Psychological characteristics of patients with Ménière's disease compared with patients with vertigo, tinnitus, or hearing loss

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Abstract

An association between Ménière's disease and psychological distress is frequently reported. Patients who do not have Ménière's disease but who have similar symptoms also experience various kinds of psychological disturbances. We conducted a study to investigate the relationship between Ménière's disease and personality traits, illness behavior, depression, and anxiety. We compared these factors in 77 patients who had Ménière's disease and 133 controls who did not have the disease but had one of its symptoms—either vertigo, tinnitus, or hearing loss. The mental status of study participants was assessed with standard tests. Patients in both groups had higher than normal levels of anxiety and neuroticism. The only significant difference between the two groups was a higher rate of extroversion in the Ménière's disease group. Minor differences emerged when Ménière's patients with tinnitus or vertigo were compared with similar controls. Relationships between psychological observations and otologic symptomatology or an otologic diagnosis were not specific, which illustrates the need to consider the role of illness behavior and personality as targets for psychological support or therapy associated with ENT treatment.

Introduction

Many symptoms typical of some otologic diseases—such as vertigo, tinnitus, and hearing loss—are accompanied by psychological disturbances. Symptoms may be present simultaneously, as is the case with Ménière's disease, or alone.

Ménière's disease is generally associated with great psychological distress. Some authors contend that this distress occurs secondary to the disease; other authors believe that the disease itself is actually psychosomatic in origin.[1-5] The psychological distress may manifest as emotional instability, high levels of neuroticism, low levels of extroversion, a tendency toward social disadaptation, and a predisposition to anxiety and depression or a depressive state.

Associations have been noted between Ménière's disease and nervous and meticulous behavior and between Ménière's disease and marital status. A relationship has also been observed between vertigo attacks and distressing factors in Ménière's disease patients, but the relationship appears to be subjective. Approximately 75% of patients with Ménière's disease report that their symptoms limit certain aspects of their life, but the relationship between their discomfort and life satisfaction is only moderate.[6,7]

Some authors believe that there is a genetic predisposition to Ménière's disease.[8-10] In the 1990s, our group conducted a study of 50 Ménière's disease patients to evaluate their personality traits, illness behavior, depression, and anxiety.[11] We found that these patients had significantly higher than normal mean scores for neuroticism and psychological perception of disease. On the other hand, these patients had low scores for affective inhibition (even without great psychological distress, as confirmed by high scores for depression, anxiety, neuroticism, hypochondriasis, disease conviction, dysphoria, and irritability) and low scores for denial. We interpreted these findings as partly representing a result of predisposition factors (e.g., anxiety traits and neuroticism) and partly as representing a sequela of Ménière's disease and indicative of abnormal illness behavior.

Vertigo is probably the symptom that is most frequently associated with psychological disturbances. In the "anxiety neurosis" description of classic psychopathology, the relationship between anxiety and vertigo has already been recognized. In the psychodynamic interpretation, vertigo in particular is considered to be associated with separation anxiety, of which it seems to be a somatic expression.

Some reviews of the link between panic disturbances and

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vestibular symptoms have been published.[12,13] The greater prevalence of psychiatric disorders in vertiginous patients who have no evidence of otologic changes may mean that psychiatric symptomatology is not simply a reaction to vertigo. Some authors also support the hypothesis that panic disorder is often associated with functional vestibular pathology.[14,15] The link between anxiety disturbances and vertigo is generally interpreted as an effect of somatopsychic and psychosomatic processes, one of which may be sensitization at the cerebral level.[16] Besides anxiety, phobia, and panic attacks (with or without agoraphobia), vertigo is accompanied by depression, dysthymia, and alteration in the quality of life.[17-19]

It has been observed that tinnitus more frequently affects patients with somatic and hypochondrial disturbances than general medical outpatients, indicating that unexplained tinnitus may be a symptom of somatization. Tinnitus sufferers often present with depression, irritability, tension, and sleeping disturbances that modify their quality of life. Some subjects seem to be able to cope positively with the symptom, but others respond negatively.[20,21]

These observations led us to study illness behavior in association with personality traits, anxiety, and depression in such patients, and we published a report in 1996.[11] We found that tinnitus patients had a high state anxiety level along with introversion, neurotic tendency, affective inhibition, and high denial. Cluster analysis identified two subgroups of patients. One subgroup responded normally to psychological tests except for high denial, and the other had high scores for anxiety and depression accompanied by introversion, neuroticism, and illness behavior alterations with high degrees of hypochondriasis and disease conviction, dysphoria, and irritability. The second subgroup was also more often affected by high-intensity tinnitus and, before or after its onset, by psychological symptoms and/or functional somatic symptoms. The second subgroup also made more frequent use of psychotropic drugs. These data are compatible with the hypothesis of a somatopsychic and psychosomatic vicious circle.

