KBB ve BBC Dergisi 22 (2):35-9, 2014

Evaluation of Dizziness Handicap Inventory Subgroup Scores of the Patients with Benign Paroxysmal Positional Vertigo

Benign Paroksismal Pozisyonel Vertigolu Hastalarda Dizziness Handikap Envanteri Alt Grup Skorlarının Değerlendirilmesi

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ABSTRACT

Objective: The aim of the study is to evaluate the difference between Dizziness Handicap Inventory (DHI) functional, physical, emotional subgroup scores for patients that were diagnosed as Benign Paroxysmal Positional Vertigo (BPPV) with Dix-Hallpike maneuver.
Material and Methods: The 51 patients admitted to hospital with a complaint of vertigo,were diagnosed as BPPV with Dix-Hallpike maneuver and for whom a dizziness handicap inventory was filled out, were included in the study. Dizziness Handicap Inventory physical, functional, emotional subgroup total scores were evaluated and investigated statistically regarding diffferences between 3 subgroups.
Results: In the evaluation of DHI total score, the majority of the patients in our study group were determined as belonging to the severely handicapped group. When total scores of subgroups were compared, statistically significant difference was not determined between the total scores of physical and functional subgroups. Emotional subgroup score was significantly different from scores of the two other aforementioned groups.
Conclusion: BPPV is the most common cause of vertigo in the world. Those patients that are suspected of having BPPV and whom Dix-Hallpike maneuver can not be performed for various reasons, Dizziness handicap inventory physical and functional subgroup scores should be evaluated rather than emotional subgroup score.

Keywords
Dizziness; benign paroxysmal positional vertigo; dizziness handicap inventory

ÖZET

Amaç: Çalışmanın amacı Dix-Hallpike testi ile Benign Paroksismal Pozisyonel Vertigo tanısı konulan hastalarda Dizziness Handikap Envanteri (DHE) anketinin psikolojik, fonksiyonel, fiziksel alt grup skorlarının birbirleri ile ilişkisinin incelenmesidir.
Gereç ve Yöntemler: Baş dönmesi şikayeti ile KBB polikliniğine başvuran, Dix-Hallpike testi ile BPPV tanısı konulan ve dizziness handikap envanteri ile değerlendirilen 30 kadın ve 21 erkek olmak üzere toplam 51 hasta çalışmaya dahil edildi. Hastaların dizziness handikap envanteri fiziksel, fonksiyonel ve emosyonel alt grup total skorları karşılaştırılarak 3 grup arasında istatistiksel olarak anlamlı fark olup olmadığı değerlendirildi.
Bulgular: DHE total skorları değerlendirildiğinde çalışma grubumuzdaki hastaların çoğunluğunun ciddi grupta (grup 4) yer aldığı belirlendi. Alt grup total skorları birbirleri ile karşılaştırıldığında fiziksel ve fonksiyonel alt grupların toplam skorları arasında istatistiksel olarak anlamlı fark tespit edilmedi. Emosyonel alt grup skorları diğer iki gruptan istatistiksel olarak anlamlı derecede farklıydı.
Sonuç: BPPV tüm dünyada vertigonun en sık sebebidir. BPPV düşünülen ve çeşitli nedenlerle Dix-Hallpike testi yapılamayan hastaların dizziness handikap envanteri anketinde emosyonel gruptan ziyade fiziksel ve fonksiyonel alt grup skorları değerlendirilmelidir.

Anahtar Sözcükler
Baş dönmesi; benign paroksismal pozisyonel vertigo; dizziness handikap envanteri

Çalışmanın Dergiye Ulaştığı Tarih: **02.02.2014** Çalışmanın Basıma Kabul Edildiği Tarih: **18.06.2014**

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INTRODUCTION

Benign paroxysmal positional vertigo (BPPV) is one of the most common vestibular disorders with a safe and highly effective treatment.[1] In the general population, the lifetime prevalence of BPPV is 2.4%, and the 1-year incidence is 0.6%.[2] BPPV is characterized by the symptom of rotating dizziness that is caused by sudden changes in the position of the head. Other accompanying symptoms are nausea, vomiting and positioning nystagmus.[3] BPPV pathophysiology is associated with the shifting of utricular statocone debris in a disorganized fashion towards the semicircular canals (SCCs).[4] Canalithiasis of the posterior SCC is the most frequent cause of BPPV, but lateral and anterior canals can also be involved.[5,6] The diagnosis of BPPV is made by observing the classic eye movements in association with the Dix-Hallpike maneuver, combined with a suggestive history.[5] Dix-Hallpike test is the ''gold standard'' to determine BPPV.[7]

Individuals presenting with BPPV do not always demonstrate the typical complaint of vertigo.[8] Norre suggested that it may be necessary to examine the patient more than one time for the diagnosis to be confirmed with the Dix-Hallpike test, signifying that the diagnosis is not always easily confirmed during the clinical examination.[9] So some patients need to be evaluating more than once.

The Dizziness Handicap Inventory (DHI) was developed to measure the self-perceived level of handicap associated with the symptom of dizziness. The DHI has 25 items with 3 response levels, subgrouped into three domains: functional, emotional, and physical.[10] Items within the DHI may be helpful in making the diagnosis of BPPV because the DHI contains important questions that may lead the clinician to suspect that the patient has BPPV.[8] Some of research variations of DHI were evaluated for BPPV individuals and short forms of DHI were recomended.[1,8]

The purpose of the present study is to evaluate the subgroups of DHI in patients with BPPV. We tried to figure out differences between functional, emotional, and physical subgroups of DHI for in patients with BPPV.

MATERIAL AND METHODS

A prospective study including 51 consecutive outpatients with BPPV (30 women and 21 men) was carried out between November 2012 and March 2013. The diagnosis of BPPV was made on the basis of the history of short episodes of vertigo in association with rapid changes in head position and confirmed by Dix-Hallpike Maneuver. A DHI was filled out for all 51 patients participating in the study. A neuro-otologic examination was conducted at the initial visit, and written information concerning the purpose of the study and its confidentiality was given to patients. Informed consent was obtained for all subjects to their inclusion in the study. Ataturk University Ethical and Research Committees approved the research protocol.

DIZZINESS HANDICAP INVENTORY

The Dizziness Handicap Inventory (DHI) is a 25-item scale that was designed to evaluate the effect of dizziness. In the DHI, respondents choose one of three statements that most applies to them in each section. The first statement is scored 0, the second is scored 2, and the third is scored 4. The sum of the scores is the total score. Possible score ranges are 0-100; a higher score indicates a bad handicap. Score ranges are considered normal (Group 1) between 0-14 points, mild (Group 2) between 16-26 points, moderate (Group 3) between 28-44 and severe (Group 4) when 46 points or greater. DHI questions are separated into three parts: functional, emotional and physical (Table 1).[10] In our study, we evaluated DHI total scores and functional, emotional and physical subgroup scores. We studied the differences between three subgroup scores.

DATA ANALYSIS

All data analyses were performed using Statistical Package for Social Sciences (SPSS), version 10.1, software (SPSS, Inc., Chicago, IL, U.S.A.). A Type I error rate of $p \leq 0.05$ for statistical significance was used. Differences in DHI subgroup scores between patients were assessed with Analysis of variance (ANNOVA) test. Kolmogrov-Smirnov test was performed for detecting whether each group was normally distributed or not. DHI subgroups showed normal distribution. Also homogeneity of group variances was tested before ANNOVA test. The variances were not homogeneous for a 5% ($p \leq 0.05$) significance level. The difference between the three groups was observed with Brown-Forsythe and Welch tests.

RESULTS

There were 31 females (58.8%) and 20 males (41.2%) among 51 patients in total. The ages of the pa-

Table 1. Dizzines Handicap Inventory.

