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Recommended Citation

Yaqoob, Nasir and Herekar, Arif (2019) "Application of epley maneuver in treating Benign paroxysmal positional vertigo (bppv),"  
*Pakistan Journal of Neurological Sciences (PJNS)*: Vol. 14 : Iss. 1 , Article 6.  
Available at: https://ecommons.aku.edu/pjns/vol14/iss1/6
APPLICATION OF EPLEY MANEUVER IN TREATING BENIGN PAROXYSMAL POSITIONAL VERTIGO (BPPV)

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Date of submission: November 12, 2018 Date of revision: December 28, 2018 Date of acceptance: February 20, 2019

ABSTRACT:

AIM: To evaluate the outcome of Epley Maneuver in treating Benign Paroxysmal Positional Vertigo (BPPV).

MATERIAL AND METHODS: A cross sectional study was done in two private hospitals over a span of 2 years between July 2014 to December 2016. Forty One patients were evaluated who presented with the complains of recurrent episodes of vertigo with change in posture. Epley and other maneuvers were administered to the 41 patients. The data has been presented together with the outcome after Epley maneuver.

RESULT: Out of 41 patients that were encountered for 2 years, results were assessed immediately, one week and one month after performing Epley procedure. Immediately after the procedure, 21 patients (51%) had full resolution of symptoms (vertigo and giddiness), 9 patients (22%) had 70%-80% resolution of symptoms, 7 patients (17%) had 40-50% resolution of symptoms and 4 patients (9%) had no improvement in their symptoms. After one week of follow-up, 30 patients (73%) had full resolution of symptoms, 6 patients (14%) had 70%-80% resolution of symptoms, 3 patients (7%) had 40%-50% resolution of symptoms and 2 patients (4%) had no improvement in their symptoms. After one month of follow-up 35 patients (85%) recovered fully without any symptoms, 3 patients (7%) had more than 80% improvement in their symptoms, 1 (2%) patient had no improvement in the symptoms and 2 patients (4%) lost during the follow up. The posterior semicircular canal was involved in 32 (78.04%) patients, lateral semicircular canal was involved in 6 (14.6%) patients and anterior semicircular canal was involved in 3 (7.31%) patients. Although Epley maneuver has rare adverse effects but in our study 5 patients (12%) had temporary neck pain and stiffness post procedure.

CONCLUSION: In conclusion the Epley Maneuver is safe, reliable and effective procedure that can be performed in general practice at the bedside without having any significant side effects in treating patients with Benign Paroxysmal Positional Vertigo.

KEYWORDS: Epley Maneuver, Benign Paroxysmal Positional Vertigo, BPPV, Patients.

INTRODUCTION.

Benign Paroxysmal Positional Vertigo (BPPV) is a neurological disorder that is characterized by transient attacks of vertigo caused by changes in movement of the head relative to gravity, such as looking upwards, rolling over in bed, or standing up from supine position. The inner ear is concerned with balance of the body and consists of the Anterior, Posterior and Horizontal or lateral semicircular canals which detects rotational movement of the head and angular acceleration, It also consists of otolith organs called the utricle and the saccule which detects linear acceleration due to gravitational forces and displacement of the head, it contains the sensory epithelium called macula. The macula of utricle contains free-floating calcium.
carbonate crystals called as otoconia. Benign paroxysmal positional Vertigo occurs when the otoconia of utricle and saccule comes into the one of semicircular canal when there is movement of the head, the gravity causes calcium carbonate crystals (otoconia) to move within semicircular canals causing vertigo and nystagmus.¹ The onset is common between 5th and 7th decade of life and it is estimated that 2.4 % people have experienced at least once in their life.²

It is important to identify other causes of vertigo before diagnosing Benign Paroxysmal Positional Vertigo which includes spectrum of diseases from benign to life threatening, to exclude other causes, a detailed history and neurological examination is very important, viral infections due to association with labyrinthitis, history of head trauma, recent neurosurgery, ototoxic medications, diabetes and other causes or risk factors may suggest an alternate diagnosis. BPPV occurs suddenly due to head movements and relapses are common, so history of recurrent vertiginous spells with change in posture may suggest Benign Paroxysmal Positional Vertigo (BPPV). BPPV of Posterior semicircular canal is characterized by vertical or torsional nystagmus and horizontal semicircular canal is characterized by horizontal and unidirectional nystagmus.³ The symptoms of BPPV are sudden in onset and are usually exacerbated by the head movements and decrease with rest.⁴ The Dix Hallpike maneuver is a diagnostic test that can be performed to evaluate BPPV, it is based on anatomy of inner ear which settles the otoconia in posterior semi circular canal,it is 79% sensitive and 75% specific. ⁴ Epley maneuver is a series of positional changes of the head which help dislodge the otoconia from the membrane back to the utricle relieving the symptoms. This maneuver is contraindicated in injuries or abnormalities of cervical spine and carotid and vertebral artery dissection.⁵ Epley maneuver is inexpensive and non invasive procedure that can be easily performed at the bedside.⁶

