

## Original Article

# Types of dizziness and its relationship with psychological symptoms in patients with chronic dizziness

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**Abstract.** Dizziness could be categorized as one of the most common medical complaints of patients referred to the neurology clinics. The aim of this study was to evaluate the types of dizziness and its relationship with psychological disorders in patients with chronic complaints. We studied 179 patients ranging in age from 18 to 65 years old. Patients were asked to complete a revised questionnaire form that contained 90 questions related to the signs based on severity scale vertigo tool. Subsequently, to detect organic or non-organic vertigo, the patients were divided into two groups. For psychiatric disorders, screening questions of international standard for testing SCL-90-R were used. Vertigo severity scale was used for the evaluation of dizziness severity. To compare quantitative variables between the two groups independent t-test was used and p value of  $\leq 0.05$  was considered as significant. Of the total patient population, 70.9% were females and 74% of patients had dizziness due to organic causes while 26% had dizziness due to non-organic causes. Dimension scores related to somatic complaints, obsessive-compulsive, depression, anxiety, paranoid ideation and global severity index in individuals with non-organic vertigo was significantly higher than other groups. There was a significant direct relationship between the overall score related to intensity of dizziness and all of the questionnaire's dimensions. There was significant correlation between the extent of physical complaints and the fear for morbid ( $p < 0.001$ ). The score of extent related to dizziness/balance in patient with vertigo due to organic causes and score of extent related to autonomic/anxiety in patient with vertigo due to non-organic causes was significantly higher than in other groups.

**Keywords:** Dizziness, psychological symptoms, somatoform, disorders

## Introduction

Dizziness is the most common medical complaints of patients referred to the neurology clinic. In therapeutic practice dizziness often takes a prolonged sequence and can indulge the quality and quantity of life. Psychiatric comorbidity is common in vertiginous patients [1-6]. There is high variability related to underlying causes of dizziness. These involve as organic causes with: 1) central and peripheral vestibular disorders, 2) non-vestibular and non-organic causes including 1) somatoform disorders 2) psychiatric origin [7, 8].

Dizziness or vertigo could be related with both vestibular-balance and psychological features. A common valuation tool is the Vertigo Symptom Scale (VSS) -short form, which has two subscales: vestibular-balance and autonomic-anxiety [9]. European Evaluation of Vertigo scale (EEV) is a physician-administered questionnaire that only assesses symptoms of the vestibular syndrome:

illusion of movement, duration of illusion, motion intolerance, neurovegetative signs, and instability [10]. It looks that recently particular attentions have been made to the prevalence of psychological disorders and associated complications in patients with dizziness. Approximately 20-50% of all cases with vertigo disorders, psychological disorders have significant impact on the course of disease. According to previous study, anxiety is the most common disorders in these population which could increase their mortality and results to a worsen prognosis [11]. There are mutual relationships between anxiety and dizziness. It means that patients with unpredictable attacks of vertigo may be more prone to anxiety and develop phobic avoidance behavior subsequently. Also, patients who suffer from anxiety and severe fear during attacks of vertigo could experience more physical symptoms (dizziness) [6, 12]. In connection with high cases of dizziness associated with psychological disorders two