Tinnitus and vertigo caused by otologic function pathologies are less frequently associated with psychological suffering. Nevertheless, insecurity in social behavior caused by hearing loss causes feelings of loss of control, which may induce stress reactions. Hearing loss influences the quality of life negatively and may be associated with depression and great emotional disturbance, both social and communicative, particularly in older patients. It also has a negative influence on intimate relations. Psychological suffering is related to the possible concomitant loss of psychological resources, as well as to patients' psychological characteristics.[22-25]

All these observations highlight the frequent association between otologic symptoms and psychological suffering in relation to basic psychological structure and individual illness behavior, although we cannot establish the priority between the psychosomatic or somatopsychic hypotheses. However, from the clinical point of view, it seems more important to recognize whether specific manifestations of psychological suffering and illness behavior exist in relation to otologic symptoms in order to provide specific psychological and psychopharmacologic therapy. Therefore, the question is whether specific elements of suffering among patients with Ménière's disease can be identified in comparison with those who have similar but non-Ménière's symptoms. Perhaps vertigo, tinnitus, and hearing loss are related to a specific type of psychological suffering precisely because of their specific intrinsic differences.[26-28]

The present study was carried out to verify whether the various psychological disturbances are characteristic of each otologic symptom (vertigo, tinnitus, and hearing loss) and whether there is a relationship between these and the psychological distress that appears in the case of Ménière's disease, in which the three symptoms are associated with each other.

Patients and methods

Our study population was made up of 212 consecutively presenting patients who were under observation at the ENT Section of Padova University Hospital in Padova, Italy. This group was made up of 79 patients with Ménière's disease and 133 controls who were affected by either vertigo (n = 28), tinnitus (n = 80), or hearing loss (n = 25) for whom a diagnosis of Ménière's disease was excluded.

The selection criteria for patients with Ménière's disease[11] and tinnitus[24] were stated in reports of our previous studies. Specifically, only Ménière's patients with the three pathognomonic symptoms of the disease—vertigo, tinnitus, and hearing loss—were considered; Ménière's patients who had only the cochlear or vestibular type of disease and those who were in the acute phase were excluded. Only patients who complained of tinnitus and who spontaneously asked to be examined by an ENT specialist for the single symptom of subjective tinnitus of the idiopathic type not associated with other symptoms and/or otologic pathologies were included. Patients suffering from vertigo were included only if there was no association with tinnitus or hearing loss; conversely, hearing loss patients were included only if there was no association with vertigo or tinnitus. Subjects who had experienced head injuries, recent surgery, or a chronic systemic disease and/or damage to other organs were excluded.

All patients underwent a detailed clinical interview, including questions about any psychological or functional somatic symptoms that were present before and/or after the onset of their otologic disturbance (table 1). A psychologi-

cal evaluation was performed by a psychologist, who used the Eysenck Personality Inventory, the State-Trait Anxiety Inventory, the Zung Self-Rating Depression Scale, and the Illness Behavior Questionnaire (IBQ).[29-32]

Five statistical analyses were performed:

- a comparison of mean test scores of Ménière's patients and controls in relation to normal values using the Student's t test
- multivariate analysis of variance (MANOVA) of test scores considered as dependent variables, using successively different independent sets of variables: (1) Ménière's patients vs. controls, (2) Ménière's patients vs. those with vertigo vs. those with tinnitus, (3) those with vertigo vs. those with tinnitus vs. all patients with hearing loss, including Ménière's patients who were reclassified according to their dominant symptom, and (4) six independent subgroups identified by classifying patients according to symptom and according to the presence or absence of Ménière's disease
- univariate analysis with the Student's t test to evaluate the effect of sociodemographic and clinical variables on test scores. Variables were dichotomized if not already dichotomous. A p value of 0.005 was defined to eliminate type I error due to the high number of tests performed.
- a MANOVA applied to test scores as dependent variables and to diagnostic and clinical variables, which in previous analyses had influenced tests significantly, as independent variables, in order to evaluate interaction effects
- a complete hierarchical linkage cluster analysis to evaluate whether global test scores were capable of defining any homogenous subgroups of patients with particular features highlighted by the psychological tests and, if so, what the relationship was between these features and the otologic diagnosis and symptomatology

