

Anxiety, Mood, and Personality Disorders in Patients with Benign Paroxysmal Positional Vertigo

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ABSTRACT

Introduction: This study presents the current prevalence of anxiety, mood, and personality disorders as well as factors associated with the existence of psychiatric disorders in patients with benign paroxysmal positional vertigo (BPPV).

Methods: The study sample comprised 46 patients with BPPV and 74 control subjects. Anxiety and mood disorders were ascertained via the Structured Clinical Interview for the Diagnostic and Statistical Manual (DSM) of Mental Disorders, Fourth Edition/Clinical Version. Personality disorders were diagnosed via the Structured Clinical Interview for DSM, Revised Third Edition, Personality Disorders.

Results: Of the 46 patients, 18 (39.1%) had at least one mood or anxiety disorder and 13 (28.3%) had at least one personality disorder. The most

common Axis I and Axis II disorders in the patient group were major depression in 8 (17.4%) and obsessive-compulsive personality disorder in 10 (21.7%) patients, respectively. It was found that major depression ($p=0.021$), generalized anxiety disorder ($p=0.026$) and obsessive-compulsive personality disorder ($p=0.001$) were more prevalent in the BPPV group compared with the control group.

Conclusion: Results suggest that psychiatric disturbances should be carefully checked in patients with BPPV due to the relatively high rate of comorbidity.

Keywords: Benign paroxysmal positional vertigo, anxiety, depression, personality disorders, psychiatric disorders

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INTRODUCTION

Benign paroxysmal positional vertigo (BPPV) is one of the most commonly recognized peripheral vestibular vertigo encountered in neuro-otology clinics, with a reported prevalence of 10.7–64.0 cases per 100,000 people and a lifetime prevalence of 2.4% (1). It is characterized by short repeated episodes of mild to intense vertigo induced by special head position changes and accompanied by imbalance and nausea. Spontaneous remissions and recurrences are frequent; the annual rate of recurrence is approximately 15% (2).

Benign paroxysmal positional vertigo is the most common etiology of recurrent vertigo and is caused by abnormal stimulation of the cupula by free-floating otoliths (canalolithiasis) or otoliths that have adhered to the cupula (cupulolithiasis) within any of the three semicircular canals. Most patients often complain of loss of balance and unstable gait during and between paroxysmal vertigo attacks. The diagnosis of BPPV is confirmed based on patient history and provocation maneuvers, such as the Dix–Hallpike test or the supine head-turning test.

It has been suggested that BPPV is associated with psychiatric disorders, such as depression (3,4), panic attacks, and other anxiety disorders, in predisposed individuals (5,6). Anxiety is the most studied symptoms linked to vertigo. Feelings of dizziness have been evaluated as the most anxiety-provoking sensation in patients susceptible to anxiety compared with other bodily symptoms (7). In particular, vestibular vertigo may trigger symptoms of anxiety through neuronal circuits in the parabrachial nucleus they partly share. Information from the vestibular apparatus is processed in parabrachial nucleus with further connections to the amygdalae, infralimbic cortex, and hypothalamus, where emotional responses are modulated (8).

Comorbid psychiatric disorders in this population are underestimated and poorly dealt with, with further impact on disability, excessive health care utilization, and reduced quality of life (5,9,10,11). Although psychiatric comorbidities in some vestibular disorders, such as Meniere's disease or vestibular neuronitis, or association with non-specific vertigo or dizziness have been extensively described

(10,12,13), few studies exist concerning psychiatric disorders in patients with BPPV.

In neuro-otological field, an association between psychiatric conditions and vestibular diseases has been underscored (14,15), but how much these problems are involved in BPPV is unknown. Most of the previous studies on the association between BPPV and psychiatric disorders were based not only on psychiatric interviews but also on measurements. Furthermore, most of these studies did not include control groups. Personality disorders have not been fully studied and the few present studies have no control groups. The objective of this study was to investigate the current prevalence of anxiety, mood, and personality disorders in BPPV patients.

