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MISCELLANEOUS

Patients with long-lasting dizziness: a follow-up after neurotological and psychotherapeutic inpatient treatment after a period of at least 1 year

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Abstract Patients who experience chronic dizziness are considered to be difficult to treat. Persisting symptoms of vertigo can be caused by recurrent organic as well as a variety of psychogenic factors, the latter usually being part of anxiety and depression disorders. Psychotherapeutic interventions can achieve improvements, the effects, however, in general do not persist over a longer time. The purpose of this study is to investigate the long-term effects of a symptom-related indoor treatment including neurotological and psychotherapeutic approaches as well as vestibular and balance rehabilitation. 23 indoor patients 16 male patients and 7 female., mean age 56.6 years (SD 12) with chronic vestibular symptoms (longer than six months), who were treated with neurotological counseling, psychotherapy, vestibular and balance rehabilitation and—if necessary—antidepressant drugs during a lengthy hospital stay [average 40 days (SD 14)], were re-examined. After a time period of at least one year (average 32 months; SD 15) they were asked to answer a questionnaire concerning post-therapeutic status of dizziness, symptoms and coping strategies as well as the Hospital Anxiety and Depression Score (HADS D). 18 of 23 patients (78%) reported a sustained reduction in their vertiginous symptoms. Four patients did not report a persistent improvement and one even got worse. Patients with a chronic form of dizziness can improve through a coordinated neurotologic and psychotherapeutic approach including vestibular and balance rehabilitation.

Keywords Non-vertiginous dizziness · Psychotherapy · Neurotology · Vertigo · Vestibular rehabilitation

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Introduction

Patients suffering from chronic dizziness are looked upon as a multi-faceted challenge, even in the absence of identifiable organic deficits.

Concepts trying to explain and to treat non-vertiginous dizziness are ranging from phobic postural vertigo [1] to visual vertigo syndrome [2], discomfort with space and motion [3] and a failure of readaptation as a basis for chronic subjective dizziness [4], elaborated at large by Staab 2006 [4].

Relevant psychological problems are present in more than one-third of patients with dizziness. The probability of (comorbid) anxiety or depressive disorder increases with recurrent vertigo [4–6]. Therefore, it is to be expected that psychotherapeutic interventions can improve these symptoms. Previous reviews, however, show an initial but not long-lasting effect [7, 8].

This paper reports long-term results of indoor patients with chronic vestibular symptoms at least 1 year after hospitalization, who were treated with intensive neurotological counseling, psychotherapy, vestibular and balance rehabilitation and—if necessary—antidepressant drugs.

The aim is to investigate the development of the Hospital Anxiety and Depression Score (HADS) over time points (beginning of therapy, end of therapy and follow-up at least 1 year later) and whether the two groups differ in their HADS values and in the development of their HADS values over time.

Materials and methods

Between January 2009 and March 2013 76 patients, who experienced chronic dizziness, unsteadiness, sensitivity to motion stimuli, discomfort with open space and varying degrees of anxiety and phobic behaviors were admitted to our indoor treatment. This hospitalized treatment is not uncommon in Germany and is generally financed by the German NHS. The basic elements of inpatient treatment are described in Table 1.

29 patients were excluded from the study, because their symptoms were caused by an accident, and this accident was still an ongoing court case, assuming that the existence of maintaining factors was not susceptible to any form of therapy.

Another 8 patients had to be excluded because of incomplete test diagnostics after treatment.

We sent our questionnaire to 39 patients, 27 of whom replied. Of these, further 3 patients were excluded because they had developed another organic disease with dizziness in the mean time (eye diseases, spinal stenosis). One patient with Meniere's disease improved following intratympanic gentamycin application and was also excluded. The final number was thus $n = 23$.

16 patients were male and 7 female. The mean age was 56.6 years (SD 12) (22–66).

Included patients were divided into two groups depending on their subjective dizziness reported at follow-up and analyzed accordingly. The first group consisted of those patients reporting a lasting improvement and reduction in dizziness ($n = 18$) and the second group containing those patients reporting persistent dizziness ($n = 5$) at the time of follow-up.

