CLINICAL COMPARATIVE STUDY OF EFFICACY OF EPLEY MANOEUVRE AND SEMONT MANOEUVRE IN BENIGN PAROXYSMAL POSITIONAL VERTIGO

Mian Amer Majeed, Anwar Ul Haq*, Syed Muhammad Asad Shabbir, Syed Nusrat Raza*****

Military Hospital Rawalpindi, *Combined Military Hospital Okara, **Level III Hospital Darfur Sudan, ***Combined Military Hospital Multan

ABSTRACT

Objective: To compare the efficacy of Epley manoeuvre and Semont manoeuvre in the management of benign paroxysmal positional vertigo.

Study Design: Randomized controlled trials.

Place & Duration of Study: ENT Department Combined Military Hospital (CMH) Kharian and Gilgit from March 2005 to February 2010.

Material and Methods: Hundred cases of benign paroxysmal positional vertigo (BPPV) were selected on Dix-Hallpike test by non probability convenient sampling technique and randomly divided into two groups of 50 cases each. Patients in group-1 were treated by Epley manoeuvre and patients in group-2 were treated by Semont manoeuvre. The patients were examined on first day, 3rd day, 7th day and after 01 month and clinical results were observed.

Results: In group-1, 68% cases showed immediate resolution of symptoms, 74% cases on 3rd day, 80% cases on 7th day and total 82% cases recovered completely after one month. In group-2, 62% cases showed immediate resolution of symptoms, 68% cases on 3rd day, 74% cases on 7th day and total 78% cases showed complete recovery after 1 month. There was insignificant difference between the two groups regarding recovery at different follow ups.

Conclusion: It was concluded that Epley and Semont manoeuvres are equally effective in the management of BPPV.

Keywords: Benign Positional Vertigo, Epley manoeuvre, Semont manoeuvre.

INTRODUCTION

Benign paroxysmal positional vertigo (BPPV) is the most common disorder of the peripheral vestibular systemand represents some 17% of vertigo cases reported in ENT unit[1]. The mean age of occurrence is the mid 50's, it is more common in women than in men[2,3]. The underlying mechanism is unclear. Anatomic[4] work and surgeons' observations[5] have suggested that it is caused by displacement of otoconial matter into the lumen or onto the cupula of the posterior semicircular canal (i.e., canalithiasis and cupulolithiasis, respectively). 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.

BPPV is evoked by 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. It can be diagnosed by Dix Hallpike test.

BPPV has often been described as "self-limiting" because symptoms often subside or disappear within six months of onset. A variety of management approaches to BPPV has been described. Medical therapy with vestibular suppressants is generally ineffective[13]. Habituation exercises[6] used in the past, are rarely used today for BPPV.Surgical procedures are highly effective, but they have substantial risk and should only be used in persistent and incapacitating cases. Several physical manoeuvres have been described to manage the underlying pathophysiology of BPPV. The

Correspondence: Dr Mian Amer Majeed, ENT Department, MH Rawalpindi
Email: majeed.amer@gmail.com
Received: 29 Mar 2013; Accepted: 13 Mar 2014

manoeuvres, named after their inventors, are intended to move debris out of the sensitive part of the ear (posterior canal) to a less sensitive location (the utricle). The first of these manoeuvres was the liberatory manoeuvre described by Semont[7] in 1988 then Epley[6,8,9] described the canalith repositioning procedure(CRP). CRP with various modifications is popular physical manoeuvre for management of BPPV . The modification of this manoeuvre[11] termed the particles repositioning manoeuvre (PRM), have become more popular.

BPPV is the most common cause of vertigo in our ENT outdoor patient departments. It is very important for us to select appropriate and better manoeuvre in terms of efficacy for management of posterior canal BPPV. The objective of this study was to compare the efficacy of Semont manoeuvre and Epley manoeuvre in the management of benign paroxysmal positional vertigo. Main outcome measure was freedom from vertigo and negative Dix-Hallpike test after 01 month of treatment.

