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COMPARISON OF RECURRENCE OF BENIGN PAROXYSMAL POSITIONAL VERTIGO WITH AND WITHOUT HYPERTENSION

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Abstract

Background: Benign paroxysmal positional vertigo (BPPV) is the most common vestibular disorder. Several studies have shown that comorbid hypertension can affect the prognosis of BPPV. This study aims to assess the comparison of BPPV patient recurrences with and without hypertension.

Method: This research is an analytical study with a cohort design. The research was conducted at the Neurology Polyclinic of RSUP Haji Adam Malik Medan for the period of October 1, 2019 to December 1, 2019. A total of 40 BPPV patients with and without hypertension were taken into the study sample, using consecutive sampling technique. For 7 days recurrence was recorded and on the 7th day, BPPV symptoms were reassessed with the Dix-Hallpike maneuver. Furthermore, statistical analysis was performed using the Mann Whitney U test and the Kruskal Wallis test.

Result: Of the 40 research subjects, there were 29 more women (72.5%) and the highest age was in the range >40 - 60 years as many as 23 subjects (57.5%). There were 18 people (90.0%) BPPV patients with hypertension and as many as 4 people (20.0%) BPPV patients without hypertension experienced recurrences, where one recurrence was found in 13 people (65.0%) and more than one recurrence. times or vertigo was felt continuously found in 5 people (25.0%) BPPV patients with hypertension ($p = 0.000$).

Conclusion: There is a significant difference in recurrence between BPPV patients with and without hypertension.

Introduction

Benign paroxysmal positional vertigo (BPPV) is the most common vertiginous disorder in society. Cardinal symptoms include sudden vertigo caused by a change in the position of the head, for example turning in bed, lying in bed, looking up, bending over or a sudden change in the position of the head. There are several broad spectrums of severity. Mild symptoms are inconsistent bouts of vertigo. Moderate symptoms include attacks of frequent frequency and with disequilibrium between attacks. To a severe degree, vertigo is provoked by a large proportion of head movements, giving the impression of persistent vertigo. Symptoms can last for days, weeks, months, years, or recur for years.¹

A multicentre observational study by De Stefano et al (2014) examined the epidemiology of BPPV associated with comorbidities. This study aims to find a statistical relationship between comorbid diseases (hypertension, diabetes mellitus, osteoarthritis, osteoporosis and depression) that affect the elderly population with BPPV recurrence. The results of the study showed that there was a statistically significant difference between the number of comorbid diseases and the number of recurrences, the more comorbid diseases, the greater the recurrences that occurred.² Marchiori et al. (2010) studied the comparison of the frequency of vertigo in the elderly population with and without hypertension, found that the frequency of vertigo was equally high between the two populations. This study has not been able to determine the mechanism that explains the relationship between BPPV and hypertension in the elderly population.³

Tan et al (2016) conducted a study to assess the relationship between BPPV and comorbid hypertension. There were no significant differences in age, sex ratio, or side of illness between patients with comorbid hypertension and without comorbid hypertension. The proportion of patients reporting an initial episode of positional vertigo was significantly lower in the comorbid hypertensive group (51.22% versus 74.47%; $p = 0.024$). Patients with comorbid hypertension reported a longer duration of BPPV episodes compared with those without comorbid hypertension (60 days compared with 15 days; $p = 0.017$). Management with the repositioning maneuver showed similar results between the two groups. At follow-up, there was recurrence of BPPV in 13 patients with comorbid hypertension and in 6 patients without comorbid hypertension ($p = 0.031$). The investigators concluded that hypertension significantly affected the prognosis of BPPV.⁴



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The purpose of this research is to find out comparison of recurrences of benign paroxysmal positional vertigo (BPPV) patients with and without hypertension.