Table 1 Basic elements of inpatient treatment

Treatment during hospitalization
1. Repeated individual neurotological counseling at least twice a week
2. Individual and group psychotherapy by the same psychotherapist
3. Daily neurotological counseling and "education" (30 min) in a group of 10 patients without Saturdays and Sundays, containing information about the vestibular system, the connections to the limbic system, the usefulness of vestibular exercises
4. Vestibular and balance exercises, gradual exposure to the individual stimuli, eliciting anxiety and dizziness
5. Daily morning activation (walking alternating with Tai Chi exercises)
6. Progressive muscle relaxation developed as a technique for learning to monitor and control the state of muscular tension, introduced by Jacobsen [9]
7. Keeping a consecutive equilibrium diary
8. Cognitive restructuring of thoughts potentiating dizziness
9. If: necessary: critical discussion about the possible individual function of dizziness, including elements, the patient is not consciously aware of
10. If necessary: Motivation for further outpatient psychotherapy
11. If necessary: Prescription of antidepressant drugs—usually Serotonin Reuptake Inhibitors (SSRI)

Test diagnostics

Hospital Anxiety and Depression Score (HADS D) [10]

The Hospital Anxiety and Depression Score (HADS D) was intended to record the anxiety and depressiveness of patients with physical disease or complaints, which is considered as the most important psychogenic variable in long-lasting dizziness [5, 6]. The anxiety scale (HADS A) includes components of generalized anxiety symptoms and the occurrence of panic attacks. The depression scale (HADS D) addresses the symptoms of anhedonia (loss of interest, joylessness and lack of energy). The anxiety scale has a cutoff at values of clinical relevance of 10/11, the depression scale a cutoff at 8/9 points, with higher scores being considered clinically relevant. The HADS was used at the beginning and end of therapy, and at the time of re-assessment.

Our questionnaire consists of 4 main questions regarding post-therapeutic status of dizziness and symptoms and is attached in the "Appendix".

Statistics

Data were analyzed using two-factorial analysis of variance (ANOVA) with the factors time (begin of therapy, end of therapy and follow-up) and group (reduction of dizziness vs. persistent dizziness), to test for differences in HADS A and HADS D between the different time points and potential interactions with subjective dizziness development. Post hoc tests (Bonferroni-corrected) were used to determine differences between specific time points (end of therapy and 12 months later compared to the status at the beginning of therapy).

Results

Duration of hospitalization and follow-up period

The mean duration of hospitalization was 40 days (SD 14), the average time at the point of follow-up was 35 months (SD 15).

Diagnoses

Initially, we found the following diagnoses:

- Persistent dizziness after vestibular neuritis ($n = 8$), of these, three cases were complicated by additional benign paroxysmal positional vertigo (BPPV), in another three, dizziness had become the main symptom of secondary somatoform dizziness
- Meniere's disease ($n = 8$), two of them bilateral with relevant hearing loss and tinnitus
- Bilateral vestibulopathy ($n = 1$)
- Non-otogenic diseases ($n = 2$): one gastrointestinal disease, which has not been clarified thus far, and one tinnitus patient with benign paroxysmal positional vertigo (BPPV), misdiagnosed as Meniere's disease
- Vestibular migraine ($n = 2$), misdiagnosed as Meniere's disease
- Primary somatoform disorders ($n = 2$), experienced (per definition) somatically by the patient

Subjective dizziness at the time of follow-up ($n = 23$)

18 reported a reduction in dizziness at the time of follow-up.

Four rated their dizziness as unchanged. One patient, whose dizziness had completely abated during hospitalization, experienced dizziness as a worsening with a delay of 1 year after discharge.

Patients with increased scores in the Hospital Anxiety and Depression Score as a presumable sign for psychogenic comorbidity

15 patients scored above 10 on HADS A or above 8 on HADS D"

Hospital Anxiety and Depression Score (HADS) A

Raw values from the test diagnostics HADS A and HADS D for the different time points and groups are displayed in Table 2.

The mean baseline value of the HADS A was 9 (SD = 3.1; $n = 23$), the final value on discharge was 4.8 (SD = 3.2), the mean value after at least 1 year (average 35.2 months) was 4.3 (SD = 3.4) ($n = 23$).

An analysis of variance with repeated measurements using the factors time (before and after treatment and at the time of follow-up) and group (with or without improvement) showed a significant mean effect of the factor time [$F(2, 42) = 19.216$, $p < 0.001$], whereas there was no significant main effect of the factor group [$F(1, 21) = 0.774$, $p = 0.389$] or interaction between the factor time and group membership [$F(2, 42) = 0.891$, $p = 0.418$].

There was a significant difference from the baseline values in HADS A in the post hoc comparison with Bonferroni correction at the time of discharge [mean difference = 4.284, standard deviation (SD) = 0.829; $p < 0.001$) and at the time of follow-up (mean difference = 4.256, SD = 0.846; $p < 0.001$).

Hospital Anxiety and Depression Score (HADS) D

The mean baseline value was 6.6 (SD 3.5) ($n = 23$), the final value at discharge was 3.0 (SD 3.0), the mean sample value after at least 1 year (average 35.2 months) was 3.1 (SD 3.0) ($n = 23$).