MATERIAL AND METHODS

These randomized controlled trials were conducted at ENT out Patient Department Combined Military Hospital Kharian and Gilgit from March 2005 to 28 February 2010. All the cases of posterior canal benign paroxysmal positional vertigo, diagnosed by Dix Hallpike test, age between 15 to 65 years of both the gender were included in the study.

Patients of cervical spondylosis on X-Rays cervical spines, patients had recent head or neck injury, associated medical illnesses e.g. Ischeamic Heart Disease, Hypertension, Diabetes Mellitus, Anaemia and Postural Hypotension, case with other causes of vertigo, Bilateral cases of benign positional vertigo, Transient Ischaemic Attacks, Carotid Bruit positive were excluded in the study.

Total 100 patients were included in the study through non-probability convenience sampling. Every patient of vertigo was assessed by detailed history, examination and relevant investigations. Patients were randomly divided in two groups of 50 each using random numbers table. All patients gave informed consent to the treatment. Patients in group-1 were treated by Epley manoeuvre and patients in group-2 were treated by Semont manoeuvre.

Data was collected as per performa. Patients were examined on first sitting, third day, and seventh day and after one month. On first sitting, after detailed history and examination, diagnosis of benign paroxysmal positional vertigo (BPPV) was made.

Epley manoeuvre was started with the patient sitting in head upright position. Then the Dix-Hallpike provoking position was assumed. Then patient was observed for nystagmus until it stopped. After 30 seconds, patient's head was turned to opposite side while keeping the head extended Dix-Hallpike position for 2 seconds and then patient was rolled into right lateral position while head and trunk positions were maintained. In this position the head was at 180 degrees opposite to initial Dix-Hallpike position. After the disappearance of nystagmus for 30 seconds maintaining the head position, the patient was brought rapidly to sitting position with the head forward and used to wait for 01 minute. The procedure was stopped after 01 cycle if nystagmus or dizziness stopped. Otherwise whole procedure was repeated to a maximum of 06 cycles per session. Each cycle took 3 minutes. After the manoeuvre, the patients were advised to rest in a semi-recumbent position at 45 degrees angle for 02 days and avoid symptom provoking position for 01 week.

The Semont manoeuvre (Figure-1) was used when the affected side is clearly known after Dix-Hallpike test. The patient used to sit with head turned 45degrees angle opposite to the involved side. The patient then moved to side lying on the affected side while maintaining the head at 45 degrees angle. This position used to provoke vertigo and nystagmus. This position was maintained for 2-3 minutes then the patient was brought to opposite side lying position. The

patient used to maintain 45 degrees angle head rotation towards the unaffected side with the head facing downward. If the patient was not experiencing vertigo on the second position, the head used to be shaken once or twice in an attempt to free otolithic debris. The patient used to stay in this position for 5 minutes and was slowly brought to sitting. Following this manoeuvre, the patients were advised to rest in a semi-recumbent position at 45 degrees angle for 02 days and avoid symptom provoking position for 01 week. The patient was followed up on 3rd day, 7th day and after 01 month. I used to record efficacy of treatment in terms of resolution of vertigo and nystagmus on Dix-Hallpike test. Patients having symptoms of vertigo were again treated with Epley or Semont manoeuvres according to previous treatment. The recovered patients were only followed up at 3rd , 7th and after 01 month with Dix-Hallpike testing.

These results were analyzed using the SPSS version[16]. Frequencies and percentages were calculated for qualitative variables and compared through chi-square test while mean and standard deviation were calculated for quantitative variables and compared through independent samples' t-test. A *p*-value < 0.05 was considered as significant.

RESULTS

One hundred patients were included in the study and randomly divided into two groups of 50 each. Average age in group-1 was 46.39 years (SD = 12.09, Range: 27 to 62 years) and in group-1 it was 47.54 years (SD = 10.35, Range: 30 to 64 years). In group-1, 46% were males while in group-2, 50% were males. Both the groups are comparable with respect to age (*p* = 0.604) and gender (*p* = 0.689). BPPV was on right side in 48% cases in group-1 and in 58% cases in group-2 (p = 0.316).

In group-1, 68% cases showed immediate resolution of symptoms, 74% cases on 3rd day, 80% cases on 7th day and total 82% cases recovered completely after one month. In group-

Table-1: Comparison of recovery between both the groups.

