

Comparison of quality of life in patients with benign paroxysmal positional vertigo and meniere's disease

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ABSTRACT

Aim: The aim of this study is to compare the effect of vertigo symptom on quality of life in patients with Benign Paroxysmal Positional Vertigo and Meniere's Disease.

Method: The study included 66 volunteers aged 18–60 years who were diagnosed with Benign Paroxysmal Positional Vertigo or Meniere's Disease as a result of the evaluation together with the Audiology Unit between January 2022 and April 2022. A Patient Demographic Data Form, the European Vertigo Rating Scale (EVRS), and the World Health Organization Quality of Life Scale Short Form (WHOQOL-BREF) were administered to the individuals by the researcher.

Results: A statistically significant difference was found between the groups according to the variables of hearing loss, tinnitus, feeling of fullness, headache, sensitivity to light, and sensitivity to noise, EVRS score and "health satisfaction" and "physical health" scores, which are sub-dimensions of the WHOQOL-BREF scale.

Conclusion: The quality of life of individuals is affected in Benign Paroxysmal Positional Vertigo and Meniere's Disease. Due to the episodic course of Meniere's Disease, it is seen that the quality of life is more affected in patients with Benign Paroxysmal Positional Vertigo.

Keywords: benign paroxysmal positional vertigo, meniere's disease, vertigo, life quality, european vertigo rating scale

ÖZ

Benign paroksizmal pozisyonel vertigo ve meniere hastalığı olan hastalarda yaşam kalitesinin karşılaştırılması

Amaç: Bu çalışmanın amacı vertigo semptomunun yaşam kalitesine olan etkisini Benign Paroksizmal Pozisyonel Vertigo ve Meniere hastalarında karşılaştırmaktır.

Yöntem: Çalışmaya Ocak 2022-Nisan 2022 tarihleri arasında Odyoloji Birimi ile birlikte yapılan değerlendirme sonucunda Benign Paroksizmal Pozisyonel Vertigo veya Meniere Hastalığı tanısı konulan 18–60 yaş arası 66 gönüllü dâhil edildi. Hasta Demografik Veri Formu, Avrupa Vertigo Değerlendirme Skalası (AVS), Dünya Sağlık Örgütü Yaşam Kalitesi Ölçeği Kısa Formu (WHOQOL-BREF) araştırmacı tarafından bireylere uygulandı.

Bulgular: İşitme kaybı, kulak çınlaması, dolgunluk hissi, baş ağrısı, ışığa duyarlılık, sese duyarlılık, AVS puanı ve WHOQOL-BREF ölçeğinin alt boyutları olan "sağlık memnuniyeti" ve "bedensel sağlık" puanları değişkenlerine göre gruplar arasında istatistiksel olarak anlamlı fark bulundu.

Sonuç: Benign Paroksizmal Pozisyonel Vertigo ve Meniere Hastalığında bireylerin yaşam kaliteleri etkilenmektedir. Meniere Hastalığının epizodik seyri nedeniyle Benign Paroksizmal Pozisyonel Vertigolu hastalarda yaşam kalitesinin daha fazla etkilendiği görülmektedir.

Keywords: benign paroksizmal pozisyonel vertigo, meniere hastalığı, vertigo, yaşam kalitesi, avrupa vertigo değerlendirme skalası

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INTRODUCTION

Quality of life is defined as an individual's perception of their health status and psychological, cultural, social, and economic status in life (Szabo, 2003). Any situation that individuals experience in themselves or their environment may affect the quality of life. Vertigo and dizziness are symptoms frequently complained by adults (Neuhauser, 2016). These symptoms, with a lifetime prevalence of 20%-30%, affect the quality of life negatively and cause daily activity restrictions (Benecke, Agus, Kuessner, Goodall, & Strupp, 2013). In addition, vertigo and

dizziness are among the most important symptoms that cause falls (Casani et al., 2019). This is very important because accidents due to falling can cause injuries and even death (Bhattacharyya et al., 2008). Psychological disorders such as anxiety and depression can also be seen in individuals who have fear of falling due to dizziness. As a result of all these situations, it is reported that dizziness and vertigo affect the quality of life of individuals (Petri, Chirilă, Bolboacă, & Cosgarea, 2017, Green Jr, Verrall, & Gates, 2007, Handa, Kuhn, Cunha, Schafflein, & Ganança, 2005).