An analysis of variance with repeated measurements using the factors time and group showed (similar to the HADS A) a significant main effect of the factor time [$F(2, 42) = 10.831$, $p < 0.001$], a significant effect of the factor group [$F(1, 21) = 4.352$, $p = 0.049$], whereas no significant interaction was found between the factor time and group membership [$F(2, 42) = 1.614$, $p = 0.211$].

There was a significant difference in the post hoc comparison with Bonferroni correction between the baseline values in HADS D and both the time of discharge $p = 0.003$ (mean difference = 3.189, SD = 0.841; $p < 0.001$) and the time of follow-up (mean difference = 2.728, SD = 0.769; $p = .006$)

Dizziness in dependence of HADS results and psychogenic comorbidity

All 8 patients, whose HADS scores remained below the cutoff values, experienced their dizziness as reduced at follow-up.

All 5 patients with unchanged or worsened dizziness scored above the cutoff in the HADS and showed clinically relevant signs of depression or anxiety disorders.

10 of the 15 patients with values above the cutoff in the HADS reported a reduced dizziness at follow-up.

Subjective estimation of factors that was helpful during hospitalization

(Multiple answers were possible, resulting in values greater than 100 %).

The following factors were considered helpful by the patients

Neurotological explanation	21 times
Vestibular and Balance training several times a week	15 times
High-frequency psychotherapy one to one and in group	15 times
Effect of antidepressant drugs (Citalopram and/or Mirtazapin)	4 times

13 patients ticked all three elements of neurotological, psychotherapeutic support, and vestibular and balance training, resulting in cumulative values greater than 100 %.

Table 2 Raw values from the test diagnostics HADS A and HADS D

Dizziness development A: less B: same C:worse	Hospitalization time (days)	Time till Follow-up (months)	HADS A 1	HADS A 2	HADS A 3	HADS D 1	HADS D 2	HADS D 3
A	58	37	0	0	1	0	0	0
A	52	13	8	3	3	2	2	3
A	36	36	7	3	3	7	2	0
A	30	45	9	3	1	2	0	1
A	29	29	6	7	5	3	4	4
A	41	54	6	1	1	3	0	1
A	22	48	8	6	2	4	3	3
A	31	25	10	8	14	4	1	2
A	49	56	10	1	0	5	2	0
A	29	12	8	4	2	6	1	1
A	36	19	8	4	4	8	1	1
A	22	29	8	12	4	8	8	4
A	27	53	11	8	3	9	7	1
A	34	12	12	6	5	9	0	1
A	57	43	15	8	7	10	4	5
A	57	33	11	3	3	12	2	3
A	56	36	12	8	8	15	8	10
B	43	47	11	6	10	6	4	4
B	43	18	9	6	5	8	5	7
B	29	12	10	6	8	8	6	10
B	76	18	13	8	7	8	10	6
C	29	19	5	0	1	8	0	4

HADS A and HADS D, supplemented by hospitalization time and follow-up time point, listed by subjective dizziness development

Dizziness development indicates the group according to the reported subjective dizziness at follow-up

1, Therapy begin; 2, Therapy end; 3, Follow-up time point

Which activities were pursued by the patient following hospitalization?

(Multiple answers were possible, resulting in values greater than 100 %)

Outdoor psychotherapy	9
Vestibular and balance training	16
Progressive muscle relaxation (Jacobsen method [9])	15
Regular medical support	5
No more activities	2

Discussion

Patients with long-lasting dizziness are considered to be difficult to treat. Persisting symptoms of vertigo are often associated with psychogenic comorbidity, usually belonging to the spectrum of anxiety and depression disorders [4–6]. Therefore, psychotherapeutic interventions are considered to be helpful in improving equilibrium, but up to now improvements were only observed during treatment and are not stable in the long-term perspective [7, 8].

Our (indoor) psychotherapeutic treatment is based on intensive neurotological counseling and individual vestibular rehabilitation—after physical and psychological diagnosis—during lengthy hospital stays (40 days). In general, this hospitalization is uncommon and not supported by most national or private medical systems. However, in the German health system it is a possible treatment approach, if it is legitimatized by a marked impairment of occupational and everyday activities and accompanied by relevant avoidance behavior.

Our patients were admitted mostly with ENT diagnoses (17 of 23), their dizziness, however, had lasted longer than it could be explained by persistent organic causes alone.

Similar to the samples of Staab [4] and Eckhardt-Henn [6], we found a high psychogenic comorbidity of about 68 % (15 of 23 = 65 %), which could be screened by the HADS and was confirmed clinically and psychologically. However, in seven of our patients (35 %) depression and anxiety (even by the account of the HADS) remained subclinical. This concurs with Staab's concept of "Chronic subjective dizziness" [4] that there is frequently, but in fact not necessarily, a clinically manifest psychogenic comorbidity in long-lasting dizziness.