Follow up	Group-1 (n = 50) (Epley Manoeuvre)	Group-2 (n = 50) (Semont Manoeuvre)	*p*-value
First day	34 (68%)	31 (62%)	0.529
3rd day	37 (74%)	34 (68%)	0.508
7th day	40 (80%)	37 (74%)	0.476
One month	41 (82%)	39 (78%)	0.617

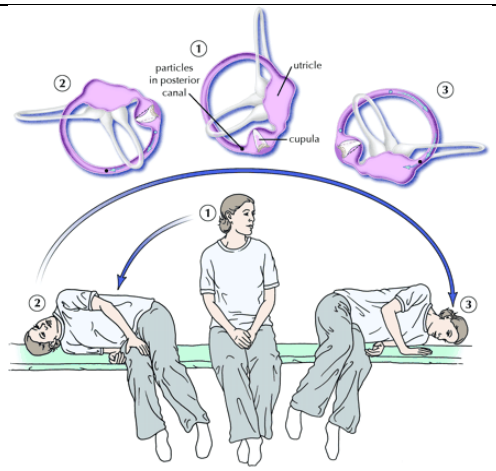

Figure-1: Description of semont manoeuvre.

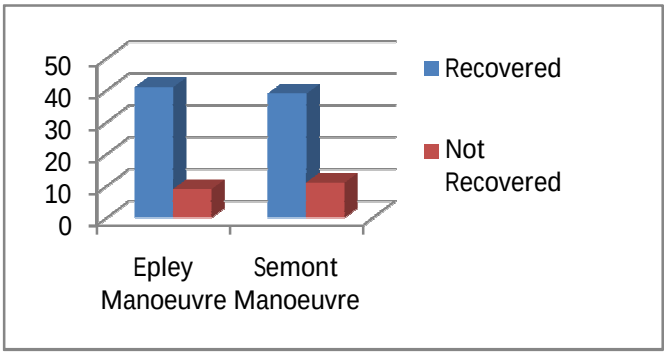

Figure-2: Comparison of response between the two groups after one month.

2, 62% cases showed immediate resolution of symptoms, 68% cases on 3rd day, 74% cases on 7th day and total 78% cases showed complete recovery after 1 month. There was insignificant difference between the two groups regarding recovery at different follow ups (table-1 & fig-2).

DISCUSSION

The aim of this study was to compare the efficacy of Epley manoeuvre and Semont manoeuvre in the management of BPPV. A total of 100 patients with BPPV were selected. Main outcome measure was freedom from vertigo and negative Dix-Hallpike test after 01 month of treatment. Epley manoeuvre was performed in 50 cases.

Epley's initial publication on the use of bedside treatment for benign paroxysmal positional vertigo reported an 80 percent success rate after a single treatment session and a 100 percent success rate when there was more than one treatment session[8]. Subsequently, several open clinical trials reported success rates ranging from 44 percent to 88 percent[11,14,25]. A randomized, controlled trial performed by Lynn et al[19] reporteda success rate of 89 percent after a single treatment session, as compared with a success rate of 23 percent in an untreated control group. Another group, using the Epley manoeuvre, observed a good initial response in their cohorts of 151 patients. 87% were symptom free at 1 week[16]. Ahmed et al observed 79.7% complete response after single treatment with Epley manoeuvre but on follow up, observed 65.4% complete response after 3 months[21]. Bromwich M et al intervened a home device based on modification of Epley manoeuvre (Particle Repositioning Manoeuvre). 88% of cases were successfully treated in that they tested negative on the Dix-Hallpike test after 01 week[18].

In 1988, Semont et al[17] reported the results of the liberatory manoeuvre for the treatment of BPPV with 84% of cure following a single treatment. Nuti et al[12] reported their experience using the liberatory manoeuvre in 56 patients. They had excellent short-term result (89% success) but followed their patient for only 1 week. The Semont manoeuvre is effective and demonstrates 90.3% recovery rate in a study after 4 manoeuvres[10]. The manoeuvre was performed once weekly for a month. Niamatullah and Yousaf N[22] reported 70% cure rates with Semont manoeuvre and 57% cure rates with Epley manoeuvre. Comparison of studies was shown in Fig-1. They concluded that single treatment approaches with both physical manoeuvres were equally effective. Studies that have compared the efficacy of two manoeuvres indicated that there was no significant difference between the effectiveness of Epley and Semont manoeuvres[14, 23].