Table 1. Demographic, social, and clinical features of study patients

	n* (%)
Female sex	118/212 (55.7)
Age ≤40 yr	67/211 (31.8)
Married	165/209 (78.9)
Employed	109/210 (51.9)
School attendance ≤11 yr	140/208 (67.3)
Previous psychological symptoms	122/196 (62.2)
Subsequent psychological symptoms	146/196 (74.5)
Previous functional disturbances	96/199 (48.2)
Subsequent functional disturbances	165/199 (82.9)
Psychotropic drug use	79/199 (39.7)
ENT hospitalizations	133/206 (64.6)
Other hospitalizations	151/206 (73.3)
Duration of disease ≥24 mo	124/210 (59.0)
Difference of ≥6 mo between symptom onset and diagnosis	70/210 (33.3)
Family history of psychiatric disturbances	103/198 (52.0)

* Not all data were available for all patients.

The chi-square test and Pearson's correlation coefficient were also applied where appropriate for further evaluation of statistical significance.

Two patients were excluded from the final evaluation because of incomplete data.

Table 2. Comparison of normal values with findings in Ménière's disease patients and controls

Assessment	Normal values	Ménière's patients (n = 77)			Controls (n = 133)		
		Mean	SD	p Value	Mean	SD	p Value
Zung—depression	<50	47.3	11.5	0.067	48.3	11.9	0.134
STAI—state anxiety	<40	42.7	11.0	0.056	43.7	11.4	0.001
STAI—trait anxiety	<41	42.1	10.6	0.418	42.9	11.2	0.073
IBQ1—hypochondriasis	3.7	3.4	2.4	0.308	3.5	2.2	0.418
IBQ2—disease conviction	2.6	2.8	1.6	0.280	2.6	1.7	0.897
IBQ3—psychosomatic perception	1.8	2.2	1.0	0.001	2.0	0.9	0.015
IBQ4—affective inhibition	2.7	2.1	1.6	0.001	2.2	1.6	0.000
IBQ5—dysphoria	2.7	2.4	1.7	0.204	2.6	1.8	0.569
IBQ6—denial	2.7	3.1	1.7	0.089	3.4	1.4	0.000
IBQ7—irritability	2.4	2.0	1.4	0.194	1.9	1.5	0.011
EPI—psychoticism	3.38	3.9	2.2	0.294	3.8	2.1	0.332
EPI—extroversion	13.13	13.1	3.6	0.960	11.8	4.1	0.006
EPI—neuroticism	11.16	12.6	4.6	0.016	12.6	5.1	0.003

Key: SD = standard deviation; STAI = State-Trait Anxiety Inventory; IBQ = Illness Behavior Questionnaire; EPI = Eysenck Personality Inventory.

Results

A comparison of normative data reported in the literature with the mean test scores of Ménière's patients and controls showed that depressive symptomatology was only slightly lower than the pathologic threshold, whereas state anxiety was higher than the norm in controls and tendentially higher in all patients (table 2). Personality factors revealed higher scores for neuroticism for both Ménière's patients and controls. Extroversion was much lower than the norm in controls with respect to Ménière's patients. Psychoticism was tendentially higher in both groups. The IBQ scores in relation to the reference values from groups of patients hospitalized for various diseases were higher for psychological perception of disease and lower for affective inhibition in both groups. Controls presented greater denial and lower irritability compared with normal values; in Ménière's patients, these aspects were present, but not to a significant extent.

The results of the MANOVA, considered as dependent variables, and the diagnostic groupings, considered as independent variables (Ménière's patients vs. controls), did not show any significant difference ($p < 0.249$) as a main effect, although controls had significantly lower scores for extroversion ($p < 0.002$).

Analyses of groups distinguished according to otologic diagnosis (Ménière's disease, vertigo, tinnitus, and hearing loss) did not show any significant differences, nor were any differences observed when patients were distinguished according to predominant symptom.