Research methods

This research is an analytical study with a cohort design. The study was conducted at the Neurology Polyclinic of RSUP Haji Adam Malik Medan for the period of 1 October 2019 to 1 December 2019. A total of 40 BPPV patients with hypertension and idiopathic BPPV were taken as the study sample, using consecutive sampling technique. The diagnosis is made based on history, physical examination and the Dix-Hallpike maneuver. Then the Epley maneuver was performed as management of BPPV. For 7 days recurrence was recorded and on the 7th day, clinical symptoms of BPPV were reassessed with the Dix – Hallpike maneuver. Furthermore, statistical analysis was performed using the Mann Whitney U test and the Kruskal Wallis test.

Results

Of the 40 study subjects analyzed, it was found that 29 more women (72.5%) than 11 men (27.5%). Most ages were in the range >40 - 60 years as many as 23 subjects (57.5%). It was found that the highest ethnic group was Batakese with 16 people (40.0%), the highest level of education was Senior High School 20 people (50.0%), with the most occupations being a housewife 16 people (40.0%). In clinical criteria, the most BPPV lesions were found on the right side of 18 people (45.0%), followed by the left side of 17 people (42.5%) and on both sides as many as 5 people (12.5%). The characteristics of the research sample can be seen in Table 1.

Table 1. Characteristics research subject

Characteristics	n = 40	Benign paroxysmal positional vertigo	
		Hypertension (+) (n = 20)	Hypertension (-) (n = 20)
Gender			
Male	11 (27.5%)	5 (25.0%)	6 (30.0%)
Women	29 (72.5%)	15 (75.0%)	14 (70.0%)
Age			
≥18 - 40 years	7 (17.5%)	7 (35.0%)	-
> 40 - 60 years	23 (57.5%)	8 (40.0%)	15 (75.0%)
> 60 years	10 (25.0%)	5 (25.0%)	5 (25.0%)
Tribe			
Aceh	4 (10.0%)	1 (5.0%)	3 (15.0%)
Batakese	16 (40.0%)	9 (45.0%)	7 (35.0%)
Javanese	4 (10.0%)	2 (10.0%)	2 (10.0%)
Karonese	5 (12.5%)	2 (10.0%)	3 (15.0%)
Mandailing	8 (20.0%)	4 (20.0%)	4 (20.0%)
Malay	3 (7.5%)	2 (10.0%)	1 (5.0%)
Education			
Primary High	3 (7.5%)	2 (10.0%)	1 (5.0%)
Junior High	8 (20.0%)	3 (15.0%)	5 (25.0%)
High school	20 (50.0%)	9 (45.0%)	11 (55.0%)
College	9 (22.5%)	6 (30.0%)	3 (15.0%)
Profession			
Housewife	16 (40.0%)	8 (40.0%)	8 (40.0%)
Civil servants	9 (22.5%)	5 (25.0%)	4 (20.0%)
entrepreneur	15 (37.5%)	7 (35.0%)	8 (40.0%)
Location of lesions			
Right	18 (45.0%)	9 (45.0%)	9 (45.0%)
Left	17 (42.5%)	9 (45.0%)	8 (40.0%)
Both	5 (12.5%)	2 (10.0%)	3 (15.0%)

In table 2, we can see the comparison of BPPV patient recurrences with and without hypertension. There were 18 patients with BPPV (45.0%) without experiencing recurrences, where 16 people (80.0%) were BPPV patients



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without hypertension and 2 people (10.0%) were BPPV patients with hypertension. It was found that 22 BPPV patients (55.0%) experienced recurrences, where 18 people (90.0%) BPPV patients with hypertension and 4 people (20.0%) BPPV patients without hypertension. One-time recurrence was found in 13 people (65.0%) and recurrence more than once or vertigo was felt continuously for 7 days in 5 people (25.0%) BPPV patients with hypertension. Significantly, there were more BPPV patients with hypertension who experienced recurrences (within 7 days) than BPPV patients without hypertension ($p = 0.000$).