METHODS

Forty-six patients who consecutively presented to the Neurology and Otolaryngology Outpatient Clinic of Necmettin Erbakan University Meram School of Medicine Hospital with acute dizziness due to BPPV were included in the study group. This study was conducted between April 2015 and October 2015. Patients with any acute complaint apart from dizziness, those with acute/chronic neurological, otological, and any other systemic diseases were excluded from the study. Patients on psychiatric medication, those with alcohol or any other substance addiction, and those using any drug with a side effect of dizziness were also excluded from the study. The study sample also included a control group, which was composed of 74 hospital personnel and their relatives who were matched for the sociodemographic characteristics of the BPPV patients. They had the same exclusion criteria as the patient group. The objectives and procedures of the present study were explained to all participants, and written informed consent was obtained. The study was performed in accordance with the Declaration of Helsinki and approved by the local ethics committee of the Necmettin Erbakan University, Meram School of Medicine (approve number: 14567952-050/440).

Patients were referred to the principal author (neurologist and otolaryngologist in the outpatient department) for evaluation of BPPV and screened for eligibility of enrollment. After obtaining clinical history and a thorough physical examination, Dix-Hallpike or supine head-turning tests were performed. BPPV was diagnosed based on the following criteria: 1. symptoms compatible with BPPV (episodes of transient attacks of rotational vertigo induced by sudden head positional changes without auditory symptoms); 2. positional vertigo and positional nystagmus provoked by Dix-Hallpike maneuver (nystagmus that is vertical with a torsional component appears after a short latency, the head is turned sideways 45°; it ended after approximately 30 s and decreased when the positioning test was repeated). After the neuro-otological assessments and recording of the sociodemographic features, patients were referred to the psychiatry outpatient clinic of the same hospital. The number of attacks was defined as the number of disease episodes of BPPV. The attack time represents the duration of a BPPV disease episode. Psychiatric disorders were assessed by psychiatrists with at least 4 years of experience with psychiatric disorders and diagnostic instruments. They were blinded to the neuro-otological evaluation of the patients. Mood and anxiety disorders were ascertained via the Structured Clinical Interview for the Diagnostic and Statistical Manual (DSM) of Mental Disorders, Fourth Edition/Clinical Version (SCID-I/CV) (16). Personality disorders were diagnosed via the Structured

Clinical Interview for DSM, Revised Third Edition, Personality Disorders (SCID-II) (17). The onset time of psychiatric diagnoses was established from patient reports.

Statistical Analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences 16.0 for Windows (SPSS Inc; Chicago, IL, USA). For comparisons between the study groups, t-test (for normally distributions) and Mann-Whitney U test (for abnormal distributions) were used for continuous variables and c2 test (for 3 or more×2 variables) or Fisher's exact test (for 2×2 variables) were used for categorical variables. All significant levels were two-tailed and set at 0.05.

RESULTS

The mean age of the study sample (n=120) was 40.42±11.22 (range: 21.69) years. Participants were mostly females (n=104, 86.7%), married (n=99, 82.5%), and primary school graduates (n=79, 65.8%). There was no significant difference between the patient and control groups in terms of sociodemographic characteristics (Table 1).

Table 2 shows the current prevalence rate of anxiety, mood, and personality disorders in patients with BPPV and control subjects. Eighteen (39.1%) patients with BPPV met the criteria of at least one mood or anxiety disorder according to SCID-I. Among the patients, the current prevalence rate of at least one mood disorder and any anxiety disorder was 21.7% and 26.1%, respectively. Specifically, the most common psychiatric disorders were major depression (n=8, 17.4%), generalized anxiety disorder (n=7, 15.2%), and obsessive-compulsive disorder (n=5, 10.9%). These three diagnoses were also significantly more prevalent in the patient group than in the control group.

