

Effects of Post-maneuver Restrictions on Efficacy of Epley Maneuver in Benign Paroxysmal Postional Vertigo

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ABSTRACT: **OBJECTIVE:** To compare the efficacy of Epley Maneuver with and without post-maneuver restrictions in patients of benign paroxysmal positional vertigo. **STUDY DESIGN:** Cross sectional study. **SETTING:** Department of ENT Head & Neck Surgery, Shifa Naval Hospital, Karachi. **DURATION:** It was a 13 months study carried out from 10th March, 2007 to 10th April, 2008. **SUBJECTS AND METHODS:** We recruited 60 patients with a history of positional vertigo and dizziness or unilateral positional nystagmus on Dix-Hallpike maneuver. Patients were divided in two equal groups of thirty each. Study group (Group I), received post-maneuver instructions while Control group (Group II), was not instructed. Measured outcomes included resolution of vertigo and positional nystagmus at follow-up after 72± 24 hours. **RESULTS:** No significant difference was found between Group I (with instructions) and Group II (without instructions) (p value = .584) **CONCLUSION:** Post-maneuver restrictions do not influence the efficacy of Epley Maneuver for BPPV management.

Key Words : Benign paroxysmal postional vertigo, Dix-Hallpike test, Epley maneuver, Post-maneuver restrictions.

INTRODUCTION : Vertigo can be described as an unreal sense of movement, or the illusion of rotational motion, is due to asymmetry in vestibular nucleus activity¹. It may be experienced as a sensation of spinning (subjective vertigo) or a sensation of the world spinning about one's self (objective vertigo)². It can be either episodic lasting for seconds to minutes or continuous lasting for weeks to months. Vertigo should be distinguished from dizziness, which describes any kind of altered sense of orientation, including light-headedness, unsteadiness, motion intolerance, imbalance, floating, or a tilting sensation. True vertigo is often due to inner ear disease, whereas non vertiginous symptoms may be due to CNS, cardiovascular, or systemic diseases. Benign paroxysmal positional vertigo (BPPV) is the most common cause of peripheral vertigo³, with an incidence that varies between 11 and 64 cases per 100 million, predominantly in the age range between 50 and 55 years in idiopathic cases⁴, and very rarely in childhood⁵. BPPV is characterized by brief spells of vertigo, nausea and/or positional nystagmus at head position change⁶. After the vertigo spell, a vague feeling of floating-like dizziness may persist for hours, or even days; the intensity of BPPV clinical manifestations and its recurrent character may impact a patient's professional, social and domestic activities⁶. In most cases, BPPV is found in isolation and termed "primary" or "idiopathic" BPPV. This type accounts for about 50%-70% of cases. The most common cause of "secondary" BPPV is head trauma, representing 7%-17% of all BPPV cases³. BPPV may be associated with inner ear surgeries in 1% of the cases, and the highest risk for its development is detected in stapes surgeries (stapedectomy and stapedotomy)⁷. As to the pathophysiology, BPPV occurs due to the inappropriate stimulation of SCC hair cells, in response to the changes in head position with respect to the gravity, by sequestered otoconia³. There are two theories: cupulolithiasis, in which statocone debris are attached to the cupula⁸, and canalolithiasis, in which the debris

float freely in the endolymph along the semicircular canal involved⁹. This condition presents as dizziness or vertigo of sudden onset that is provoked by certain changes in head position. An attack is usually triggered when the patient lies back on the affected side, rolls over onto that side, sits up quickly or tilts the head back while looking up. A latent period of few seconds after the head movement is followed by a severe vertigo, which usually lasts less than 1 minute. Dix-Hallpike testing is positive when a rotatory nystagmus is induced with the affected ear dependent, a response that is usually fatigable. The natural clinical course of BPPV is self-limiting and takes from weeks to months, and it normally does not respond to antivertigo drugs¹⁰. Advocated treatments are various: maneuvers of canalith repositioning¹¹. Epley maneuver is the most common one (success rate near 90%), liberatory maneuvers, Semont maneuver, vestibular habituation training³, and surgical treatments such as singular neurectomy or occlusion of posterior semicircular canal that are reserved to cases non-responsive to clinical treatment. BPPV is the most common cause of vertigo in our ENT out patient department and Epley's manoeuvre is one of most effective particle repositioning manoeuvre. In this study, conducted at PNS Shifa, restrictions after repositioning measures¹² are questioned, as many studies have been conducted to compare groups but no difference has been observed between the two study groups¹³. This will help to minimize the discomfort caused by the restrictions imposed on patients after performing of the procedure. Limiting of restrictions to one group does not carry an ethical issue as these restrictions are not a proven treatment modality and if they are found to be beneficial the second group can always be given the restrictions after the study.

SUBJECTS AND METHODS :

A prospective study has been conducted at PNS Shifa Karachi since March 2007 till April 2008. A total of 60 patients with BPPV were selected from general

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population including mostly army personnel and their families, and a few civilians as well, reporting to the E.N.T. department PNS Shifa Karachi. Total 60 cases, divided in two equal groups of thirty each. Studied group (Group I), received post-maneuver instructions while Control group (Group II), was not instructed. Inclusion Criteria:

- Both sexes.
 - All patients of age between 15 to 65 years.
 - Patients with Positive Dix-Hallpike test.
 - Patients agreed to participate in the study.
- Exclusion Criteria:
- Presence of neck restrictions that will prevent conduction of Epley Maneuver.
 - Patients using anti-vertigo drugs.

Study was approved from Hospital Ethical Committee. A clear understanding of risk and benefit ratio (no risk involved) of the procedure was given to each patient before starting the maneuver and informed consent was taken. After approval of synopsis sixty patients presenting in Out Patient Department of PNS Shifa fulfilling the inclusion criteria were included. Patients were subjected to Dix-Hallpike test and it was considered positive in case of triggering of dizziness and/or presence of horizontal-rotation nystagmus, clockwise to left canal and anti-clockwise to the right canal, in Rose's position with hyperextension and lateral neck rotation. Patients with positive Dix-Hallpike test were submitted to Epley Maneuver. After repositioning, patients were randomized to two groups: Studied group (Group I), who have received post-maneuver instructions. Control group (Group II), who were not instructed. Patients were re-assessed 72 hours after the Epley Maneuver and were divided into two categories: asymptomatic and symptomatic (in both the groups). Patients were considered asymptomatic on exclusion of main complaint and absence of dizziness and/or nystagmus in Dix-Hallpike test. Patients were considered symptomatic that reported partial improvement or absence of improvement after the maneuver and showed positive Dix-Hallpike test. Data was collected in the carefully structured Proforma. Data Analysis:

Data was analyzed using Software SPSS-11. The variable in the study is presence of residual symptoms associated with positive result of Dix-Hallpike test. Chi-square test was used to assess the difference of results between the group that was instructed and the group without instructions. The level of significance was $p < 0.05$. Mean and standard deviation of age, frequency and percentage of sex were given.

RESULTS : The study was conducted on 60 patients with benign paroxysmal positional vertigo. In 30 cases after Epley's manoeuvre post-maneuver restrictions were given (Group I) and then compared for complete resolution of symptoms mainly vertigo, with the 30 cases which had not received any instructions (Group II). The age of patients in this study was from 32 years to 75 years with a mean age incidence of 53.22 ± 9.64 years. Mean age of patients in group I which were given instructions was 52.00 SD \pm 9.727. There was no significant difference between two groups with respect to age as shown in Table 1. Most numbers of patients were in age group 41-60 years (Fig 1). While assessing