With the high intensity of an indoor therapy, it can be expected that patients improve during treatment. Thus, we

found improvements at the end of therapy as reported by Holmberg et al. [8], Edelman et al. [11], Mahoney et al. [12] and in the review by Schmid et al. [7] in the development of HADS, in which 20 out of 23 (87 %) patients improved in HADS A and 18 out of 23 (78 %) in the HADS D.

Likewise, in the post hoc comparison with Bonferroni correction, significant improvement over the baseline values was found in the HADS A and HADS D both at the time of discharge and at follow-up, supporting the assumption, that anxiety and depression had been an important maintaining factor for dizziness.

Additionally and unlike in the survey of Staab [4] and Schmid et al. [7], improvement remained mostly stable (18/23 = 78 %) at least 1 year after discharge.

Our sample consisted mainly of patients with primary peripheral imbalance disorders. Unlike in primarily psychotherapeutic samples many of our patients remained below the category of major depressive and anxiety disorders. This makes the prognosis considerably better [6].

All five patients who could not, despite initial symptom reduction in the HADS, benefit in the long term, presented a manifest anxiety or depressive disorder, which leads in three cases to the classification as primarily somatoform dizziness. Two patients had high organic handicap with recurrent bilateral Meniere's disease and a previous CNS insult, which led to anxious observation and depressive processing.

From our experience, the most important elements for a successful treatment were in accordance with Tschan et al. [13]:

- An exact diagnostics, including physical and psychological aspects
- Repeated neurotological counseling and psychoeducation, in which the concept of failure of readaptation [4] and the understanding of classical and operant conditioning in maintaining dizziness [6, 14, 15] were helpful.
- Psychotherapy with emphasis on cognitive processes and implementation of acting in sensu and situ.
- Vestibular and balance rehabilitation based on the exercises of Cawthorne [16] and Cooksey [17] up to prepared and supported gradual confrontations to individual stimuli provoking dizziness.
- Reflecting and elaborating the functionalization of the dizziness symptoms, in case they are side effects of another underlying problem impeding direct treatment
- If serious anxiety and/or depressive disorders were found, we treated these with additional antidepressant drugs, usually—like Staab [4]—with serotonin reuptake inhibitors (SSRI).
- This therapy was performed by a team of psychotherapeutically qualified neurotologics, clinically oriented psychotherapists and specially trained co-therapists. The concrete procedure could be discussed individually for each patient.

Analyzing the given answers, the interaction of neurotologic and psychotherapeutic competence in synchronization with vestibular and balance rehabilitation was rated as essential for the time during treatment. It appears relevant, that 12 of the 18 (66 %) patients with lasting improvement continued with their therapies, most of them including ambulant psychotherapy.

Also we think, that the sustainable information about differentiation between psychogenic and physical dizziness, and an instruction about—often additionally following—BPPV had prevented many recurrences. This can hardly be provided by psychotherapeutic or psychiatric therapy alone.

Limitations

Our sample consisted mainly of patients with primary peripheral imbalance disorders. Unlike in primarily psychotherapeutic samples many of our patients remained below the category of major depressive and anxiety disorders. This makes the prognosis considerably better [6].

Out of 76 eligible patients, only 23 could be finally included, which could be a possible bias. But to our experience and the concrete results from the HADS, most our patients who developed their symptoms following an accident with ongoing court cases—in total 29—cannot achieve an improvement, even if it seems to be obvious to the examiner. Therefore, the treatment of such patients should be postponed after court decisions are at hand.

Patients, who did not answer the questionnaire or answered incompletely, could be either still suffering from symptoms or could be cured, thus not wanting to make any further effort to be reminded of their disease.

Conclusion

Even in long-lasting dizziness, therapy based on neurotological and psychotherapeutic approaches can be successful in the long term. The psychogenic component probably determines the development of a long-lasting dizziness. The therapy required is extensive and time consuming, but rewarding in a longer perspective.

Appendix

The questionnaire mailed to the patients:

What was most important for you in coping with dizziness?

- Neurotological information:
  - o Have I understood how dizziness arises , yes - no
    Have I understood what maintains my dizziness yes - no
    Have I understood how I can change my dizziness yes - no
- Vestibular and balance rehabilitation:
  - o Have I experienced that my dizziness can be reduced in favor of available or trainable balance capabilities yes - no
- Psychotherapy:
  - o Have I been able to work out factors that led to and/or maintained my dizziness, so that I can imagine or experience what can be changed yes - no
- Medications:
  - o Have the antidepressant drugs contributed essentially to reduce my dizziness yes - no

How did things go on at home:

How was the dizziness?
Did it

- become less? ☐
- stay the same? ