Psychiatric Disorders and Functional Impairment in Patients with Persistent Dizziness

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Objective: To determine the prevalence and predictors of psychiatric dizziness and to measure functional impairment associated with dizziness.
Design: Consecutive outpatients with a chief complaint of dizziness.
Setting: Four outpatient clinics at a military teaching hospital.
Patients: 100 dizzy patients and 25 control patients.
Measurements and main results: Structured psychiatric interviews were conducted using the Diagnostic Interview Schedule, and functional status was assessed with the Sickness Impact Profile and the 20-item MOS (Medical Outcomes Study) Short-Form. Psychiatric disorders were a primary or contributory cause of dizziness for 40% of the dizzy patients. Compared with the control patients, the dizzy patients had a higher lifetime (46% vs 32%) as well as recent (37% vs 20%) prevalence of axis I disorders. The greatest differences were in disorders of depression and somatization. The dizzy patients had a higher lifetime prevalence (23% vs 8%) as well as recent history (11% vs 0%) of major depression or dysthymia. Also, somatization disorders were strikingly more common among the dizzy patients than among the control patients (37% vs 8%, p = 0.005), with the dizzy patients reporting more than three times as many psychiatric or unexplained physical symptoms (5.2 vs 1.5). Age <40 years, related complaints of weakness or headaches, and dizziness provoked by hyperventilation or standing were independent predictors of psychiatric dizziness. The dizzy patients reported moderate functional impairment, which was most severe among those with psychiatric disorders.
Conclusions: Persistent dizziness is associated with increased functional impairment and psychiatric comorbidity, particularly depression and somatization. Moreover, psychiatric disorders aggravate the impairment that occurs with dizziness alone.
Key words: dizziness; vertigo; somatization; depression; health status; predictors; psychiatry.
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DIZZINESS confronts the primary care physician on a regular basis, generating nearly 8 million outpatient visits in the United States each year.[1] While often resolving spontaneously, dizziness can be a persistent or recurrent symptom in many patients.[2] Routine evaluation is often frustrating. In a retrospective review of medical clinical records, a definite organic diagnosis was documented for only 18% of dizzy patients.[3] Although more systematic testing frequently reveals a vestibular etiology, the cause of dizziness remains psychiatric or unexplained in nearly one out of three cases (range, 21% to 41%).[4-6] In a review of neurology consultations, dizziness was the

third most common psychogenic symptom.[7] However, neither the above studies not other reports focusing specifically on the psychologic aspects of dizziness[8-10] have used structured psychiatric interviews; the only study to do so was a small sample of highly selected patients.[11] Therefore, the true incidence and specific types of psychiatric disorders associated with the common complaint of dizziness in primary care remain unknown.

We used a structured psychiatric interview to determine the prevalence of psychiatric disorders in a large prospective study of dizziness. Because chronic symptoms[12-13] as well as psychiatric disorders[14] can be associated with considerable functional impairment, we also assessed the relative effects of dizziness and psychiatric diagnoses on functional status.

METHODS

Dizzy and Control Subjects

Dizzy subjects were prospectively enrolled by contacting within two weeks all patients who had presented to the Walter Reed Army Medical Center walk-in clinic, emergency room, internal medicine clinic, or neurology clinic either with a new complaint of dizziness or for a new evaluation of persistent or recurrent dizziness. Excluded were patients with dementia, language barriers, or dizziness that had resolved within two weeks.

Control subjects were identified by inviting all persons attending the same clinics during a two-week period to fill out a brief questionnaire inquiring about dizziness as well as willingness to participate in a study. The study was approved by the Walter Reed Clinical Investigation Committee.

Measurements

All dizzy and control subjects underwent a comprehensive medical and psychiatric evaluation, including a structured dizziness interview and medical questionnaire, a standardized physical examination, screening laboratory tests, and audiometry. A neuro-ophthamologist conducted a standardized evaluation to detect vestibular and oculomotor abnormalities. Physical, neuro-ophthamologic, and psychiatric examinations were conducted with the examiner blinded to whether the patient was a dizzy or control subject. Details of the protocol are described elsewhere.[2]

Psychiatric diagnoses were established using the most recent version of the Diagnostic Interview Sched-

ule (DIS), an extensively validated and highly reliable instrument.[15] All DIS questions and probes are almost entirely specified, making it possible to train interviewers to behave in very similar fashions.[16, 17] We administered the following DIS modules: affective disorders (major depression, dysthymia, mania); anxiety disorders (panic, generalized anxiety, phobias); somatization disorder; and alcohol abuse/dependence. For this study, dizziness was excluded from the total symptom count when diagnosing somatization disorder or syndrome.

The subjects also completed the Structured Clinical Interview for DSM-III-R* (SCID) Personality Inventory, a 101-item self-administered questionnaire that screens for specific personality traits,[18] and the Social Readjustment Rating Scale (SRRS), an inventory of recent stressful life events.[19]

Functional status was quantified with two instruments. The Sickness Impact Profile (SIP)[20] is a 130-item self-administered questionnaire used to measure functional status in 12 different categories, including both physical and psychosocial dimensions. The MOS (Medical Outcomes Study) Short-Form General Health Survey (MOS) is a 20-item questionnaire[21] for assessing the functional impairment associated with medical as well as psychiatric disorders in primary care patients.[14, 22]

Determining the Cause of Dizziness

The protocol for establishing the most likely cause of dizziness for each patient has been previously described.[2] Briefly, all data were abstracted onto standard forms, which were independently reviewed by three investigators, who individually recorded what they felt was the primary cause of each patient's dizziness. Any disagreements were arbitrated by consensus. When several causes could potentially explain the findings but one cause was felt to be predominant, the investigators assigned a primary cause and one or more contributory causes. Psychiatric disease was considered the primary cause if the patient: 1) met formal criteria for a psychiatric disorder on the DIS or had markedly abnormal personality scores (SCID ≥ 30) or stress scores (SRRS ≥ 150) and 2) had a nondiagnostic physical, laboratory, and vestibular evaluation. Psychiatric disease was considered a contributory cause if evaluation revealed an organic cause for the dizziness but the patient also met the psychiatric criteria described above, and investigators agreed that these psychiatric factors were aggravating the patient's symptoms.

Statistical Analysis

Data were analyzed with SPSS-PC. Group comparisons were made using analysis of variance for continu-

ous variables and chi-square analysis for categorial variables. Variables that on univariate analysis differed between patients with psychiatric and nonpsychiatric dizziness at $p < 0.15$ were eligible for entry into the logistic regression model to determine independent predictors of psychiatric disease.

RESULTS

Patient Characteristics

During the ten-month study period, we prospectively identified 185 patients with a chief complaint of dizziness, of whom 51 reported resolution or substantial improvement by two-weeks. Of the 134 potential eligible patients, 12 refused to participate, 11 initially agreed but did not keep their appointments, and 11 could not be contacted. During the two weeks that we recruited control patients by questionnaire, there were 118 nondizzy clinic patients who were not interested in participating in a study, 30 who were interested but not evaluated, and 25 who became actual control patients. The 25 control patients were older than the 148 persons not evaluated (66 vs 58 yrs, $p = 0.01$), but the two groups were similar in terms of gender and medical comorbidity.

The 100 dizzy and 25 control subjects were similar in terms of sociodemographic characteristics and medical comorbidity (Table 1) and are typical of patients seen in an internal medicine practice.[23] More than half (54%) of the patients said that dizziness had interfered with their activities a lot. Work loss attributable to dizziness was reported by eight (20%) of the 40 patients who were employed outside of the home, with a median of three sick days per patient for these eight patients. Less than half (41%) of the patients had found anything that relieved their symptoms, although 59% had taken some form of medication. As shown in Table 1, psychiatric disorders and functional status were the factors that most distinguished dizzy patients from control patients.

Psychiatric Disorders

The lifetime and active (one-year) prevalence of axis I disorders is shown in Table 2. Depressive and somatization disorders accounted for the greatest differences: 23% of the dizzy subjects vs 8% of the control subjects ($p = 0.09$) had experienced at least one depressive disorder in their lifetime; 11% vs 0% ($p = 0.08$) had experienced depression in the past year; and 37% vs 8% ($p = 0.005$) met criteria for either somatization disorder or somatization syndrome, despite our decision to exclude dizziness from the symptom count.

While axis I disorders were the primary focus in our study, the dizzy and control subjects also completed self-report inventories that screened for personality disorders and stress. On the SCID Personality Inventory, there was a strong association between axis I disorders and SCID scores: the 46 dizzy subjects and eight control