The results of this study concurred with a previously reported controlled trials that both Semont and Epley manoeuvres were equally effective and there was no significant statistical difference between the efficacies of both manoeuvres.

BPPV is more common in women than in men[2,3]. In this study, it was observed that 47% of patients were women. This observation supported the previous studies. Decreased estrogen levels may disturb the internal structure of the otoconia or their interconnections and attachments to the gelatinous matrix. In a recent study, bone mineral density score was decreased in both women and men with idiopathic BPPV compared with that in normal controls[17]. Further studies must be carried out to prove these evidences.

The manoeuvres used in this study differed slightly from previous modifications of these treatments. Previous reports have described holding the subject's head on each position for periods up to 2 to 4 minutes. Cohen and Jerabek[24] held each subject's head for brief period of time. They indicated that subjects were uncomfortable when their heads were held for so long. This study supported the work of Cohen and Jerabek by holding subject's head for short period of time.

In Epley's original description of the CRP[8], he used mechanical vibration of the mastoid bone

and medication for sedation. He believed that vibration would help loosen otolithic debris adherent to the membrane of posterior semicircular canal. Some professionals have continued to use this technique[16], whereas others do not[13]. Comparison of initial vertigo relief and long term resolution of symptoms does not demonstrate any advantage for those receiving vibration. Additionally, Hain et al. performed a randomized trial comparing patients receiving the CRP and vibration with patients treated with CRP alone[15]. They found no significant differences in treatment effectiveness at the 01 month assessment or in long term recurrence of BPPV. In this study, mechanical vibration of mastoid bone and medications were not used during CRP.

There 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 response[15]. Others perform manoeuvres until there is resolution of nystagmus or patient's discomfort prohibits continuing with treatment[8,16] .A third group believes that only one manoeuvre should be performed per clinic visit[13].In this study, maximum 06 cycles of manoeuvres were performed per session until there is resolution of nystagmus on Dix-Hallpike test. This supported the work of Gordon CR and Gadoth N[26].

Another area of divergence is in the activity limitations placed on patients after repositioning manoeuvres. Epley[8] requested that his patients remain upright for 48 hours after, and many professionals continued with this practice[16]. Furthermore, another group of professionals, in addition to having patients remain upright, also requested that patients avoid lying with their affected ear downward for 7 days after repositioning[15]. Nuti et al[12] further addressed this issue in their patients who received the liberatory manoeuvre. Initially, their patients were told to remain upright for 48 hours after repositioning. Later, a second group of patients were given no postmanoeuvre instructions. They found that short term vertigo control was equivalent between these two groups. The further studies are needed to prove this evidence.

CONCLUSION

BPPV is the most common cause of peripheral vertigo and it must be diagnosed early in outpatient department by Dix-Hallpike test. Physical manoeuvres are performed primarily for treatment. Epley and Semont manoeuvres both are equally effective for majority of patients with posterior semicircular canal BPPV.