Table 2. Comparison of recurrences of BPPV patients with and without hypertension

		Benign paroxysmal positional vertigo				p
		Hypertension (+)		Hypertension (-)		
		n	%	n	%	
Recurrence	There is no	2	10.0	16	80.0	0,000 *
	One time	13	65.0	3	15.0	
	More than once or continuously	5	25.0	1	5.0	
Total		20	50.0	20	50.0	

*Kruskall Wallis test

Discussion

In this study, 40 subjects were found, with 11 male (27.5%) and 29 female (72.5%). This is in accordance with a study by Wang et al (2014) on 726 subjects with complaints of vertigo and balance disorders, there were 209 people (28.8%) with a diagnosis of BPPV consisting of 58 men (27.7%) and 151 women. people (72.2%).⁵ In the retrospective analysis by Ogun et al (2014) of 1360 subjects with BPPV, it was found that 437 male subjects (32.1%) and 923 women (67.9%).⁶ Several other studies by Byun et al (2019), De Stefano et al (2014) and von Brevern et al (2007) also found that the incidence and prevalence of BPPV is higher in women than men.^{2,7,8}

In this study, it was found that the age of the most subjects was in the range >40 - 60 years, totaling 23 subjects (57.5%). This is in accordance with research by Yetiser and Ince (2015) concerning the demographic analysis of BPPV which found that BPPV generally occurs in the middle age group, namely in the 31-50 years age range.⁹ Tan et al (2016) conducted research on clinical characteristics and clinical outcomes in BPPV with comorbid hypertension and looking for differences with idiopathic BPPV in 41 BPPV subjects with comorbid hypertension and 47 subjects with idiopathic BPPV. In this study, it was found that the mean age of the BPPV sample with comorbid hypertension was 53.44 ± 9.78 and the mean age of the idiopathic BPPV sample was 51.64 ± 12.21 .⁴

In this study, it was found that the majority of subjects as many as 22 people (55.0%) experienced recurrences. This is in accordance with research by De Stefano et al (2014) on 1092 subjects with BPPV, it was found that 50.5% of subjects experienced recurrence once.² Likewise in research by Luryi et al (2018) on 1,105 subjects with BPPV it was found that the majority Research subjects at 65.0% experienced recurrences.¹⁰

In this study, there was a significant difference in recurrence between BPPV patients with and without hypertension. This is in accordance with the study by Tan et al (2016) which evaluated the clinical characteristics and clinical outcomes of BPPV with comorbid hypertension and its differences compared to idiopathic BPPV, based on recurrence there was a significant difference between the BPPV group with comorbid hypertension compared to idiopathic BPPV, with p value = 0.031.⁴ This is in accordance with a study by Zhu et al. (2019) who conducted a retrospective observational study regarding clinical characteristics and risk factors for BPPV recurrence in 1012 subjects with a diagnosis of BPPV, clinical outcomes or therapeutic success were assessed based on recurrence, so it was found that BPPV recurrence was significantly associated with comorbidities. hypertension with a value of $p = 0.002$.¹¹ Likewise in research by De Stefano et al (2014) and Picciotti et al (2016) which examined the comparison of BPPV recurrences based on comorbid diseases, there was a significant difference between the rates of recurrence based on the number of comorbidities experienced by subjects with BPPV.^{2,12}



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BPPV recurrence has been the focus of many studies, especially in relation to various repositioning maneuvers. The etiology of BPPV is generally assumed to involve the release of otoconia. There are two reasons that can explain recurrence, namely the freed otoconia particles can reflux into the semicircular canal after repositioning maneuvers or newly released otolith debris enters the semicircular canal. Otoconia can be damaged by drugs, inflammation, trauma and most importantly, age-related decalcification. The vestibular system will degenerate with age and as a result of changes caused by hypertension. Hypertension causes diffuse vascular damage and atherosclerosis. The occlusion of the anterior vestibular artery will cause a sudden vertigo crisis (Lindsay-Hemenway syndrome) which is considered otolithic disease. Blood vessel damage to the inner ear caused by atherosclerosis can result in the progressive release of otoconia from the otolithic membrane.^{2,4}

Conclusion

There was a significant difference in recurrence between BPPV patients with and without hypertension, where it was found that more BPPV patients with hypertension experienced recurrences (within 7 days) than BPPV patients without hypertension.

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