Considering variable diagnosis (Ménière's vs. controls) and dominant symptom together, an interaction effect was found ($p < 0.046$), due essentially to affective inhibition ($p < 0.003$), which was greater in Ménière's patients with hearing loss, and to irritability ($p < 0.05$), which was greater in Ménière's patients with vertigo (table 3, first column).

The MANOVA performed on six independent groups, obtained by reclassifying patients by diagnosis (Ménière's vs. controls) and dominant symptom, did not reveal any significant differences (table 3). However, greater affective inhibition in tinnitus sufferers was confirmed, and greater hypochondriasis for vertigo patients was shown in the Ménière's group ($p < 0.026$). In controls differentiated according to dominant symptom, a significant difference for irritability was shown, particularly in tinnitus sufferers compared with hearing loss subjects ($p < 0.047$), but in any case lower in relation to reference values (2.1 vs. 2.7). Ménière's patients with hearing loss had significantly higher scores for irritability than did non-Ménière's patients with hearing loss ($p < 0.041$). Lastly, comparisons between tinnitus sufferers, divided into Ménière's patients and controls, revealed a significant main effect ($p < 0.036$) due to the greater introversion of controls ($p < 0.006$), accompanied by a tendency toward greater hypochondriasis ($p < 0.05$) and lower psychological perception of disease ($p < 0.06$) (table 3).

Data for patients with vertigo also showed a tendency toward greater suffering, particularly with regard to depression and anxiety, although statistical significance was not reached. In particular, vertigo controls had mean scores for depression above the normal threshold; for Ménière's patients with vertigo, the scores were slightly lower. Table 4 shows the significance of comparisons between test scores compared with other hospitalizations, demographic, and clinical variables. Some demographic variables influenced the test results. Sex produced a higher score for depression and a lower score for denial in women. Age gave rise to greater irritability (IBQ) in younger subjects (≤40 yr), as already noted in the literature. Marital status, employment status, and education level did not seem to influence test results substantially.

Clinical variables, such as disease duration and hospitalizations, did not seem to influence test scores significantly. Disease duration was evaluated both as time from first onset of symptoms (mean: 75 mo; maximum: 477) and time from diagnosis (mean: 52 mo; maximum: 477). The difference in months between the onset of symptoms and diagnosis (mean: 23; maximum: 353) was also examined. Dichotomous evaluations did not show significant differences. Onset of symptomatology more than 24 months earlier occurred in 59.0% of patients (124 of 210). A lapse between symptom onset and diagnosis of 6 months or more occurred in 33.3% of patients (70 of 210). More accurate evaluation using Pearson's correlation coefficient revealed only a moderate positive correlation between disease conviction and months from disease onset and between disease conviction and months from diagnosis ($r = 0.15$ and 0.14, respectively; $p < 0.05$).

A family history of psychological symptoms gave rise to lower denial scores and a tendency toward higher scores for state and trait anxiety, disease conviction, and dysphoria. A history of functional somatic symptoms prior to disease onset (different from those typical of the disease) was associated with higher scores for depression and trait anxiety and tendentially higher scores for state

All patients (N = 210)		
Mean	SD	p Value
48.1	11.8	0.029
43.6	11.5	0.000
42.8	11.1	0.028
3.5	2.3	0.263
2.7	1.7	0.459
2.1	1.0	0.000
2.1	1.6	0.000
2.6	1.8	0.294
3.3	1.5	0.022
2.0	1.5	0.000
3.8	2.2	0.007
12.2	4.1	0.002
12.6	5.1	0.000

anxiety, neuroticism, disease conviction, and dysphoria. Similar but more significant differences were observed in patients who reported functional somatic symptoms only after disease onset.