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There may be more than one etiology of vertigo and dizziness, but it is seen that it is more commonly caused by peripheral vestibular pathologies in clinics (Ahearn, & Umapathy, 2015). The most common peripheral vestibular system diseases that cause vertigo and dizziness are Benign Paroxysmal Positional Vertigo (BPPV) and Meniere's Disease (MD) (Gança MM, Munhoz MSL, Silva MLG, 2000). Benign paroxysmal positional vertigo is a disease characterized by sudden onset short-term dizziness and positional nystagmus triggered by rapid head movements, which occurs when otoconia leaving the utricle fall into the semicircular canals (Kim, & Zee, 2014). Its incidence is higher in women than in men, and its incidence increases with increasing age (Von Brevern, Radtke, Lezius, Feldmann, Ziese, Lempert, & Neuhauser, 2007). Because BPPV causes dizziness triggered by rapid head movements, it negatively affects daily living activities and reduces quality of life (You, Instrum, & Parnes, 2019). Meniere's disease is a disease characterized by fluctuating hearing loss, aural fullness, and tinnitus symptoms in the ipsilateral ear in addition to episodic vertigo (da Costa, de Sousa, & de Toledo Piza, 2002). While the symptoms that occur in attacks can last for minutes or hours, there is an asymptomatic period between attacks. The incidence of MD is higher in women than in men, and it is more common especially between the ages of 40 and 60 (Harris, & Alexander, 2010, Havia, Kentala, & Pyykkö, 2005). The emergence of the disease in attacks and the severe dizziness that lasts for hours during the attack adversely affect the quality of life (Handa et al., 2005). Vertigo and dizziness greatly affect the quality of life with the anxiety, stress, inactivity, limitation of daily living activities and social isolation that it brings. The prognosis of BPPV and MD, the two most common vestibular system diseases encountered in clinics, has different prognoses. In BPPV, attacks are triggered by head movement and last for a very short time, and the disease is relieved with a repositioning maneuver. In MD, it is not clear when the attacks will occur and the vertigo and dizziness last longer during the attack. The treatment of MD is more complex and takes longer than that of BPPV (Mohseni-Dargah et al., 2023). As a result of all these situations, it is a matter of curiosity to what extent the two diseases frequently encountered in clinics affect people's quality of life and whether there is a difference between them.

The aim of our study was to investigate the effect of vertigo symptom on quality of life in patients with BPPV or MD. The hypothesis of our study is that BPPV affects patients' quality of life more than Meniere's and does not.

METHOD

Research Design

In this study, a complementary cross-sectional study design was used to obtain information about the effect of vertigo on quality of life in BPPV and MD patients.

Participants

The population of the study consisted of 18–60 years old volunteers diagnosed with BPPV or MD based on the Ear Nose and Throat Polyclinic and Audiology Unit evaluations, with no communication disability, cognitive problem, pre-existing balance problem, congenital hearing loss, or a pathology affecting middle ear functions. Hearing was evaluated with pure tone audiometry test. Middle ear functions were evaluated with acoustic immittance test. The diagnosis of BPPV and Meniere was made according to the criteria published in 2015 by the Bárány Society Committee on the Classification of Vestibular Disorders and Videonystagmography device (Lopez-Escamez et al, 2015; Von Brevern, Bertholon, Brandt, Fife, Imai, Nuti, & Newman-Toker, 2015). According to the calculation made using the G*power 3.1 program, the sample size of the study was determined as 60, 30 for each group, with an effect size of 0.77, the margin of error of 0.05, the confidence level of 0.95, and the power to represent the population of 0.90 (Faul, Erdfelder, Buchner, & Lang, 2009). The study was completed with a total of 66 individuals, including 35 patients diagnosed with BPPV for the first time and 31 patients with MD in between attacks phase, who met the criteria for inclusion in the study and agreed to participate.

Data collection

The study was conducted prospectively in the Audiology Unit of the Ear, Nose and Throat Polyclinic of a local university between January 2022 and April 2022. A simple random sampling method, one of the probability sampling methods, was used to determine the participants. A Patient Demographic Data Form, the European Vertigo Rating Scale (EVRS), and the World Health Organization Quality of Life Scale Short Form (WHOQOL-BREF) were administered to the individuals participating in the study by the researcher. In some of the patients, the scales were applied via telephone.

Data collection tools

European Vertigo Rating Scale (EVRS): It is a 5-item questionnaire evaluating the character, duration, and symptoms of vertigo, such as nausea and vomiting, in patients with dizziness or vertigo. According to the answers given by the patients, points from 0 to 4 are given and the total score is calculated. A high score, with the highest score being 20, indicates that the patient's complaints are intense (Mègnigbèto, Sauvage, & Launois, 2001).