	Yes	No	Sometimes
1. Does looking up increase your problem? (p)			
2. Because of your problem, do you feel frustrated? (e)			
3. Because of your problem, do you restrict your travel for business or recreation? (f)			
4. Does walking down the aisle of a supermarket increase your problem? (p)			
5. Because of your problem, do you have difficulty getting into or out of bed? (f)			
6. Does your problem significantly restrict your participation in social activities such as going out to dinner, going to movies, dancing, or to parties? (f)			
7. Because of your problem, do you have difficulty reading? (f)			
8. Does performing more ambitious activities like sports, dancing, household chores such as sweeping or putting dishes away increase your problem? (p)			
9. Because of your problem, are you afraid to leave your home without having someone accompany you? (e)			
10. Because of your problem, have you been embarrassed in front of others? (e)			
11. Do quick movements of your head increase your problem? (p)			
12. Because of your problem, do you avoid heights? (f)			
13. Does turning over in bed increase your problem? (p)			
14. Because of your problem, is it difficult for you to do strenuous housework or yard work? (f)			
15. Because of your problem, are you afraid people may think you are intoxicated? (e)			
16. Because of your problem, is it difficult for you to walk by yourself? (f)			
17. Does walking down a sidewalk increase your problem? (p)			
18. Because of your problem, is it difficult for you to concentrate? (e)			
19. Because of your problem, is it difficult for you to walk around your house in the dark? (f)			
20. Because of your problem, are you afraid to stay home alone? (e)			
21. Because of your problem, do you feel handicapped? (e)			
22. Has your problem placed stress on your relationships with members of your family or friends? (e)			
23. Because of your problem, are you depressed? (e)			
24. Does your problem interfere with your job or household responsibilities? (f)			
25. Does bending over increase your problem? (p)			

p: Physical; e: Emotional; f: Functional.

tients ranged between 23-77 years with a mean of 48,8±13,85. The ages of females ranged between 27-77 years with a mean of 48,4±14,23, men's ages ranged between 23-73 years with a mean of 49,2±13,54. All of the participants had idiopathic or primary BPPV of the posterior SSC, four of whom presented with BPPV after head trauma. All of the participants had unilateral posterior canal BPPV, 34 (66.6%) on the left side and 17 (33.4%) on the right side. The majority had history of a single distinct episode of an acute onset of vertigo, nausea, and emesis lasting days to weeks.

Fifty one individuals completed DHI in the first meeting. DHI scores of 51 participating patients were calculated. The scores of the individuals were between 14-90. The mean score of the DHI was 52,8. Classification of the patients according to DHI severity yielded the following findings: 1(1,9%) patient in Group 1, 8 (15,7%) in Group 2, 13 (25,5%) in Group 3 and 28 (56,9%) in Group 4. There were significant differences between group 4 and other groups.

The scores of physical, functional, and emotional subgroups were calculated. The physical subgroup scores were between 0-28 with a mean of 18,1. The functional subgroup scores were between 0-32 with a mean of 17,5. The emotional subgroup scores were between 0-36 with a mean of 18,1. There were significant differences between emotional and other two subgroups (physical and functional). The emotional subgroup scores were lower than functional and physical subgroup scores ($p<0.05$) (Table 2).

Table 2. Comparison scores of DHI subcales (physical, functional, emotional).

		Mean Difference	Std. Error	Sig.
Physical	Emotional	3,61	1,47	**0,05***
	Functional	-1,22	1,7	0,86
Emotional	Physical	-3,61	1,47	**0,05***
	Functional	-4,82	1,74	**0,02***
Functional	Physical	1,22	1,7	0,86
	Emotional	4,82*	1,75	**0,02***

* Mean difference is significant at 0.05.
Sig.: Significant; Std. Error: Standard error.

DISCUSSION

Benign paroxysmal positional vertigo is one of the most frequent vestibular diseases in older people, and the posterior canal is affected in the majority of cases.[11] The age of the population studied varied between 23-77 years, with a mean value of 48.8 years. Our population was younger than in other studies.[11,12]

In our study, all of the participants had unilateral posterior canal BPPV, 34 (66.6%) on the left side and 17 (33.4%) on the right side. These results were similar to previous studies.[12,13]

Some patients experience difficulty in moving into the Dix-Hallpike test position, including those who are morbidly obese, patients having a stroke, patients with severe anxiety, patients who are extremely frail, and patients who have significant neck pain or limited mobility. The chair commonly used by an otolaryngologist can cause difficulty in performing the test when sitting in an ENT unit chair, due to special conditions of some patients. The results of the DHI may lead the physician to have a high level of suspicion for BPPV; one could then set up the clinical environment differently to allow more feasible Dix-Hallpike testing.[8] In our population we calculated total score of DHI and the mean score of the DHI was 52.8. We obtained similar scores to the recent researches.[8,13] Whitney et al. did not find significant differences between DHI scores of BPPV and other vestibular disorders.[8]