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models have been proposed: 1) Psychosomatic model in which patients' dizziness could be caused without any primary organic origin (somatoform original). The most common underlying causes of this kind of dizziness are anxiety disorders and phobias [13-15]. The attacks of vertigo could be as a demonstration of panic disorder [16]. 2) Somatopsychic model in which pathological effects of organic disorder is on the patient's mind, therefore it could leads to such symptoms such as dizziness, despite the determination of the original organic disorder [17]. With not any clear diagnosed cause, patients with acute vestibular disease seem to be at risk for prolonged dizziness and disability in daily life (secondary somatoform vertigo). Vestibular assessments in its' own could not determine the actual degree of disability rate in these patients [18-21]. The frequency of acute vestibular disease, the risk of psychiatric disorders such as anxiety, somatoform disorders and depression have been reported as 37.5, 14, 15 and 9 % respectively [22]. Study performed by Tschan et al., in 2010 confirmed that in patients with vestibular disorders psychiatric history are important factors linked to secondary risk of somatoform vertigo [23]. Another study on patients with organic vestibular vertigo revealed that the vestibular deficit and its' dysfunction over time have no effect on creation of the secondary somatoform vertigo [24]. It has been confirmed that organic vestibular disorder alone could not be the cause of anxiety disorders and depression in these patients [25]. Half of patients with organic vertigo syndromes suffer from secondary somatoform vertigo. Differentiation between vertigo with an organic origin underlying psychological disorders seems to be difficult. Prevalence of anxiety and fear disorders in patients with primary somatoform dizziness (non-organic) has been reported with an incidence of 45% that are comparable with a prevalence of 41% in patients with different organic vertigo syndromes. In most patients a psychological assessment (psychometric) does not perform, because the compliant is dizziness. As a result in the differential diagnosis non-organic vertigo disorders are not considered or reached to mind very late, that resulting in chronic illness and reduced quality of life. It could cause large costs to the health system [26, 27]. Considering the dizziness accompanied by psychological disorders and its impact on quality of life, the aim of this study was to determine the type of vertigo and its association with psychological disorders in patients complaining of chronic dizziness.

### Materials and Methods

This cross-sectional study was carried out in patients suffered with chronic dizziness and referred to neurology clinics between the years 2011 to 2013. Inclusion criteria were: 1) age between 18 to 65 years old, 2) chronic dizziness at least for three months, 3) absence of malignancy or other known central nervous system disease, 4) Absence of cognitive disorders due to recent brain disease or psychotic illness, and 5) lack of recent psychotherapy and psychiatric drugs. All participated patients were informed and signed the consent form.

TABLE 1  
PATEINTS DEMOGRAPHIC CHARACHTERISTICA AND SEVERITY OF DIZZINESS BASED ON THE TYPE OF VERTIGO

Variables	Organic n=133	Non-Organic n=46	P value
Age (year)	44.5±13.5 (1.167)	39.6±12.2 (1.791)	0.029
Female/Male	91/42	36/10	0.14
Severe dizziness (VSS)	18.8±10.3 (0.900)	19.3±9.5 (1.411)	0.786
Dizziness/Balance Subscale (VSS-V)	10.7±6.9 (0.608)	5.8±4.4 (0.657)	< 0.001
Autonomic/anxiety subscale (VSS-A)	8.6±5.9 (0.536)	14±7.0 (1.054)	< 0.001

TABLE 2  
COMPARISON OF THE TWO GROUPS OF PATEINTS WITH ORGANIC AND NON-ORGANIC VERTIGO

Variables	Organic n=133	Non-Organic n=46	P value
Somatization	14.0±8.4 (0.726)	17.57±9.744 (1.421)	0.018
Obsessive- compulsive	9.6±7.45 (0.643)	12.9±7.4 (1.087)	0.005
Interpersonal sensitivity	7.9±6.5 (0.563)	8.5±5.61 (0.827)	0.366
Depression	13.8±10.1 (0.875)	17.4±10.1 (1.477)	0.036
Anxiety	10.1±7.2 (0.623)	12.8±7.4 (1.084)	0.027
Aggression	4.89±4.468 (0.386)	5.1±3.43 (0.506)	0.272
Fear	4.6±4.7 (0.407)	4.5±4.6 (0.686)	0.911
Paranoid thoughts	5.7±4.6 [0.397]	7.8±5.1 (0.751)	0.012
Psychosis	7.3±6.4 (0.559)	6.8±4.6 (0.680)	0.853
Additional questions	7.4±5.3 (0.461)	8.9±5.6 (0.816)	0.112
General severity index (GSI)	0.95±0.61 (0.053)	1.15±.54 (0.081)	0.029

