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DIFFERENCES EFFECTS OF ADDITIONAL BETAHISTINE MESYLATE AND BRANDT-DAROFF TRAINING AFTER MANUEVER EPLEY ON PATIENT TREATMENT BENIGN PAROXYSMAL POSITIONAL VERTIGO

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Abstract

Background: Benign Paroxysmal Positional Vertigo (BPPV) is a common disease with very disturbing symptoms. The maneuver used in the treatment of BPPV is the Epley Maneuver. Administration of Betahistine and Brandt-Daroff Exercise are also beneficial in the treatment of BPPV. The aim of the study was to determine the difference in the effect of adding Betahistine mesylate and Brandt-Daroff exercise after the Epley Maneuver on the treatment of BPPV.

Method: This is a true experimental study on a population of BPPV patients at RSUP H Adam Malik Medan, which were taken consecutively from January to December 2019. The diagnosis of BPPV was based on the Dix hallpike examination and after that the Epley Maneuver was performed. The sample was further divided into three intervention groups, namely the first group who received the Betahistine mesylate drug, the second group who received the Brandt-Daroff exercise and the third group who received the betahistine drug and the Brandt-Daroff exercise. In all three groups, the Dizziness Handicap Inventory (DHI) was assessed before and 1 week after the intervention. Statistical analysis using paired T test.

Result: From the three intervention groups, it was found that the mean age was 54.31 ± 12.41 years (group 1), 51.04 ± 9.02 years (group 2), and 55.15 ± 14.12 years (group 3). The majority of subjects were female, namely 44 people (56.4%). There was a significant difference in DHI values between before and after the intervention in group 1, namely DHI values 46.5 ± 14.9 and 24.9 ± 16.1 ; in group 2, the DHI values were 40.0 ± 12.6 and 28.2 ± 13.4 ; and in group 3, the DHI values were 64.9 ± 14.7 and 23.7 ± 12.3 ($p = 0.001$).

Conclusion: There was a significant difference in effect with the addition of Betahistine mesylate and Brandt-Daroff Exercise after the Epley Maneuver in the treatment of BPPV patients ($p = 0.001$).

Introduction

Benign Paroxysmal Positional Vertigo (BPPV) is a common disease in society, therefore it is often encountered especially in ENT and Neurology clinics, and the symptoms are very disturbing for patients. However, BPPV is a simple disease to diagnose and treat. The most frequently used physical maneuver is the Epley Maneuver.¹

In the research of Ugurlu et al (2012) concluded that no change in treatment success was observed when the Epley Maneuver was combined with other procedures. Theoretically, BPPV may disappear after repositioning of the otolithic debris to the utricle with the Epley Maneuver. 80% success is reported after one series of maneuvers, and will increase with repetition of these maneuvers. The meta-analysis of the Epley Maneuver, modified for the treatment of BPPV of the posterior canal, showed four times greater symptom improvement rates, and five times greater resolution of nystagmus than placebo.²

Brandt and Daroff exercises which are vestibular physical therapy, when combined with Betahistine was significantly more effective than just the Epley Maneuver ($p < 0.05$).³ Epley's maneuver alone or in combination with Betahistine or placebo was found to be very effective with 86.2% success. Symptoms were significantly reduced in the three groups as a whole and patients younger or older than age 50 who had hypertension with a symptom onset of 1 month and with an attack duration of less than one minute did significantly better with the combination of Betahistine 48 mg daily.⁴

The purpose of this research is know the different effects of adding Betahistine mesylate and Brandt-Daroff Exercise after the Epley Maneuver on the treatment of BPPV.



Method

This research is a true experimental study on a population of BPPV patients at RSUP H Adam Malik Medan which was taken consecutively from January to December 2019. The diagnosis of BPPV was made based on the Dix hallpike examination and after that treatment was carried out with the Epley Maneuver. The sample was further divided into three intervention groups, namely the first group who received 2x12 mg of Betahistine mesylate for 1 week, the second group who received Brandt-Daroff exercises 3 times a day for 1 week; and the third group who received 2x12 mg betahistine mesylate and Brandt-Daroff exercise 3 times a day for 1 week. In all three groups, the Dizziness Handicap Inventory (DHI) was assessed before and 1 week after the intervention. The DHI score ranges from 0-100, where a higher DHI score indicates a worse level of inhibition. Statistical analysis using paired T test.