World Health Organization Quality of Life Scale Short Form (WHOQOL-BREF): The WHOQOL-BREF is a 26-item scale consisting of two subdomains as "general quality of life" and "satisfaction with health", and subscales "general health status", "physical health", "psychological health", "social relations", and "environment". It was created by shortening the WHOQOL-100, which consists of 100 items. The answer to each question is scored from 1 to 5. A high score indicates that the patient's quality of life is at a good level (The WHOQOL Group, 1998).

Statistical Analysis

Analysis of the research data was carried out with the IBM Statistical Package for Social Sciences (SPSS) program version 25 (Statistical Program in Social Sciences). Whether the data conformed to the normal distribution was checked with the Kolmogorov-Smirnov Test (Alpar, 2016). The significance level (p) was taken as ≤0.05 for the comparison tests. Since the variables did not have a normal distribution (p>0.05), the analysis was made with non-parametric test methods. In the independent pairwise comparisons, the Mann-Whitney U test was used because the assumption of normality was not provided. In the analysis of categorical data, cross-tables were created and the Chi-square (χ²) analysis was performed. Since WHOQOL-BREF sub-dimensions and EVRS values showed normal distribution, the Pearson correlation analysis was performed to model the relationship between them.

The Cronbach α coefficient was used to determine the reliability analysis of the scales used. Explanation of the relationships between a dependent variable and an independent variable with mathematical equations was attained with simple linear regression analysis, while the relationships between a dependent variable and two or more independent variables were explained with mathematical equations using a multivariate linear regression analysis.

Ethical Principles of Research

The study protocol was approved by the İnönü University local ethics committee (Decision number: 2022/2917). Consent form was obtained from all participants to conduct the research.

RESULTS

The participants included in the study were divided into two groups as the BPPV group (n=35) and the MD group (n=31). The comparison of demographic variables according to their distribution between groups is shown in Table 1.

There was no statistically significant difference between the groups according to gender and age variable (p>0.05, Table 1). The groups showed a homogeneous distribution according to gender and age variables. There was a statistically significant difference between the groups in terms of hearing loss, tinnitus, feeling of fullness, headache, sensitivity to light, and sensitivity to noise (p<0.05, Table 1).

There was a statistically significant difference between the groups according to the EVRS score (p<0.05, Table 2).

There was a statistically significant difference between the groups in terms of “satisfaction with health” and “physical health” scores of the participants included in the study (p<0.05, Table 3). There was no statistically significant difference between the groups in terms of “general quality of life”, “psychological health”, “social relations” and “environment” sub-scores (p>0.05, Table 3).

Table 1. Comparison of demographic variables according to their intergroup distribution

Variable		BPPV	MD	p Value
		Number (%)		
Sex	Female	18 (51%.4)	15 (48%.4)	0.805 ^a
	Male	17 (48%.6)	16 (51%.6)	
Hearing Loss	Yes	(-)	30 (96%.8)	0.001 ^{*b}
	No	35 (100%)	1 (3%.2)	
Tinnitus	Yes	5 (14%.3)	31 (100%)	0.001 ^{*b}
	No	30 (85%.7)	(-)	
Feeling of fullness	Yes	(-)	31 (100%)	0.001 ^{*b}
	No	35 (100%)	(-)	
Headache	Yes	2 (5%.7)	12 (38%.7)	0.003 ^{*b}
	No	33 (94%.3)	19 (61%.3)	
Sensitivity to light	Yes	1 (2%.9)	12 (38%.7)	0.001 ^{*b}
	No	34 (97%.1)	19 (61%.3)	
Sensitivity to noise	Yes	1 (2%.9)	12 (38%.7)	0.001 ^{*b}
	No	34 (97%.1)	19 (61%.3)	
		BPPV	MD	p Value
Age		M (Min-Max)		
		50 (31–59)	47 (29–59)	0.053 ^b

p^b: Chi-square test value (χ²); M: median; Min: minimum value; Max: maximum value; p^b: Mann-Whitney test p value, *p<0.05: There is a statistically significant difference between the groups.

Table 2. Comparison of EVRS scores according to their distribution between groups

EVRS	BPPV	MD	p Value
	M (Min-Max)		
	12 (6–16)	14 (7–17)	0.014*

M: Median; test: Mann-Whitney U Test; Min: minimum value; Max: maximum value; p value: statistical significance, *p<0.05: There is a statistically significant difference between the groups.