Psychological symptoms after disease onset produced significant differences in almost all tests, with higher scores mainly for depression, state and trait anxiety, neuroticism, disease conviction, and dysphoria, and tendentially higher scores for hypochondriasis and irritability. Psychological symptoms before disease onset had a lesser effect: higher scores for neuroticism and dysphoria and tendentially higher scores for anxiety and depression, and lower scores for denial. A history of previous psychotropic drug use was the condition that most greatly influenced test results. Scores

Table 3. Mean test scores of six subgroups defined by dividing Ménière's disease patients and controls according to the dominant s

	Diagnostic group (A)					
	Ménière's patients (n = 77)			Controls (n = 133)		
Dominant symptom (B)	Vertigo (1) (n = 33)	Tinnitus (2) (n = 35)	Hearing loss (3) (n = 9)	Vertigo (4) (n = 28)	Tinnitus (5) (n = 80)	Hearing loss (6) (n = 25)
Zung—depression	49.5	45.7	45.3	50.3	47.4	48.7
STAI—state anxiety	44.2	42.0	40.9	44.0	43.9	42.5
STAI—trait anxiety	44.2	41.4	39.4	44.5	42.2	42.0
IBQ1—hypochondriasis	4.1	2.5	3.4	3.4	3.5	3.7
IBQ2—disease conviction	3.1	2.6	2.4	2.3	2.7	2.6
IBQ3—psychosomatic perception	2.2	2.4	1.9	2.1	2.0	1.9
IBQ4—affective inhibition	2.0	1.7	3.6	2.2	2.2	2.1
IBQ5—dysphoria	2.6	2.4	2.3	2.9	2.6	2.3
IBQ6—denial	3.0	3.0	3.4	3.2	3.4	3.4
IBQ7—irritability	2.3	1.8	2.1	1.6	2.1	1.4
EPI—psychoticism	4.2	3.4	4.3	3.6	3.8	3.7
EPI—extroversion	12.7	14.1	10.9	11.4	11.9	11.9
EPI—neuroticism	12.5	12.8	12.3	13.6	12.4	11.7

* Some comparisons and interactions, and relative p values, were derived from MANOVA results.
Key: For an explanation of the "Dominant symptom" column, see table 2.

Table 4. Statistical significance of psychological test analyses (Student's t test)

	Zung	STAI-S	STAI-T	IBQ1	IBQ2	IBQ3	IBQ4
Female sex	B		T				
Age ≤40 yr	–T						
Married							
Employed							
School attendance ≤11 yr				T			T
Previous psychological symptoms	T	T	T				
Subsequent psychological symptoms	B	A	A	T	A		
Previous functional disturbances	A	T	B		T		
Subsequent functional disturbances	A	B	B		A		
Psychotropic drug use	A	A	A	T	A		
ENT hospitalizations							
Other hospitalizations	T						
Duration of disease ≥24 mo							
Difference of ≥6 mo between symptom onset and diagnosis							
Family history of psychiatric disturbances		T	T		T		

Key: B = $p < 0.005$; T = trend $p < 0.05$ and > 0.005; A = $p \leq 0.0001$. Minus sign indicates lower scores in this group. Dichotomized variables typically distinguish first of two groups of each variable. For an explanation of the abbreviated column headings, see table 2.

were significantly higher for depression, anxiety, neuroticism, disease conviction, and dysphoria and tendentially higher for hypochondriasis; they tended to be lower for extroversion and denial.

Multivariate analysis of test results, diagnosis, and significant clinical variables performed to evaluate interaction effects demonstrated the absence of any interaction among variables, diagnosis, and dominant symptom. No significant interaction effects were observed, even among the most significant clinical variables, such as previous psychotropic drug use and psychological or somatic symptomatology subsequent to disease onset.

Psychotropic drug use and subsequent somatic symptoms confirmed their effects on test results, but there was no interaction. Although psychological symptoms demonstrated a positive trend in some evaluation scales, they did not influence the test results significantly in multivariate analysis (table 5). In detail, somatic symptoms subsequent to otologic disturbance were associated with higher depression scores (mean: 49.4 vs. 38.7), higher disease conviction scores (mean: 2.9 vs. 1.8), and lower psychological perception of disease scores (mean: 2.0 vs. 2.5). Previous psychotropic drug use was associated with higher scores for state anxiety (mean: 44.5 vs. 37.8), trait anxiety (mean: 44.5 vs. 37.8), dysphoria (mean: 3.3 vs. 1.6), and neuroticism (mean: 13.8 vs. 9.7).