post maneuver progression considering different age groups no statistically significant difference was found ($p=0.449$). Patients belonging to every class were included in this study but most of the patients were serving army personnel and their families. Out of these 60 patients 55% were males and 45 % were females. Out of those 30 cases that were given post-maneuver instructions (Group I) 46.66 % were males and 53.33 % were females. Out of those which were not given instructions (Group II) 63.33 % were males and 36.66 % were females as shown in Fig 2. The categorical data of the two groups regarding improvement of symptoms was analyzed and crosstabulation is shown in Table 2. The Chi-Square test was applied to compare improvement of symptoms in two groups and it proved the Null hypothesis to be correct. Hence the difference of results between the group that was instructed (Group I) and the group which was not instructed (Group II) was not statistically significant ($p=0.584$) as shown in Table 3.

DISCUSSION : Benign paroxysmal positional vertigo (BPPV) is the most common peripheral vestibular disorder in adults^{3,14}. This condition presents as dizziness or vertigo of sudden onset that is provoked by certain changes in head position. Rolling over in bed, bending over, and looking upward are the most common provocative movements¹⁵. Despite the seemingly simple and straight forward pathophysiology and treatment of benign paroxysmal positional vertigo, the diagnosis and treatment of this condition can be challenging^{3,16}. In this study the results indicates 40 (66.66%) of the 60 patients became asymptomatic after Epley's maneuver when assessed within 24-72 hours after conduction of the procedure. This data is in accordance with the literature, which suggests a success rate of the maneuver in about 60% to 90% of the cases as an effective treatment approach of BPPV^{9,17}. As to gender distribution, literature suggests female predominance¹⁸ but we observed slight predominance of male patients (55%), but this is note worthy that quite a significant number of female patients who were recruited in study didn't turn up for follow up and we had to drop them from the study. This is also interesting to note, studies report female predominance but when we consider younger age ranges, in which the main etiology is head trauma, as a secondary cause, the correlation between genders has no difference. Despite slight male predominance in our study, when we consider clinical response to treatment between males and females, results do not show statistically significant differences between genders. (Table 1 & Fig 2) The mean age of the studied population was 53.22 ± 9.639 years and 25 % of the patients in the sample were aged over 60 years as in other studies¹⁹. Because of associated co-morbid conditions in the elderly the diagnosis of BPPV is made more frequently. In this age group, the disease has more impact on patient's professional, social and domestic activities¹⁵. In our study 15 patients were above 60 years still it is interesting to note that even though the elderly were more exposed to the disease, the efficacy of repositioning maneuver is the same as the one observed in other age ranges²⁰. Despite the fact that there is no question regarding the efficacy of the liberatory manoeuvres⁹ still there are areas of divergence on which researchers are still not agreed. The use of mechanical



Fig-1 : Frequency of age of patients.

vibration of the mastoid bone and medication for sedation during Epley’s maneuver are still controversial. Some professionals have continued to use this technique, whereas others do not²¹. Comparison of initial vertigo relief and long term resolution of symptoms does not demonstrate any advantage for those receiving vibration. Second area of controversy is variation in the literature on how many repositioning manoeuvres are performed in each treatment session. Some perform a set number of repositioning manoeuvres per session regardless of response²². Others perform manoeuvres until there is resolution of nystagmus or patient’s discomfort prohibits continuing with treatment^{23,24}. A third group believes that only one manoeuvre should be performed per clinic visit²¹. In our study each patient received only one manoeuvre, however few older patients and some females were not co-operative during the manoeuvre and we had to discontinue and restart the manoeuvre. Like the first two scenarios another area of divergence is the activity limitations placed on patients after repositioning manoeuvres. Epley²³ suggested that his patients remain upright for 48 hours after CRP, and many professionals continued with this practice²⁵. Furthermore, another group of professionals, in addition to having patients remain upright, also suggested that patients avoid lying with their affected ear downward for 7 days after repositioning²². Nuti and colleagues in examined two sets of patients following the Seamount manoeuvre. Fifty-six patients with posterior canal benign paroxysmal positional vertigo underwent the Seamount manoeuvre and were checked after 20 minutes, 24 hours, and 1 week. The patients were told that they could sleep or move as they pleased, without any particular precautions. These two groups were compared retrospectively and no difference was found in short-term vertigo control. In a more recent study by Casqueiro and colleagues²⁶ in 2008 compared two groups of patients. Two hundred and they seven patients diagnosed during the first year of study were instructed to follow postural restrictions after repositioning maneuvers, and 184 patients who were diagnosed in the second year did not receive any postural restriction after treatment. The outcome measures were, number of maneuvers needed until symptoms resolved,