MATERIAL AND METHODS

A cross-sectional study was done in the outpatient departments at two tertiary care private hospitals, The Taj Medical Complex, Hamdard University Hospital, Karachi and National Medical Centre, Karachi, Pakistan from July 2014 to December 2016. Forty One patients were evaluated who presented with the symptoms of recurrent episodes of giddiness mostly on change of posture (Figure 1) along with the nausea and vomiting. Age ranges between 21 to 80 years with the median age of 45 years which included 27 females and 14 males. These patients came from different strata of population and occupation. Along with full neurological examination, various parameters were monitored including infections, history of head trauma/cervical spine injuries and abnormalities, diabetes, history of cardiovascular and cerebrovascular diseases and diagnosis of Benign Paroxysmal Positional Vertigo was made. Written and informed consent was taken and Epley maneuver was administered to all the 41 patients which is the series of head positioning done to move the otoconia out of the semicircular canal. Along with the Epley maneuver, Dix-Hallpike maneuver was performed on 10 (24%) patients, Brandt-Daroff maneuver was performed on 7 (17%) patients and Liberatory maneuver was performed on 6 (14%) patients (Figure 2). The data has been presented together with the outcome after Epley maneuver.

Criteria for Inclusion:
- Patients who have experienced recurrent attacks of vertigo related to change in posture were included in the study.

Criteria for Exclusion:
- Patients who have history of recurrent neck pain, cervical spine injuries, atlantoaxial subluxation, cervical spine spondylitis and carotid or vertebral artery dissection were excluded from performing Epley maneuver.

![Figure 1: Showing Number Of Patients With Symptoms Of Vertigo Related To Posture](image1.png)

![Figure 2 Showing Maneuvers Performed On Patients](image2.png)
Results:

Out of 41 patients that were encountered for 2 years, results were assessed immediately, one week and one month after performing Epley procedure. Immediately after the procedure, 21 patients (51%) had full resolution of symptoms (vertigo and giddiness), 9 patients (22%) had 70%-80% resolution of symptoms, 7 patients (17%) had 40%-50% resolution of symptoms and 4 patients (9%) had no improvement in their symptoms. After one week of follow-up, 30 patients (73%) had full resolution of symptoms, 6 patients (14%) had 70%-80% resolution of symptoms, 3 patients (7%) had 40%-50% resolution of symptoms and 2 patients (4%) had no improvement in their symptoms. After one month of follow-up 35 patients (85%) recovered fully without any symptoms, 3 patients (7%) had more than 80% improvement in their symptoms, 1 (2%) patient had no improvement in the symptoms and 2 patients (4%) lost during the follow up. The posterior semicircular canal was involved in 32 (78.04%) patients, lateral semicircular canal was involved in 6 (14.6%) patients and anterior semicircular canal was involved in 3 (7.31%) patients. Although Epley maneuver has rare adverse effects but in our study 5 patients (12%) had temporary neck pain and stiffness post procedure.

DISCUSSION

Benign Paroxysmal Positional Vertigo (BPPV) can be diagnosed clinically, it usually occurs in elderly individuals. Warning signs include focal neurological deficit, numbness, ataxia, sudden unilateral loss of hearing and history of unconsciousness which needs to be evaluated and full neurological exam should be performed. A retrospective study showed 47% patients were symptom free after single application of Epley Maneuver and 84% patients experienced symptomatic improvement after three maneuvers. 6 Benign Paroxysmal Positional vertigo commonly affects the posterior semicircular canal due to impact of gravity when patient is in upright or supine posture, 7 in our study we encountered 32 out of 41 patients (78.04%) to have posterior canal involvement. Horizontal Semicircular canal BPPV is usually caused by the head movement when one turns over in bed and it is diagnosed by the Pagnini-McClure maneuver also called as supine roll test. 8 According to Cohen et al, hypertension and diabetes were present in 36% of patients and diabetes was more common in patients with BPPV. 9 Another literature review showed the rate of success after 1 week post Epley maneuver was 63.6% which was increased to 72.7% after 2 weeks. 10 A meta-analysis showed that patients on which Epley’s maneuver was performed had 6.5 times improvement in their symptoms as compared to the control group of patients (OR = 6.52; 95% CI, 4.17–10.20). 11

In another study Sermon maneuver was performed on four hundred and twelve patients when symptoms did not resolve, three successful Epley maneuvers were performed which cured 98% of the patients. 12 In our study we also performed Liberatory, Sermon, Dix Hall pike maneuver in some and Epley maneuver on all patients which showed that the Epley maneuver is more successful as compared to the above maneuvers. In a randomized controlled trial after performing the EPLEY maneuver administration of Betahistine can also speed up the recovery of the patients. 13 However in our study we did not administer Betahistine in any patient.

Adverse outcomes are rare but include transient neck pain, nausea and cervical spine injury after the Epley procedure. 14 According to Cranfield S et al in British Journal of General Practice, 2010, BPPV can be treated with Epley Maneuver in the clinical practice and help in reducing the rate of referrals to the specialists. 15 Awareness and proper training should be given to neurologists, ENT specialists and general practitioners who perform Epley maneuver and diagnose Benign Paroxysmal Positional Vertigo.

CONCLUSION

In conclusion the Epley Maneuver is safe, reliable and effective procedure that can be performed in general practice at the bedside without having any significant side effects in treating patients with Benign Paroxysmal Positional Vertigo.

Conflict of interest: Author declares no conflict of interest.
Funding disclosure: Nil
Author’s contribution:
Nasir Yaqoob; concept, data collection, data analysis, manuscript writing, manuscript review
Arif Herekar; data collection, data analysis, manuscript writing, manuscript review