Results

Table 1. Demographic Characteristics of Research Subjects

Characteristics	Group 1 (n = 26)	Group 2 (n = 26)	Group 3 (n = 26)
Age (years), mean \pm SD	54.3 \pm 12.4	51.0 \pm 9.0	55.2 \pm 14.1
Gender			
• Man	8 (30.8%)	11 (42.3%)	15 (57.7%)
• Women	18 (69.2%)	15 (57.7%)	11 (42.3%)
Profession			
• Civil servants	3 (11.5%)	11 (42.3%)	1 (3.8%)
• Entrepreneur	3 (11.5%)	3 (11.5%)	3 (11.5%)
• Employees	1 (3.8%)	0 (0%)	1 (3.8%)
• Farmer	1 (3.8%)	5 (19.2%)	11 (42.3%)
• Retired	4 (15.4%)	0 (0%)	4 (15.4%)
• Housewife	14 (53.8%)	7 (26.9%)	5 (19.2%)
Tribe			
• Batakese	18 (69.2%)	11 (42.3%)	13 (50.0%)
• Karonese	1 (3.8%)	6 (23.1%)	4 (15.4%)
• Malay	1 (3.8%)	1 (3.8%)	0 (0%)
• Aceh	3 (11.5%)	2 (7.7%)	8 (30.8%)
• Javanese	3 (11.5%)	6 (23.1%)	1 (3.8%)
Education			
• Primary School	2 (7.7%)	3 (11.5%)	2 (7.7%)
• Junior High	3 (11.5%)	3 (11.5%)	2 (7.7%)
• High school	15 (57.7%)	13 (50.0%)	16 (61.5%)
• D3	2 (7.7%)	3 (11.5%)	3 (11.5%)
• S1	4 (15.4%)	4 (15.4%)	3 (11.5%)

From table 1, it is found that the research subjects of BPPV patients are 78 samples, which are divided into three intervention groups, each of which consists of 26 samples. The age of the study subjects had a mean of 54.3 \pm 12.4 years in group 1, 51.0 \pm 9.0 years in group 2 and 55.2 \pm 14.1 years in group 3. The sex of research subjects was found to be 18 women (69.2%) and there were 8 men (30.8%) in group 1; 15 women (57.7%) and 11 men (42.3%) in group 2; 15 men (57.7%) and 11 women (42.3%) in group 3.



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The occupation of research subjects was found mostly as housewives, amounting to 14 people (53.8%) in group 1, civil servants (PNS) amounting to 11 people (42.3%) in group 2 and farmers amounting to 11 people (42.3 %) in group 3. The most tribal subjects of the study were the Batakese ethnic groups in all groups, namely 18 people (69.2%), 11 people (42.3%) and 13 people (50.0%).

Table 2. Effects of adding Betahistine mesylate after the Epley Maneuver in BPPV Patients (Group 1)

The Epley + Betahistine maneuver Mesylate	DHI Mean ± SD	P
• Before the Intervention	46.5 ± 14.9	0.001*
• After the intervention	24.9 ± 16.1	

* Wilcoxon test, $p < 0.05$

Table 2 shows the initial DHI value after the maneuver *Epley* 46.5 ± 14.9 and after receiving the addition of the drug Betahistine mesylate for 1 week, DHI was found to be 24.9 ± 16.1 and statistically significant differences in DHI values before and after the intervention ($p = 0.001$) were found.

Table 3. Effects of adding Brandt-Daroff Exercise after the Epley Maneuver in BPPV Patients (Group 2)

Epley Maneuver + Exercise Brandt-Daroff	DHI Mean ± SD	p
• Before the Intervention	40.0 ± 12.6	0.001*
• After the intervention	28.2 ± 13.4	

* Wilcoxon test, $p < 0.05$

Table 3 shows the initial DHI value after the maneuver *Epley* amounted to 40.0 ± 12.6 and after receiving the addition of Brandt-Daroff Exercise for 1 week, DHI values were improved to 28.2 ± 13.4 and statistically significant differences in DHI values before and after the intervention ($p = 0.001$).

Table 4. Betahistine Mesylate addition and Exercise effects Brandt-Daroff after the Epley Maneuver in BPPV Patients (Group 3)

Epley Maneuver + Betahistine mesylate + Brandt-Daroff Exercise	DHI Mean ± SD	p
• Before the Intervention	64.9 ± 14.7	0.001*
• After the intervention	23.7 ± 12.3	

* Wilcoxon test, $p < 0.05$

Table 4 shows the initial DHI value after the maneuver *Epley* 64.9 ± 14.7 and after receiving the addition of the drug Betahistine mesylate and Brandt-Daroff Exercise for 1 week, DHI values were improved to 23.7 ± 12.3 and statistically significant differences in DHI values before and after intervention ($p = 0.001$).