On a psychological level, cluster analysis led to the classification of patients into two clearly differentiated groups: cluster I and cluster II (table 6). (Only 3 patients fell into a third group, and they were not considered for further analysis). Cluster I (little suffering) patients had low scores on psychological suffering tests and high scores for denial. Personality traits were normal extroversion and low neuroticism. Cluster II (high suffering) patients, who accounted for 41% of the entire group, showed very high levels of depression and anxiety; personality traits were particularly high neuroticism, low extroversion, and high psychoticism. The IBQ yielded high scores for hypochondriasis, disease conviction, dysphoria, and irritability. Affective inhibition was significantly higher in cluster II than in cluster I, although still within the normal range. Denial was significantly lower in cluster II but approached normal values.

Patient distribution in cluster II was no different for Ménière's patients than controls. No differences in relation to dominant symptom were observed.

symptom*

Comparisons and interactions (p value)

A/B	1/2/3	4/5/6	2/5
0.046	0.140	0.862	0.036
0.900	0.372	0.535	0.510
0.866	0.641	0.852	0.418
0.897	0.376	0.631	0.723
0.097	0.026	0.885	0.054
0.240	0.361	0.587	0.856
0.565	0.390	0.732	0.063
0.033	0.008	0.993	0.205
0.906	0.827	0.463	0.546
0.702	0.775	0.704	0.160
0.050	0.319	0.047	0.236
0.316	0.281	0.930	0.365
0.190	0.053	0.890	0.006
0.633	0.964	0.385	0.734

IBQ5	IBQ6	IBQ7	EPI-P	EPI-E	EPI-N
	–B				
		B			
		–T			
B	–T				A
A		T			A
T					T
T					B
A	–T			–T	A
–T					
			–T		
T	–B				

Discussion

Scores on the symptomatologic scale (anxiety and depression) showed that our patients remained at the upper limit of normal for depression and did not go beyond that threshold. State and trait anxiety clearly exceeded indicative thresholds, demonstrating that this population has evident psychological distress as confirmed by the higher scores for neuroticism and psychoticism revealed by the Eysenck test (table 2).

Study of illness behavior in comparison with the normal IBQ values revealed that the role played by denial was higher in our sample patients, particularly the controls. Irritability, affective inhibition, and psychological interpretation of disease were also greater (table 3). Although it

Table 5. MANOVA of main effects of psychological (PSPO) and somatic (SMPO) symptoms subsequent to disease and use of psychotropic drugs (PSIF)

	PSPO (1) p < 0.569		SMPO (2) p < 0.014		PSIF (3) p < 0.023	
Dominant symptom	F	p Value	F	p Value	F	p Value
Zung—depression	0.97	0.327	15.78	0.000	2.63	0.107
STAI—state anxiety	2.54	0.113	1.95	0.165	7.27	0.008
STAI—trait anxiety	3.80	0.053	3.26	0.073	6.57	0.011
IBQ1—hypochondriasis	1.85	0.176	1.99	0.160	0.21	0.644
IBQ2—disease conviction	3.53	0.062	9.03	0.003	2.65	0.105
IBQ3—psychosomatic perception	0.06	0.801	5.84	0.017	1.34	0.249
IBQ4—affective inhibition	1.14	0.287	0.51	0.476	0.00	0.976
IBQ5—dysphoria	2.17	0.142	0.52	0.473	16.81	0.000
IBQ6—denial	0.06	0.804	0.47	0.493	1.88	0.172
IBQ7—irritability	1.45	0.230	0.27	0.602	1.87	0.173
EPI—psychoticism	3.72	0.055	0.79	0.376	0.24	0.627
EPI—extroversion	0.23	0.633	0.60	0.439	2.84	0.093
EPI—neuroticism	0.82	0.365	1.37	0.243	13.50	0.000

Key: F = estimated parameter by MANOVA. For an explanation of the "Dominant symptom" column, see table 2.
Degree of freedom (d.f.) = 1.188; interactions 1/2, 1/3, 2/3, and 1/2/3 were not significant (d.f.: 13.176).

might be thought that these features—particularly greater anxiety, irritability, and denial—were related to duration of disease, only a slight relation with disease conviction was in fact observed.

Comparisons between Ménière's patients and controls in the various tests were negative in terms of statistical significance except for extroversion, due mostly to Ménière's patients with tinnitus. This may be a casual feature because of the slight prevalence of cluster I patients (higher extroversion) among the Ménière's tinnitus patients in relation to the other symptomatologic groups.

Psychological and/or functional somatic symptoms after disease onset and previous psychotropic drug use were particularly important variables in influencing test scores. However, analysis of data clearly demonstrated that the relationship between otologic disturbance and test scores was not influenced by these variables.