TABLE 1

Characteristics of the Study Subjects

	Dizzy Subjects ($n = 100$)	Control Subjects ($n = 25$)	p
Age—mean ± SD (years)	61.7 ± 14.8	66.4 ± 6.6	0.12
Gender—female (%)	59	40	0.09
Race—white (%)	72	64	
Education—mean ± SD (years)	14.5 ± 2.9	14.7 ± 2.6	0.82
No. diseases—mean ± SD	1.7 ± 1.2	2.1 ± 1.5	0.20
Sickness Impact Profile score—mean ± SD	8.6 ± 9.1	4.6 ± 5.2	0.04
MOS (Medical Outcomes Study) Short-Form score, general—mean ± SD	54 ± 23	70 ± 19	0.001
Psychiatric symptoms on the Diagnostic Interview Schedule—mean ± SD	15.3 ± 12.8	7.4 ± 9.4	0.004
Stress score on the Social Readjustment Rating Scale—mean ± SD	100 ± 79	72 ± 54	0.10
Personality score on the Structured Clinical Interview for DSM-III-R—mean ± SD	22.9 ± 12.6	18.3 ± 12.2	0.11
Unexplained physical symptoms—mean ± SD	5.2 ± 3.6	1.5 ± 1.9	<0.001

TABLE 2

Prevalence (%) of Psychiatric Disorders in Dizzy Patients and Control Patients

Psychiatric Disorder	Lifetime Dizzy	Lifetime Control	Active (One-year) Dizzy	Active (One-year) Control
Somatization syndrome*	32	8	—	—
Phobia	24	12	24	12
Major depression	19	4	8	0
Alcohol abuse/dependence	13	20	6	4
Dysthymia	12	8	4	0
Panic	6	4	4	4
Generalized anxiety	5	8	4	0
Somatization disorder*	5	0	—	—
Any, except somatization syndrome	46	32	37	20
Any, except somatization syndrome and minor phobias†	41	24	31	12

*Somatization disorder is ≥ 13 unexplained symptoms. Somatization syndrome is ≥ 6 symptoms in women (≥ 4 in men), excluding dizziness. Since symptom count is cumulative over years, lifetime and active prevalences are identical.

†Minor = all phobias except agoraphobia, social phobia, or > 2 simple phobias.

patients who had axis I disorders had higher SCID scores (28.4 and 27.6) than did the 54 dizzy subjects and 17 controls who did not have an axis I disorder (18.2 and 13.8). Stress scores on the SRRS were higher for the 46 dizzy patients with axis I disorders than for the dizzy patients without axis I disorders or for the control patients with or without axis I disorders (130.4 vs 74.6, 74.8, and 70.7, p < 0.001).

Functional Status

The dizzy patients reported considerably more functional impairment than did the control patients (Table 1). On the 20-item MOS, the dizzy patients had lower scores on all six subscales, and four of these were statistically significant: mental health, general health

perceptions, physical functioning, and bodily pain. On the 136-item SIP, where higher scores indicate worse function, the dizzy patients reported significantly more global, physical, and psychosocial impairment.

Figure 1 demonstrates the addictive effects of dizziness and psychiatric disorders on functional impairment. For five of the six MOS subscales, patients with *neither* dizziness nor a psychiatric disorder had the best functional status, patients with dizziness or a psychiatric disorder alone had intermediate function, and patients with *both* problems experienced the worst function. The SIP data showed a similar additive effect of dizziness and psychiatric disorders on functional impairment. Finally, there was a strong correlation between the number of medically unexplained symptoms and all measures of functional impairment.

Predictors of Psychiatric Dizziness

Psychiatric disease was felt to be the primary cause of dizziness for 16 patients and a contributory factor for another 24. The proportions of patients with vestibular, psychiatric, and other causes of dizziness were similar among the four clinics of origin. When asked what they felt was the likely cause of their dizziness, ten of the 40 patients with psychiatric dizziness offered an organic cause, while 30 had no idea. Of interest, no patient volunteered the possibility of a psychiatric etiology.

Table 3 compares the 40 dizzy patients for whom psychiatric factors were at least partially responsible for their dizziness with the 60 patients whose dizziness had a nonpsychiatric etiology. Of course, formal psychiatric measures differed markedly between the two groups, and psychiatric dizziness was associated with more functional impairment and unexplained symptoms. Patients with psychiatric dizziness were also more likely to report associated symptoms and aggravating factors and to find that their dizziness was readily induced by a variety of maneuvers. Moreover, this tendency held true even for clinical variables not significant at the 0.05 level: patients with psychiatric dizziness endorsed 21 of