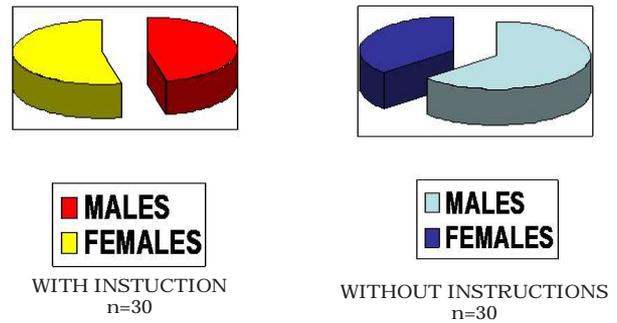


Fig-2 : Gender distribution.

Post maneuver Instructions	Improvement of symptoms		Total
	Asymptomatic	Symptomatic	
With instructions	21	9	30
Without instructions	19	11	30
Total	40	20	60

Table-2 : Improvement of symptoms in both groups (Crosstabulation).

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.300(b)	1	.584		
Continuity Correction(a)	.075	1	.784		
Likelihood Ratio	.300	1	.584		
Fisher's Exact Test				.785	.392
N of Valid Cases	60				

Table-3 : Improvement of symptoms in both groups (Chi-Square Tests).

recurrence rate, and subjective recovery at the end of treatment between both groups. There were no statistical differences found in respect of all these measures. In our study 21 out of 30 patients become asymptomatic after they were given post-maneuver restrictions as compared to the 19 out of 30 asymptomatic patients who didn't receive any instruction. This finding is consistent with an earlier prospective studies by Massoud and Ireland²⁵ and Cohen and Kimball in 2004²⁷, who also demonstrated that post-liberatory maneuver instructions were not efficacious.

All these instructions, though have anatomical and physiological basis make BPPV treatment very complex matter for the patient and he or she has to adopt a certain style of living for which they are not use to. Secondly another draw back of restrictions is that after their period is over, patients feel great anxiety to start the head movements once again, as they start considering them a cause of their disease. These changes in habits and life style significantly affect the older population who start experiencing muscular pain due to assuming a specific posture for long time and elderly population is significantly more affected by BPPV¹⁸. It is concluded that Epley’s maneuver is a simple option for the treatment of BPPV with satisfactory outcomes, whether posture restrictions are advised or not. The actual cause of BPPV is still questionable, but it seems clear that the initial proposition that repositioned particles would tend to get back to the posterior semicircular canal as a response to the position of the head is debatable. Only time and conduction of studies on the topic will clarify these facts. As our results are in accordance with those

reported by other authors^{24,25} who did not detect better clinical evolution in patients submitted to different postures, it seems to be reasonable that there is no reason to submit our patients to these very uncomfortable recommendations. It is also recommended that further studies are required to carry out same maneuver in hospitalized patients with strict observations so that we can actually assess the impact of post-maneuver guidance on efficacy of this maneuver and secondly different neck and body movements performed by different patients may also be notified and compared with results.

CONCLUSION : The present study suggests that Epley's maneuver is an effective treatment option in the majority (70%) of patients of posterior canal BPPV. Post-maneuver postural restrictions have no significant effect on the efficacy of Epley's maneuver.

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