Sampling was based on the repeated procedure and a sample size of 179 was considered for this study. All patients were assessed by a neurologist for neurovestibular examinations included vestibular testing, equalometer performance and psychometric evaluation. Whenever it was necessary, Brain MRI was requested to evaluate organic causes. For psychometric evaluation, patients were asked to complete the given questionnaire form. For psychiatric disorders screening questions of international standard for testing SCL-90-R were used that standardized and translated in Islamic Republic of Iran [30]. This test consists of 90 questions, for evaluation of psychiatric symptoms that is answered and reported by the subjects. All provided answers to each of the tests' material on a five degrees scale were determined. The rate of discomfort was reported from none to severe. The 90 questions of this test included 9 different psychiatric dimensions related to somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobia, paranoid ideation, and psychosis. General score index or GSI for this indicator is the average score of all test questions (the scores range from zero to four can be varied). Also for the evaluation of dizziness severity in patients vertigo severity scale (VSS-SF) was used. It was included 15 questions linked to the two subscales of Vertigo/balance (VSS-V)

and autonomic/ anxiety (VSS-A). On a scale of 5 degrees questions were answered from 0 to 4. The final questionnaire score is the summing of the scores from 0 to 60 score that greater score indicating greater symptom severity. A score equal or more than 12 were defined as severe dizziness. Data were recorded in d-Base and statistical analysis was performed using SPSS for windows (version 16).

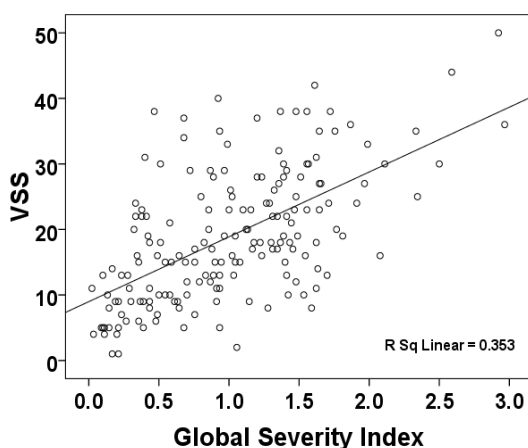
### Statistical analysis

Mean  $\pm$  SD and percentage for all variables were used. To compare quantitative variables between the two groups independent t-Test (in case of non-normal distribution of test data and Mann-Whitney) was used. Analyzes at the level of less than 0.05 was considered statistically significant.

### Results

From 184 subjects who entered the study, the SCL-90-R questionnaires form 5 subjects were incomplete which were excluded from the study. Thus the data related to 179 patients were evaluated. The mean age of all patients was  $43.2 \pm 13.2$  years old and 70.9% of the patients were females. There were 133 (74%) patients who had organic dizziness and 46 (26%) who had non-organic dizziness. Recognition of the frequency related to causes of organic-dizziness was as: benign paroxysmal positional vertigo (35.6), Meniere's disease (18.2), acute vestibulitis (16.7), vestibulopathy (9.8), migraine (7.6), vertiginous migraine (3.0), labyrinthitis (2.3), multiple sclerosis (2.3), vertical blanking interval (2.3), vertiginous seizures (1.5), and chronic inflammatory demyelinating polyneuropathy (0.8).

Figure 1 shows the relationship between the overall index of illness and severity of vertigo. Comparison of demographic and clinical characteristics of patients with organic vertigo is shown in Table 1. However, the patients with organic vertigo were older than patients with non-organic vertigo but there was not any significant differences related to gender. Between the two groups vertigo intensity scores were not different. Scores of dizziness/balance in subjects with organic-dizziness and



**Figure 1** The relationship between the overall index of illness and severity of vertigo.

scores of autonomic/anxiety in patients with non-organic vertigo was significantly higher than the other group.