The prevalence rate of dysthymic disorder, panic disorder, specific phobia, social phobia, and posttraumatic stress disorder in the study groups were similar. None of the participants were diagnosed with bipolar disorder (Table 2).

Table 1. Sociodemographic characteristics of the study sample

	Patient group n=46	Control group n=74	P
Age, mean±SD, years	38.97±10.31	41.32±11.73	0.196 ^a
Sex, n (%)			0.783 ^b
Female	39 (84.8)	65 (87.8)	
Male	7 (15.2)	9 (12.2)	
Education, n (%)			0.556 ^c
Primary school	27 (58.7)	52 (70.3)	
Secondary school	13 (28.3)	13 (17.6)	
University	6 (13.6)	9 (12.2)	
Marital status, n (%)			0.599 ^c
Single	4 (8.7)	10 (13.5)	
Married	40 (87.0)	59 (79.7)	
Widowed, divorced, or separated	2 (4.3)	5 (6.8)	

^at-test, ^bFisher's exact test, ^cX² test. SD: standard deviation

Table 2. Current prevalence rate of mood, anxiety and personality disorders in the study groups

Psychiatric disorders, n (%)	Patient group n=46	Control group n=74	P ^a
Any mood disorder	10 (21.7)	5 (6.8)	0.023
Major depression	8 (17.4)	3 (4.1)	0.021
Dysthymic disorder	4 (8.7)	2 (2.7)	0.202
Bipolar disorder	0 (0)	0 (0)	-
Any anxiety disorder	12 (26.1)	6 (8.1)	0.016
Panic disorder	2 (4.3)	1 (1.4)	0.558
Obsessive-compulsive disorder	5 (10.9)	1 (1.4)	0.030
Social phobia	1 (2.2)	3 (4.1)	1.000
Specific phobia	4 (8.7)	4 (5.4)	0.481
Posttraumatic stress disorder	0 (0)	1 (1.4)	1.000
Generalized anxiety disorder	7 (15.2)	2 (2.7)	0.026
Any mood or anxiety disorder	18 (39.1)	10 (13.5)	0.002
Any axis II disorder	13 (28.3)	9 (12.2)	0.032
Avoidant	4 (8.7)	3 (4.1)	0.426
Dependent	1 (2.2)	2 (2.7)	1.000
Obsessive-compulsive	10 (21.7)	2 (2.7)	0.001
Passive-aggressive	2 (4.3)	1 (1.4)	0.558
Paranoid	1 (2.2)	1 (1.4)	1.000
Schizotypal	0 (0)	0 (0)	-
Schizoid	0 (0)	1 (1.4)	1.000
Histrionic	3 (6.5)	1 (1.4)	0.157
Borderline	0 (0)	2 (2.7)	0.523
Narcissistic	0 (0)	1 (1.4)	1.000
Antisocial	0 (0)	0 (0)	-

^aFisher's exact test

Thirteen patients with BPPV had any personality disorder, with obsessive-compulsive personality disorder (n=10, 21.7%) and avoidant personality disorder (n=4, 8.7%) being the most frequent ones. Compared with the control group, the prevalence rate of any Axis II disorder and obsessive-compulsive personality disorder was significantly higher in the BPPV group. Schizotypal and antisocial personality disorders were not identified in the two study groups (Table 2).

The average number of attacks among the patients with BPPV was 2.78 ± 1.93 and the average attack time was 11.60 ± 13.06 days. The total vertigo duration in patients with and without Axis I disorder was 11.05 ± 12.73 and 11.96 ± 13.49 days ($p=0.704$), respectively. The average number of attacks was 3.22 ± 2.10 and 2.50 ± 1.79 ($p=0.209$), respectively. Patients with and without personality disorders had a total vertigo duration of 14.07 ± 15.36 and 10.63 ± 12.17 days ($p=0.216$), respectively, and the average number of attacks was 2.23 ± 1.42 and 3.01 ± 2.07 ($p=0.236$), respectively.