Discussion

In this study, from 78 research subjects, patients with BPPV were found to be more female, namely 44 people (56.4%) compared to men by 34 people (43.5%). This is in accordance with Indriawati's research and Pinzon (2017) in 20 patients with complaints of peripheral vertigo at a hospital in Yogyakarta that found 14 more women (70.0%) than 6 men (30.0%).⁵ According to the research of Rahul et al. (2016) found more women with peripheral



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vertigo by 75.0% compared to 25.0% men.⁶ Ugurlu et al. (2012) research on BPPV patients also found that 36 women (60.0%) compared to men by 24 people (40.0%).¹ The higher prevalence in women can be attributed to hormonal effects, where a decrease in estrogen levels can interfere with the internal structure of the otoconia or the interconnections that affect the gelatin matrix. Another possibility is that the increased concentration of calcium released in the endolymph results in an increase in calcium resorption, which may reduce the capacity to dissolve the released otoconia.²

The characteristics of the mean age of the research subjects in this study were almost the same as Indriawati's research and Pinzon (2017) where the mean age was 55.8 ± 13.7 years.⁵ Vijayaraj's research (2018) found the most age ranges from 60-89 years with a mean of 57 years.⁷ Cetin et al. (2018) research on BPPV patients was found mean age 56.4 ± 11.3 years.⁸ Research by Vyacheslavona et al. (2015) found that the mean age was 50.8 ± 13.3 years.⁹ Guneri and Kustutan's (2012) study found an average age of 53 ± 12 years.⁴ with the theory that BPPV can occur at any age including infants but the peak incidence occurs between the ages of 50 and 60 years. BPPV generally occurs spontaneously but can also be associated with the hypothesized occurrence of minor head trauma within 24-72 hours (domestic accidents, sports accidents, accidents at school, dental work, etc.), only to a lesser extent associated with viruses or vascular disease. Age is associated with degenerative changes that cause altered otoconia debris which floats freely and enters the semicircular canal causing BPPV.

In this research, there was found Significant differences in DHI values before and after intervention in the three groups, group 1 who received the addition of the drug Betahistine mesylate with $p = 0.001$, group 2 who received the addition of the Brandt-Daroff exercise with $p = 0.001$ and group 3 who received the addition of the drug Betahistine mesylate and Brandt-Daroff exercise for 1 week with $p = 0.001$.

Research by Moreno et al (2014) concluded that Maneuver Epley performed at the first visit of BPPV patients showed improvement in 76% of patients, and most patients showed improvement spontaneously after 1 month.¹⁰ Hilton and Pinder's (2014) study reported that vertigo resolution occurred significantly in the group treated with the Epley Maneuver compared with control (Odd Ratio 4.42 with 95% confidence interval 2.62-7.44).¹¹

Kaur and Shamanna's (2017) study found that the mean VAS value after treatment at the end of the first week between the Epley Maneuver group with Betahistine (2.33 ± 1.36) and the group that only received Betahistine (3.73 ± 1.96) and This difference was very significant ($p = 0.002$).¹² A study by Mira et al (2003) on 75 subjects who received Betahistine and 69 subjects who received placebo showed that Betahistine was more effective than placebo in terms of vertigo frequency, intensity, duration, improvement in symptoms and quality of life. Betahistine significantly reduced vertigo attacks, intensity scores and duration compared to placebo in both Meniere's disease and BPPV.¹³

Research by Mani et al (2019) found a decrease in complaints *dizziness* based on the pre and post test DHI score at the end of the third week in the BPPV group which was carried out by the Epley Maneuver and Brandt-Daroff Exercise.¹⁴ The study of Hanapi et al. (2018) concluded that the Epley Maneuver and Brandt-Daroff Exercise were equally effective in the management of posterior canal BPPV, where it was found. reduction in vertigo intensity and improvement in quality of daily life based on DHI scores.¹⁵ Meryana et al. (2011) found greater improvement in DHI scores on functional aspects in the group receiving the Epley Maneuver and Brandt-Daroff Exercise compared to the Epley Maneuver alone group ($p = 0.005$).¹⁶

Conclusion

There was a significant difference in effect with the addition of Betahistine mesylate and Brandt-Daroff exercise after the Epley Maneuver in the treatment of BPPV patients.

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