FIGURE 1. Effects of dizziness and psychiatric disorders on five areas of functional status measured by the 20-item MOS (Medical Outcomes Study) Short-Form: role functioning, mental health, physical functioning, bodily pain, and general health perceptions. Patient groups are control and dizzy subjects without and with axis I psychiatric disorders ($n = 17, 8, 54,$ and 46, respectively). Differences are significant by analysis of variance for mental health, general health perceptions, and bodily pain at $p < 0.005$, and for role functioning and physical functioning at $p < 0.05$.
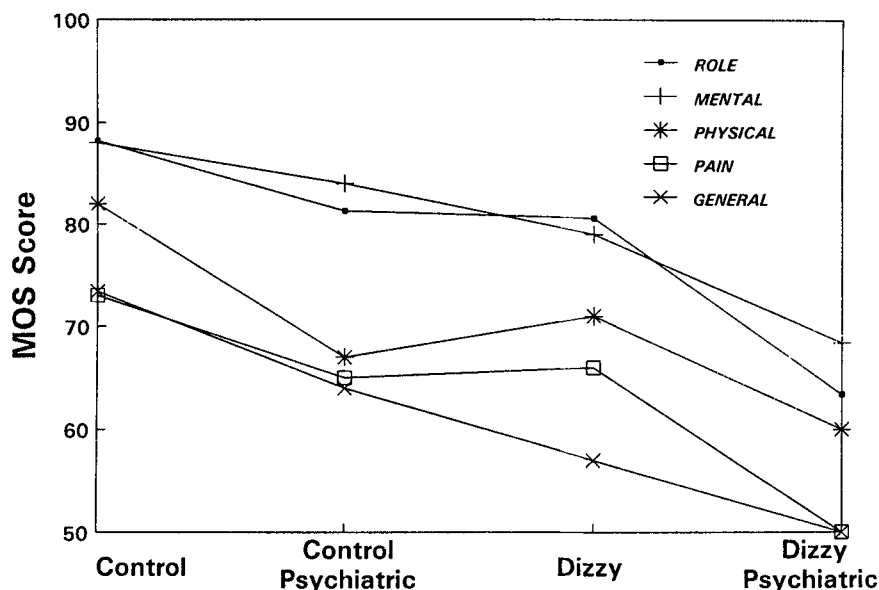
23 associated symptoms or precipitating factors at a higher rate and were more likely to experience their dizziness following six provocative maneuvers.

Five clinical variables remained independent predictors of psychiatric dizziness following logistic regression: age < 40 years; complaints of weakness or headaches; and dizziness inducible by hyperventilation (on physical examination) or standing (by patient re-

port). Table 4 shows the odds ratios and confidence intervals for these five predictors. When we entered the five-item general health perception score from the MOS into our model, a score of 55 or less was also an independent albeit weaker predictor of psychiatric dizziness ($OR = 2.9$; 95% CI, $1.2-7.4$). Thus, poor perceived health status also increases the likelihood of psychiatric disease.

TABLE 3

Characteristics of Patients with Psychiatric and Nonpsychiatric Dizziness

	Psychiatric ($n = 40$)	Nonpsychiatric ($n = 60$)	p
Age — mean $\pm$ SD (years)	57.7 ± 17.8	64.3 ± 11.8	0.03
Gender — women (%)	63	57	0.56
Education — mean $\pm$ SD (years)	14.3 ± 2.7	14.7 ± 3.0	0.45
No. diseases — mean $\pm$ SD	2.0 ± 1.4	1.5 ± 1.1	0.07
Chronicity of dizziness — mean $\pm$ SD (weeks)	217 ± 310	200 ± 305	0.79
Daily dizziness (%)	55	38	0.10
Dizzy spells last > 30 minutes (%)	45	23	0.03
Family history of alcoholism (%)	45	22	0.02
Dizziness impairs function (%)	65	45	0.05
Sickness Impact Profile score			
Global — mean $\pm$ SD	14.4 ± 10.0	4.7 ± 5.7	<0.0005
Physical — mean $\pm$ SD	10.8 ± 10.7	4.2 ± 6.7	<0.001
Psychosocial — mean $\pm$ SD	17.9 ± 13.0	4.5 ± 6.8	<0.0005
MOS (Medical Outcomes Study) Short-Form score general — mean $\pm$ SD	43.8 ± 22.5	60.2 ± 21.3	<0.0005
Unexplained physical symptoms — mean $\pm$ SD	7.7 ± 3.8	3.3 ± 2.1	<0.0005
Stress score, Social Readjustment Rating Scale — mean $\pm$ SD	135 ± 99	76 ± 51	0.001
Personality score, Structured Clinical Interview for DSM-III-R — mean $\pm$ SD	30 ± 12	18 ± 10	<0.0005
Dizziness produced on examination by:			
Hyperventilation (%)	50	20	0.007
Standing up (%)	55	27	0.02
Rotating five times (%)	96	80	0.04
Associated symptoms			
Weakness (%)	73	33	0.0002
Headaches (%)	58	21	0.0007
Dizziness upon standing (%)	80	52	0.004
Dizziness upon closing eyes (%)	43	16	0.003
Numbness or tingling (%)	68	48	0.02
Confusion or memory impairment (%)	58	33	0.02
Nausea or vomiting (%)	45	21	0.02
Trouble walking when dizzy (%)	65	40	0.04