DISCUSSION

Between 20% and 50% of vertiginous patients in different clinical settings have comorbid psychiatric symptoms (5,18,19). The risk is increased in patients with prior psychiatric disorders, but vertigo may

trigger symptoms in patients with no history of psychiatric problems (14). Vertiginous patients with comorbid psychiatric symptoms suffer a more likely recurrent or persisting sense of vertigo without objective findings in neuro-otological tests (20). Regardless of the etiology of vertigo, patients with both dizziness and psychological distress may remain symptomatic, even after normal vestibular compensation (21).

In the present study, it is unclear whether the existence of a psychiatric disorder can contribute to the occurrence of BPPV due to our study design. However, in our sample, we did not find any difference between patients with and without Axis I psychiatric disorders in terms of average attack time and total vertigo duration. In addition, the average attack time (11.60 days) in patients with vertigo does not allow for the diagnosis of psychiatric disorders. Therefore, we believe that the prevalence of Axis I psychiatric disorders in our patients with vertigo includes psychiatric diagnosis prior to the occurrence of vertigo. Consequently, we believe that patients with psychiatric disorders might be vulnerable to BPPV, rather than those with BPPV being vulnerable to psychiatric disorders.

The association between dizziness and anxiety disorders is quite striking. Eckhardt-Henn and colleagues, in their study, reported 45% of patients with psychiatric disorder-induced vertigo and reported that 41% of patients with both psychiatric and vestibular disturbances (mixed etiology) had anxiety disorders (11). In a study by Staab to analyze the association between dizziness and anxiety disorder, 1/3 of the patients had dizziness related to anxiety disorder and the other 1/3 of the patients had neuro-otological symptoms added to the already existing anxiety disorder (22). Whereas the remaining 1/3 of the patients developed anxiety disorders due to neuro-otological disorders. In one study, anxiety was found in 73.5% and depression in 41% of patients with BPPV (23,24). Symptoms of anxiety are common in vertiginous patients regardless of the primary cause of vertigo. The prevalence rates have varied from 15% to 76% (5,18,25,26), whereas in community samples, the 12-month prevalence rate of anxiety ranged from 9.5% to 14.5% (27,28). In our sample, although any anxiety disorder was determined in 26.1% of patients with BPPV, the rate was only 8.1% in the control subjects. We found that the prevalence rate of generalized anxiety disorder was 15.2% in patients with BPPV and 2.7% in the control subjects. The prevalence rate established in the BPPV patients was found to be higher than the estimated prevalence rate of the current anxiety disorder and generalized anxiety disorder in the general population (27,29). Disparities between the findings in our study and those in other studies are due to differences in tools and sampling. In our study, we used SCID-I/CV. The severity of most symptoms in previous studies was based on evaluation measurements, which were not only inadequate for the diagnosis of psychiatric disorders but could also make the rates be seen as high.

In this study, the overall current prevalence rate of anxiety and mood disorders was significantly higher in patients with BPPV than in the control subjects. We have no studies comparing mood disorders between patient and control groups in published literature. Moreover, the number of noncomparative studies is very few.

Major depression was the most prevalent Axis I disorder with a rate of 17.4% in BPPV patients. Depression is a psychological consequence that occurs following stressful or persistent symptoms such as

dizziness (30,31). Dizziness may result in activity restrictions in daily life and psychosocial consequences due to the often persistent nature of some types of dizziness.