Table 2 shows the comparison of the two groups of patients with organic and non-organic dizziness based on SCL-90-R questionnaire analysis. Thus, the dimensions of physical complaints, obsessive-compulsive, depression, anxiety, paranoid thought and general severity index score (GSI) in patients with non-organic vertigo was significantly higher than other groups.

There was a positive correlation between the total score of severity of vertigo and all aspects of SCL-90-R questionnaire analyzed data. Pearson correlation coefficient from somatization to phobia was significant ( $p < 0.018$ ). Also, there was a significant positive correlation between the scores of dizziness/balance and all aspects of SCL-90-R questionnaire analyzed data (Pearson correlation coefficient of 0.398 for physical complaints to 0.206 for the paranoid ideas,  $p < 0.001$ ). Between the scores of autonomic/anxiety and all aspects of SCL-90-R questionnaire analyzed data, significant positive correlation was found (Pearson correlation coefficient of  $r = 0.473$  for general indicator of imperilments to  $t = 0.279$  for phobic disorders,  $p < 0.001$ ).

### Discussion

With the aim related to the assessment of dizziness and its' association to psychological disorders in patients with chronic dizziness, it seems that psychological symptoms have a significant prevalence. There was a correlation between psychological symptoms and severity of vertigo, as psychological disorders tightened dizziness. Patients with non-organic vertigo suffer from sever dizziness. Accompanying of psychological symptoms with dizziness that has a negative impact on quality of life, could be mentioned as an important issue. This also could increase the health cost. It could be helpful for better understanding related to the pathophysiology and etiology of this association. Therefore in treatment of patients with dizziness physicians should have adequate attention to psychological symptoms and subsequently offer appropriate treatment. The result of this study is in agreement with previous publication, because benign positional vertigo was the most common diagnosed among the organic causes [3, 17, 22]. The scores related to the physical complaints, obsessive-compulsive, depression, anxiety, paranoid ideation and general severity index score (GSI) was higher in patients with non-organic vertigo than organic group, which was significantly more predictive of severe disability and emotional distress in this group [8, 26].

In another study with a sample size of 202 patients complaining of chronic dizziness, which was assessed with SCL-90-R, the highest score were related to anxiety, fear and depression [3]. However, in our study the highest score were linked to somatization, depression and anxiety. This could be due to the differences in the population studied, or might be considered as non-significant in previous studies. The importance of considering the differential diagnosis of depression and somatization disorder related to chronic dizziness has been confirmed by this investigation.

Relatively high scores of somatization, depression, anxiety and obsessive-compulsive within organic groups, indicating the need for the simultaneous use of diagnostic procedures based on organic and psychometric methods in patients with chronic dizziness. It could be suggested that this group is highly capable of presenting secondary somatoform vertigo [5, 11]. Previous publications confirmed that simultaneous presentation of organic vestibular disorders and anxiety disorders indicate neuro-anatomical communication between vestibular system and emotional response. That could have consequences as: 1) monoaminergic input to vestibular system that could make interface associated to the effects of stress, 2) parabrachial nucleus, that is a place for the information received from vestibular system, somatic and visceral receptors that through its' association with the breathing controller region in the brainstem and autonomic nervous system involved in the incidence of presentation related to physical anxiety. Also it is connected with the central nucleus of the amygdale and infralimbic cortex, which is a structure, related to the fear and avoidance behaviors. Patients older than 65 years were excluded from the study, while the highest organic vertigo has been reported in this group [26-33].

Finally, the high prevalence of psychological symptoms in this study identifies the necessity to find for scientific and practical strategies that could be able to deal effectively with these disorders. Diagnosis and effective treatment related to these disorders could improve prognosis, quality of life and patients' survival. In addition to patients' training related to methods of control and prevention of depression and anxiety, further studies related to the methods for early detection and screening of these disorders is also recommended.

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#### Conflict of Interest

The authors declare no conflicts of interest.

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