Conflict of Interest

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

REFERENCES

1. Nedzelski JM, Barber HO, McIlmoyl L. Diagnoses in a dizziness unit. J Otolaryngol 1986; 15:101-4.
2. Shirabe S. Vestibular neuronitis in childhood. Acta Otolaryngol Suppl (Stockh) 1998; 485:120-2.
3. Mizukoshi K, Watanabe Y. Epidemiological studies on benign paroxysmal positional vertigo in Japan. Acta Otolaryngol Suppl (Stockh) 1988; 447: 67-72.
4. Moriarty B, Rutka J, Hawke M. The incidence and distribution of cupular deposits in the labyrinth. Laryngoscope 1992; 102: 56-69.
5. Parnes LS, McClure JA. Free floating endolymph particles: a new operative finding during posterior canal occlusion. Laryngoscope 1992; 102: 988-92.
6. Norre ME, Beckers A. Benign paroxysmal positional vertigo in the elderly: treatment by habituation exercises. J Am Geriatr Soc. 1988; 36: 425-9.
7. Semont A, Freyss G, Vitte E. Curing the benign paroxysmal positional vertigo with a liberatory manoeuvre. Adv Otorhinolaryngol 1988; 42: 290-3.
8. Epley JM. The canalith repositioning procedure: for treatment of benign paroxysmal positional vertigo. Otolaryngol Head Neck Surg 1992; 107: 399-404.
9. Mujeeb M, Khan N. BPPV. J Laryngol Otol 2000; 114: 844-7.
10. Levrat E, Melle G, Monnier P, Maire R. Efficacy of the semont maneuver in benign paroxysmal positional vertigo. Arch Otolaryngol Head Neck Surg 2003; 129: 629-33.
11. Parnes LS, Price-Jones RG. Particle repositioning maneuver for benign paroxysmal positional vertigo. Ann Otol Rhinol Laryngol 1993; 102: 325-31.
12. Nuti D, Nati C, Passali D. Treatment of benign paroxysmal positional vertigo: no need for postmaneuver restrictions. Otolaryngol Head Neck Surg 2000; 122: 440-4.
13. O'Reilly RC, Elford B, Slater R. Effectiveness of the particle repositioning maneuver in subtypes of benign paroxysmal positional vertigo. Laryngoscope 2000; 110: 1385-8.
14. Herdman SJ, Tusa RJ, Zee DS, Proctor LR, Mattox DE, Single treatment approaches to benign paroxysmal positional vertigo. Arch Otolaryngol Head Neck Surg 1993; 119: 450-4.
15. Hain TC, Helminski JO, Reis IL. Vibration does not improve results of the canalith repositioning procedure. Arch Otolaryngol Head Neck Surg 2000; 126: 617-22.
16. Nunez RA, Cass SP, Furman JM. Short and long term outcomes of canalith repositioning for benign paroxysmal positional vertigo. Otolaryngol Head Neck Surg 2000; 122: 647-52.

17. Jeong SH, Choi SH, Kim JY, Koo JW, Kim HJ, Kim JS. Osteopeniaand osteoporosis in idiopathic benign positional vertigo. Neurology 2009; 72: 1069-76.
18. Bromwich M, Hughes B, Raymond M, Sukerman S, Parnes L. Efficacy of a new home treatment device for benign paroxysmal positional vertigo. Arch Otolaryngol Head Neck Surg 2010; 136(7): 682-5.
19. Weider DJ, Ryder CJ, Stram JR. Benign paroxysmal positional vertigo: analysis of 44 cases treated by the canalith repositioning procedure of Epley. Am J Otol 1994; 15: 321-6.
20. Lynn S, Pool A, Rose D, Brey R, Suman V. Randomized trial of the canalith repositioning procedure. Otolaryngol Head Neck Surg 1995; 113: 712-20.
21. Ahmed Z, Akhtar MR, Ahmed T, Raza N, Ayub W. Modified Epley's manoeuvre for treatment of benign positional vertigo: An experience with over 100 cases. Pak Armed Forces Med J 2003; 53:160-3.
22. Naimatullah, Yousaf N. Single treatment approaches to benign paroxysmal positional vertigo. Pak J Otolaryngol 2004; 20: 3-5.
23. Massoud ES, Ireland DJ. Post-treatment instructions in the nonsurgical management of benign paroxysmal positional vertigo. J Otolaryngol 1996; 25:121-5.
24. Cohen HS, Jerabek J. Efficacy of treatments for posterior canal benign paroxysmal positional vertigo. Laryngoscope1999; 109:584-90.
25. Waleem SS, Malik SM, Saeedullah, Hassan Z. Office management of benign paroxysmal positional vertigo with Epley's manoeuvre. JAMCA 2008; 20(1):77-9.
26. Gordon CR, Gadoth N. Repeated vs single physical maneuver in benign paroxysmal positional vertigo. Acta Neurol Scand 2004; 110: 166-9.

.....