Table 3. Comparison of WHOQOL-BREF scores according to their distribution between groups

Subdomains	BPPV	MD	p Value
	M (Min-Max)		
General quality of life	2 (1–4)	3 (1–5)	0.057
Satisfaction with health	2 (1–3)	3 (1–5)	0.006*
Physical health	50 (7.14 – 78.57)	64.29 (7.14–96.43)	0.007*
Psychological health	54.17 (20.83–83.33)	62.5 (12.5 – 91.67)	0.193
Social relations	66.67 (25–100)	58.33 (33.33 – 100)	0.855
Environment	56.25 (25–87.5)	59.38 (25–96.88)	0.402

M: Median; Min: minimum value; Max: maximum value; Test: Mann-Whitney U Test; p value: statistical significance, *p<0.05: There is a statistically significant difference between the groups.

Table 4. Correlation between EVRS and WHOQOL-BREF subscale scores

		BPPV		MD	
		r Value	p Value	r Value	p Value
EVRS	General quality of life	-0.540	0.001*	-0.282	0.124
	Satisfaction with health	-0.481	0.003*	-0.276	0.132
	Physical health	-0.660	0.001*	-0.541	0.002*
	Psychological health	-0.708	0.001*	-0.391	0.029*
	Social relations	-0.306	0.073	-0.481	0.006*
	Environment	-0.380	0.024*	-0.456	0.010*

r: Spearman rank correlation coefficient; p: Statistical Significance; *p<0.05; There is a statistically significant relationship between the scores.

In the BPPV group, a significant correlation was observed between the EVRS score and the WHOQOL-BREF general quality of life, satisfaction with health, physical health, psychological health and environment sub-dimensions. In the MD group, a significant correlation was observed between the EVRS score and the WHOQOL-BREF physical health, psychological health, social relations and environment sub-dimensions.

Table 4 shows the multivariate regression analysis performed by establishing a model in which EVRS scores were the dependent variable and “quality of life scale sub-dimensions” were the independent variables in the BPPV and MD groups.

DISCUSSION

Benign paroxysmal positional vertigo is the most common peripheral vestibular disorder causing short-term dizziness induced by head movements (Özdilek, Dikmen, Acar, Aksoy, & Korkut, 2019). As a result of the head moving in the direction of the affected canal, a short but disturbing dizziness occurs, which affects the daily life of patients and reduces the quality of life (Petri et al., 2017; Pereira, Santos, & Volpe, 2010; Lopez-Escamez, Gamiz, Fernandez-Perez, & Gomez-Fiñana, 2005). Meniere’s disease, which is another common peripheral vestibular disorder, is a disease characterized by episodic vertigo attacks together with hearing loss, tinnitus, and aural fullness symptoms. This disease can lead to conditions that negatively affect the quality of life such as activity limitation, sleep disturbance, fatigue, depression, and irritability as a result of the symptoms seen together (Hiller, & Goebel, 1992; Mendel, Bergenius, & Langius, 1999; Yardley, Beech, & Weinman, 2001).

Studies have reported that the incidence of BPPV and MD is higher in women compared to men (Von Brevern, et al., 2007; Harris et al., 2010, Havia et al., 2005). In our study, however, no statistical difference was found in terms of gender. The incidence of BPPV and MD increases with age. The mean

age of the BPPV patients and the MD patients in the present study was in the middle age group, which is consistent with the literature (Arbağ, Bedri, Keleş, Ülkü, & Öztürk, 2003; Çağlar, Çelebi, Karaca, & Çelik, 2013). Hearing loss, tinnitus, and a feeling of fullness in the ear are the main symptoms of MD. In our study, these symptoms were also observed in the MD group. In BPPV, auditory symptoms are not observed in patients due to the pathophysiology of the disease (Bhattacharyya, et al., 2008). Our study is compatible with the literature in this respect. In our study, when migraine-related symptoms such as dizziness, sensitivity to light, and sensitivity to noise were questioned, these symptoms were found to be more common in MD patients compared to BPPV patients. In the literature, there are studies suggesting that MD is associated with migraine and reporting that auditory pressure triggers migraine and causes headache, and sensitivity to light and noise (Liu, & Xu, 2016; Radtke, Lempert, Gresty, Brookes, Bronstein, & Neuhauser, 2002). In our study, 38.7% of MD patients stated that they experienced headache, sensitivity to light, and sensitivity to noise, which is compatible with the literature.