Depression is highly comorbid with many somatic illnesses. In vertiginous patients, a previous history of affective disorder appears to predict a new episode of depression. Depressive symptoms tend to appear 4–6 weeks after the initial symptoms of vertigo (14). The prevalence rates of depression in vertiginous patients ranged from 4% to 62% (5,25,26,32). Recently, Ferrari et al. (33) reported that 21.7% of patients with BPPV had mild to moderate depression and 9.8% had severe depression. Similarly, Ketola et al. (34) reported that the prevalence rate of clinically significant depressive symptoms was 19%. However, similar to anxiety disorders, these studies have a methodology including self-report scale or questionnaire rather than structured clinical interview conducted by a psychiatrist. The mechanisms underlying the association between vertigo and psychiatric disorders are not clear. The neural circuits related to vestibular system and anxiety disorder are interconnected. While the monoaminergic tract that goes to the vestibular system is responsible for the effects of anxiety on the vestibular system, the parabrachial nuclear network controls the emotional feedback of the vestibular system. The parabrachial nucleus is believed to be the anatomic structure where interoceptive information from the main homeostatic functions such as respiration, circulation, and balance is filtered and integrated. Vestibular, respiratory, and cardiovascular systems in a state of interaction trigger panic attacks, development of agoraphobia, and persistence of anxiety signs in individuals and patients prone to autonomic stimulation as a result of vestibular function disorders (35).

To date, the association between BPPV and specific anxiety disorders such as panic disorder and obsessive-compulsive disorder has not been adequately studied. We found no association between panic disorder and BPPV, although the prevalence rate of this disorder in patients with BPPV was three-fold compared with the controls. This result could be due to the small sample size of the present study. On the other hand, the present study suggests that obsessive-compulsive disorder is observed more frequently in patients with BPPV (10.9%) than in the control subjects (1.4%). However, this possible association should be confirmed by further studies.

The current results suggest that a considerable number of patients with BPPV in outpatient clinics have Axis II psychiatric disorders. We found the prevalence rate of any Axis II disorder as 28.3% in patients with BPPV and 12.2% in the control subjects. Epidemiological studies have reported 5.3%–14.5% prevalence rates for any personality disorder in the general population (27,36). Data on this topic are very limited. Godemann et al. (37) found dependent and obsessive-compulsive personalities in patients with strong tendency to persistent vertigo without the objective signs of a vestibular lesion (37). Recently, Ketola et al. (34) reported that 63 of 100 patients with vertigo had a personality disorder. The authors also noted that the most common personality disorder was obsessive-compulsive personality disorder (46%), which is consistent with our findings. However, Ketola et al. (34) reported a higher prevalence rate of any Axis II diagnosis and most specific diagnoses than ours. In our study, personality disorders were diagnosed via structured clinical interviews, whereas Ketola et al. (34) used a personality questionnaire to determine the personality

disorders. This may explain the differences between the findings of these two studies.

Being of a cross-sectional nature, the present study is limited by an insufficiency to indicate whether the evaluated Axis I or Axis II psychiatric disorders have causal relevance to BPPV. The sample size in the current study is relatively small and is not representative of all patients with vertigo and the general population. The relatively small sample size is another limitation of the current study. In addition, we did not examine any family history of mental disorders. Furthermore, we did not examine the other factors related to the participations, such as employment, economic status, and psychiatric history. These factors can affect the current psychiatric state of the participants. Finally, in the study, subjective severity of vertigo using questionnaires was not examined. Psychiatric disorders can influence the subjective severity of BPPV. Additionally, we did not use any anxiety and depression rating scale to determine symptom severity of the anxiety and depressive disorders.

In conclusion, results of the present study suggest that patients with BPPV who were admitted to a neuro-otology outpatient clinic have frequent psychiatric disturbances. We conclude that greater attention needs to be paid to these patients. In general, they may have high levels of psychiatric symptomatology that may benefit from assessment and intervention. The aim of the health care professionals must be to reassure BPPV patients and minimize the disability that impacts their life. Therefore, to show a more compressive approach in the treatment of these patients, a multidisciplinary approach protocol comprising neurologists; ear, nose, and throat specialists; and psychiatrists should be developed. Further controlled studies with larger sample sizes should be conducted to investigate long-term effects of psychiatric disorders and their treatments in the course of BPPV.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Necmettin Erbakan University, Meram School of Medicine.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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