DHI is a common tool used to assess individual's dizziness handicap.[14] Most individuals with a positive finding on Dix-Hallpike testing express a symptom of some type, although it does not always resemble their original complaint of vertigo.[7] In older individuals, it may be especially important to make an accurate and timely diagnosis of BPPV. Whitney et al. defined a DHI subscale for BPPV.[8] In their study DHI subgroup scores were significant with patients diagnosed as having BPPV.[8] We decided to evaluate differences between DHI subgroup scores for BPPV. Emotional subgroup score was significantly different from physical and functional subgroup scores. Functional and physical subgroup scores should be emphasized for assessing the DHI. Questions of emotional subgroup evaluate complaints of patients such as anxiety, namely a fear of an approaching dizziness. BPPV usually is an acute disease. Therefore, patients diagnosed as suffering from BPPV have significantly higher scores in functional and physical subgroups. The physical and functional conditions of patients are more affected than their emotional conditions. In their study, Whitney et al. found emotional and functional subgroup scores higher in BPPV than in non-BPPV patients.[8] They did not find any differences between subgroup scores.[8]

In our study functional and physical subgroup scores are found significantly higher than the emotional subgroup score. We think DHI functional and physical subgroup scores may be used in patients with BPPV to whom Dix-Hallpike maneuver cannot be applied because of various reasons.

REFERENCES

1. Lopez-Escamez JA, Gamiz MJ, Fernandez-Perez A, Gomez-Fiñana M. Long-term outcome and health-related quality of life in benign paroxysmal positional vertigo. Eur Arch Otorhinolaryngol 2005;262(6):507-11.
2. Helminski JO, Zee DS, Janssen I, Hain TC. Effectiveness of particle repositioning maneuvers in the treatment of benign paroxysmal positional vertigo: a systematic review. Phys Ther 2010;90(5):663-78.
3. Pereira AB, Santos JN, Volpe FM. Effect of Epley's maneuver on the quality of life of paroxismal positional benign vertigo patients. Braz J Otorhinolaryngol 2010;76(6):704-8.
4. Kasse CA, Santana GG, Scharlach RC, Gazzola JM, Branco FC, Doná F. Results from the balance rehabilitation unit in benign paroxysmal positional vertigo. Braz J Otorhinolaryngol 2010;76(5):623-9.
5. Crane BT, Schessel DA, Nedzelski J, Minor LB. Peripheral vestibular disorders. In: Flint FW, Haughey BH, Lund VJ, Niparko JK, Richardson MA, et al., eds. Cummings Otolaryngology Head & Neck Surgery. 5th ed. Philadelphia: Mosby Elsevier; 2010. p.2328-45.
6. Korres S, Balatsouras DG, Kaberos A, Economou C, Kandiloros D, Ferekidis E. Occurrence of semicircular canal involvement in benign paroxysmal positional vertigo. Otol Neurotol 2002;23(6):926-32.
7. 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(5):647-52.
8. Whitney SL, Marchetti GF, Morris LO. Usefulness of the dizziness handicap inventory in the screening for benign paroxysmal positional vertigo. Otol Neurotol 2005;26(5): 1027-33.
9. Norre ME. Diagnostic problems in patients with benign paroxysmal positional vertigo. Laryngoscope 1994;104(11 Pt 1):1385-8.
10. Jacobson GP, Newman CW. The development of the Dizziness Handicap Inventory. Arch Otolaryngol Head Neck Surg 1990;116(4):424-7.
11. Cohen HS, Sangi-Haghpeykar H. Canalith repositioning variations for benign paroxysmal positional vertigo. Otolaryngol Head Neck Surg 2010;143(3):405-12.
12. André AP, Moriguti JC, Moreno NS. Conduct after Epley's maneuver in elderly with posterior canal BPPV in the posterior canal. Braz J Otorhinolaryngol 2010;76(3):300-5.
13. Durmus B, Fırat Y, Yıldırım T, Kalcıoglu T, Altay T. The Efficacy of Semont and modified Epley maneuvers in benign paroxysmal positional vertigo and preventative effect of Brandt-Daroff exercises on recurrence. Fırat Tıp Dergisi 2010, 15(3):131-6.
14. Cowand JL, Wrisley DM, Walker M, Strasnick B, Jacobson JT. Efficacy of vestibular rehabilitation. Otolaryngol Head Neck Surg 1998;118(1):49-54.