Cluster analysis also showed that in cluster II, abnormal

Table 6. Test values in clusters I and II

	Normal values	Cluster I (n = 122)		Cluster II (n = 87)		Cluster II vs. normal	Cluster I vs. cluster II
		Mean	SD	Mean	SD	p Value	p Value
Zung—depression	<50	40.05	6.892	58.68	7.560	0.000	0.000
STAI—state anxiety	<40	37.43	7.815	52.63	9.651	0.000	0.000
STAI—trait anxiety	<41	35.60	7.085	53.08	7.098	0.000	0.000
IBQ1—hypochondriasis	3.7	2.63	1.997	4.77	2.166	0.000	0.000
IBQ2—disease conviction	2.6	2.04	1.417	3.63	1.533	0.000	0.000
IBQ3—psychosomatic perception	1.8	2.00	0.813	2.25	1.143	0.001	0.063
IBQ4—affective inhibition	2.7	1.79	1.501	2.60	1.667	0.617	0.000
IBQ5—dysphoria	2.7	1.57	1.426	4.02	1.201	0.000	0.000
IBQ6—denial	2.7	3.66	1.327	2.63	1.578	0.711	0.000
IBQ7—irritability	2.4	1.57	1.373	2.56	1.344	0.322	0.000
EPI—psychoticism	3.38	3.46	2.144	4.34	2.307	0.001	0.005
EPI—extroversion	13.13	13.04	3.793	10.91	4.116	0.000	0.000
EPI—neuroticism	11.16	9.64	3.537	16.85	3.568	0.000	0.000

Key: See table 2.

illness behavior with introvert and neurotic personality traits was not related to otologic symptoms or diagnosis but rather to previous psychological or functional somatic symptoms. One hypothesis is that this group simply represents the prevalence of psychological suffering in an otologic patient sample. This group may have psychological suffering with frequencies compatible with those found in similar studies—for instance, among general practitioners' patients, in whom there is a well-defined psychiatric diagnosis rate of 24%, to which must be added 40% of under-threshold diagnoses or isolated psychological symptoms.[1]

Another hypothesis is that a specific link between psychological suffering and otologic symptomatology emerges only among a particular subgroup of patients. In fact, the two different features appear on the psychological level. On one hand, there are patients with functional somatic symptomatology, higher disease conviction, and lower psychological disease perception who show psychological disturbances in the body through a mechanism of somatization and who show signs of being more depressed. On the other hand, there are clearly more neurotic patients who mainly show anxiety, dysphoria, and previous psychotropic drug use. However, these features do not seem to be related to either otologic symptoms or diagnosis.

Some differences emerged in the three subgroups (vertigo, tinnitus, and hearing loss) between Ménière's and non-Ménière's patients (table 3). Non-Ménière's patients with tinnitus have lower extroversion, tendentially greater hypochondriasis, and lower psychological perception of illness scores. Within the group of Ménière's patients with vertigo, there was a tendency toward greater hypochondriasis; in those with tinnitus, there was a tendency toward greater extroversion but high neuroticism; in those with hearing loss, there was a tendency toward greater affective inhibition. In both Ménière's patients and controls, there was a similar gradient in the anxiety and depression scores, with vertigo patients heading the list for suffering, followed by those with tinnitus and hearing loss. However, because of their low significance, these data cannot be interpreted in a clinically applicable manner.

It is also possible that some differences resulted from (or others were masked by) the inevitable heterogeneity of the control patients in the three subgroups. The Ménière's patients were also heterogenous, according to the differing importance of one of the typical symptoms, and they were not completely comparable with the groups of controls who presented with the other two symptoms.

In conclusion, our data provide little or no support for the hypothesis that there are different specific relationships between Ménière's disease and vertigo, tinnitus, or hearing loss and personality traits, psychological suffering, and illness behavior. Psychological suffering does not appear to be influenced by duration of illness. Predisposing factors, such as neurotic and introversion traits, may play a primary role in determining individual susceptibility to psychological suffering in relation to illness. However, denial emerges as a factor associated with less psychological suffering.

The fact that relationships between otologic symptomatology or diagnosis and psychological observations are not specific highlights the role of illness behavior and personality as targets for psychological support or therapy associated with ENT treatment.

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