TABLE 4
Clinical Predictors of Psychiatric Dizziness by Multivariate Analysis

Clinical Predictor	Multivariate Odds Ratio	95% Confidence Interval	p
Weakness	6.2	2.0–18.9	0.002
Hyperventilation (on examination) worsens dizziness	6.5	2.0–21.4	0.002
Standing up (by history) worsens dizziness	7.5	2.0–28.4	0.003
Headaches	5.2	1.6–16.4	0.006
Age < 40 years	7.8	1.1–55.3	0.04

DISCUSSION

Dizziness is associated with substantial psychiatric comorbidity and functional impairment. Somatization was particularly common, with more than one-third of our dizzy patients' qualifying for either somatization disorder or somatization syndrome, even after excluding dizziness from the symptom count. Somatization syndrome entails fewer unexplained symptoms (six in women or four in men) than does somatization disorder (13 in either sex) and therefore has a much greater lifetime prevalence than does the full disorder in a community population (11.6% vs 0.1%).[24] In our study, 32 dizzy patients had somatization syndrome while only five had the full disorder. Among these 37 patients, there was a 38% current prevalence and 57% lifetime prevalence of a depressive or anxiety disorder. Clinicians should look for potentially manageable depression or anxiety in the treatment of the dizzy patient with multiple unexplained symptoms.

Besides being a common marker for depression and anxiety, somatization leads to functional impairment as well as excessive health care utilization and costs.[24-26] The management of somatization disorder can be improved through coordinated care by a primary physician, avoidance of unnecessary testing and treatment, regularly scheduled clinic visits, and repeated reassurance.[27, 28] The benefits of a similar strategy in patients with lesser degrees of somatization should be explored, since somatization syndrome is so prevalent in patients with dizziness and probably in those with other persistent symptoms as well.

Depression also appeared to be more common in patients with persistent dizziness. While studies have shown that depression may be present in 10% or more of medical outpatients, it may remain undiagnosed at least half of the time.[29, 30] Patients with depression frequently present with physical complaints that tend to mask the underlying emotional etiology.[31] Since depression is potentially more manageable than many of the vestibular and other organic causes of persistent dizziness, depression should be considered early in the evaluation rather than routinely reserved as a diagnosis of exclusion.

Psychiatric disorders appeared to cause or aggravate symptoms for 40% of our dizzy patients. Independent predictors of psychiatric dizziness included age less than 40 years, complaints of weakness or headaches, and dizziness reproduced by hyperventilation or standing. Patients with psychiatric dizziness were more likely than other dizzy patients to endorse a wide range of symptoms and precipitating factors and to experience dizziness following a variety of provocative maneuvers. In such patients, dizziness may be just one symptom in a state of heightened bodily awareness and sensitivity to nonspecific stimuli.[32] For example, hyperventilation was the sole cause of dizziness for only one patient; most patients who developed symptoms in response to hyperventilation had either a vestibular or a primary psychiatric disorder to account for their dizziness.[2]

The degree of functional impairment experienced by our dizzy patients is similar to that reported by patients with arthritis, pulmonary disease, angina, diabetes, and other medical disorders.[22] Previous research has demonstrated that persistent symptoms, such as fatigue[12] and back pain,[13] as well as psychiatric disorders, such as depression,[14, 33] produce functional impairment equal to or worse than that associated with chronic medical illnesses. Dizziness should not be dismissed as a "minor complaint."

Our study has several limitations. Being certain of a psychiatric etiology for somatic symptoms is difficult. This is complicated by the fact that dizziness is multifactorial for one out of two patients.[2] Using multiple raters, explicit criteria, and a structured psychiatric evaluation makes our etiologic classification more rigorous than those of previous studies. At the least, we have identified factors that increase the likelihood of a concomitant if not causative psychiatric disorder. While the number of control patients in our study was sufficient to demonstrate greater somatization among dizzy patients, a larger control group would be required to confirm what also appears to be an increased prevalence of depression.

Finally, while patients with psychiatric disorders could theoretically overestimate functional impairment on self-report measures, the SIP and MOS have been extensively validated for a wide variety of medical and psychiatric conditions. Moreover, limitations perceived by dizzy patients with concomitant psychopathology may in fact accurately reflect their illness experience.

In conclusion, persistent dizziness is associated with functional impairment as well as psychiatric comorbidity, particularly somatization and depression. Brief educational interventions can improve the primary care physician's recognition and management of psychiatric disorders.[34-36] It is hoped that such training coupled with further research will ultimately lead to better outcomes in patients presenting with persistent dizziness.

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