In our study, EVRS scores were higher in MD patients compared to BPPV patients. Longer duration of vertigo and longer and more severe dizziness in MD attacks compared to BPPV explain the higher EVRS scores. There are studies in the literature reporting that BPPV and MD affect the quality of life of patients (Lopez-Escamez et al., 2005; Yardley et al. 2001; Yuan, Yu, Shi, Ke, & Zhang, 2015). Yardley, Dibb, & Osborne (2003) evaluated the quality of life of 509 MD patients with a scale whose subgroups were similar to the one we used in our study. They found that the “physical function”, “social function”, and “psychological health” sub-domain scores of MD patients were lower than the scores of patients who did not have long-term health problems. Monzani, Genovese, Rovatti, Ludovica Malagoli, Rigatelli, & Guidetti (2006) evaluated the quality of life of 50 BPPV patients and stated that the quality of life of BPPV patients was affected compared to the healthy control group. A healthy control group was not used in our study, but the fact that our scale scores were lower than the maximum value in the BPPV and MD groups indicates that both diseases affect the quality of life. However, according to the WHOQOL-BREF scale, “health satisfaction” and “physical health” sub-scores were statistically lower in BPPV patients compared to MD patients. This may be due to the fact that although people with MD can continue their daily lives between attacks, patients in BPPV have to experience dizziness continuously unless they are treated or vestibular compensation does develop. In Meniere’s patients, more intense symptoms are observed during the attack period compared to the in between attacks. In the attack period, the quality of life of the person is more affected (Manzari, Burgess, MacDougall, Bradshaw, & Curtoys, 2011). In addition, there are also studies in the literature suggesting that MD affects the quality of life more than other vestibular system diseases because it is characterized by unexpected vertigo attacks (Yardley, Beech, & Weinman,

2001; Yardley, & Putman, 1992). However, the fact that there is evidence that people living with someone who can support them have a better quality of life (Yardley et al. 2003) or that factors such as coping skills and environmental support cause variation in the level of impact of patients' quality of life (Green Jr et al., 2007) explain these differences in the literature.

Handa et al. (2005) evaluated the quality of life in 70 BPPV patients, 70 MD patients, and 15 comorbid patients, and used the Dizziness Disability Inventory (DDI) with "physical", "emotional", and "functional" sub-dimensions, and they reported that the quality of life was negatively affected as the severity of disability increased in both BPPV and MD groups. Green et al. (2007) examined the quality of life of MD patients using the WHOQOL-BREF scale, which we used in our study. They also used the Vertigo Symptom Scale (VSS), similar to the EVRS, which we used as a criterion for evaluating complaints of vertigo in our study, and a statistically significant relationship was found between these two scales. In our study, we also found

a statistically significant relationship between our EVRS scores and WHOQOL-BREF sub-scores in the MD group, which shows that the increase in the complaints of vertigo of the individual negatively affects the quality of life.

CONCLUSION

Benign paroxysmal positional vertigo and MD can negatively affect the quality of life of individuals and cause activity restriction, psychological disorders such as depression and anxiety, and social isolation. In addition to early diagnosis and early treatment of the disease, it is also very important for individuals to receive psychological support when necessary. The multidisciplinary approach to the disease affects the prognosis of the disease and enables the individual to overcome this process more easily. In future studies, it is recommended to increase the sample group and evaluate MD patients by grouping them based on attack and the post-attack periods.

Ethics Committee Approval: İnönü University Institute of Health Sciences Non-Invasive Clinical Research Ethics Committee (Decision number: 2022/2917).

Peer-review: Externally peer-reviewed.

Informed Consent: Written informed consent was obtained from the participants.

Author Contributions: Concept – SCC, BK, DUC; Design – SCC, BK, DUC, TB; Supervision – DUC, TB; Resources – SCC, SD, DUC; Data Collection and/or processing – SCC, BK, SD; Analysis and/or interpretation – BK, SD; Literature Search – SCC, BK, DUC; Writing Manuscript– SCC, BK, DUC.

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Yazar Katkıları: Fikir- SCC, BK, DUC; Tasarım – SCC, BK, DUC, TB, EKO; Denetleme – DUC, TB; Kaynak – SCC, SD, DUC; Veri Toplanması ve/veya İşlemesi – SCC, BK, SD; Analiz ve/veya Yorum – BK, SD; Literatür Taraması – SCC, BK, DUC; Yazıyı Yazan – SCC, BK, DUC.

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