	Count	32	26	58	.227
		% within Study Groups	82.1%	70.3%	76.3%	
	No	Count	7	11	18	
		% within Study Groups	17.9%	29.7%	23.7%	
	Total	Count	39	37	76	
		% within Study Groups	100.0%	100.0%	100.0%	
Female	Yes	Count	51	47	98	.202
		% within Study Groups	85.0%	75.8%	80.3%	
	No	Count	9	15	24	
		% within Study Groups	15.0%	24.2%	19.7%	

maneuver alone however, the difference was not statistically significant. Balicki et al. in 2014 had a *p* value of 1.000 when assessing the effects of post Epley maneuver neck restrictions. However, they themselves stated that there sample size was too small to check for variation in results[14]. Papacharalampous et al. conducted a study in 2012 with a similar hypothesis as our study. He also observed that although more patients had better outcomes with post-Epley maneuver neck restrictions, the difference was not statistically significant ($p>0.5$). Hence, they concluded that neck restrictions do not alter the outcome of Epley maneuver[1]. Fyrmpas et al in 2009 also conducted a similar study which showed 90% patients with neck restrictions after Epley maneuver had a egative follow-up Dix –Hallpike test compared to 74.2% result in patients without neck restrictions. However, this difference was not statistically significant[13]. In 2013 Jia et al. conducted a similar study and found that postural restrictions do not have any added beneficial effect in management of Benign paroxysmal positional vertigo[15].

CONCLUSION

No significant effect was seen in the outcome of Epley maneuver with and without neck restrictions in the management of BPPV.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

REFERENCES

1. Papacharalampous GX, Vlastarakos PV, Kotsis GP, Davilis D, Manolopoulos L. The Role of Postural Restrictions after BPPV Treatment: Real Effect on Successful Treatment and BPPV's Recurrence Rates. International journal of otolaryngology. 2012: 932847.
2. Imai T, Takeda N, Ikezono T, Shigeno K, Asai M, Watanabe Y, et al. Classification, diagnostic criteria and management of benign paroxysmal positional vertigo. Auris, nasus, larynx. 2016.
3. Ibekwe TS, Rogers C. Clinical evaluation of posterior canal benign paroxysmal positional vertigo. Nigerian medical journal : journal of the Nigeria Medical Association. 2012; 53(2): 94-101.
4. Caldas MA, Gananca CF, Gananca FF, Gananca MM, Caovilla HH. Clinical features of benign paroxysmal positional vertigo. Brazilian journal of otorhinolaryngology. 2009; 75(4): 502-6.
5. Yetiser S, Ince D. Demographic analysis of benign paroxysmal positional vertigo as a common public health problem. Annals of medical and health sciences research. 2015; 5(1): 50-3.
6. Wang J, Chi FL, Jia XH, Tian L, Richard-Vitton T. Does benign paroxysmal positional vertigo explain age and gender variation in patients with vertigo by mechanical assistance maneuvers? Neurological sciences : official journal of the Italian Neurological Society and of the Italian Society of Clinical Neurophysiology. 2014; 35(11): 1731-6.
7. Maslovara S, Butkovic-Soldo S, Drvis P, Roje-Bedekovic M, Trotic R, Branica S, et al. [Croatian Guidelines for Diagnosis and Management of Benign Paroxysmal Positional Vertigo (Bppv)]. Lijecnicki vjesnik. 2015; 137(11-12): 335-42.
8. Riga M, Bibas A, Xenellis J, Korres S. Inner ear disease and benign paroxysmal positional vertigo: a critical review of incidence, clinical characteristics, and management. International journal of otolaryngology. 2011: 709469.
9. Silva AL, Marinho MR, Gouveia FM, Silva JG, Ferreira Ade S, Cal R. Benign Paroxysmal Positional Vertigo: comparison of two recent international guidelines. Brazilian journal of otorhinolaryngology. 2011; 77(2): 191-200.
10. Karanjai S, Saha AK. Evaluation of vestibular exercises in the management of benign paroxysmal positional vertigo. Indian journal of otolaryngology and head and neck surgery : official publication of the Association of Otolaryngologists of India. 2010; 62(2): 202-7.
11. Epley JM. The canalith repositioning procedure: for treatment of benign paroxysmal positional vertigo. Otolaryngology--head and neck surgery: official journal of American Academy of Otolaryngology-Head and Neck Surgery. 1992; 107(3): 399-404.
12. Toupet M, Ferrary E, Bozorg Grayeli A. Effect of repositioning maneuver type and postmaneuver restrictions on vertigo and dizziness in benign positional paroxysmal vertigo. TheScientificWorldJournal. 2012; 162123.
13. Fyrmpas G, Rachovitsas D, Haidich AB, Constantinidis J, Triaridis S, Vital V, et al. Are postural restrictions after an Epley maneuver unnecessary? First results of a controlled study and review of the literature. Auris, nasus, larynx. 2009; 36(6): 637-43.
14. Balikci HH, Ozbay I. Effects of postural restriction after modified Epley maneuver on recurrence of benign paroxysmal positional vertigo. Auris, nasus, larynx. 2014; 41(5): 428-31.
15. Jia J, Chang D, Dai S, Sang Y, Tai X, Sun X, et al. [The necessity of post-maneuver postural restriction in treating benign paroxysmal positional vertigo]. Lin chuang er bi yan hou tou jing wai ke za zhi = Journal of clinical otorhinolaryngology, head, and neck surgery. 2013; 27(16): 910-2.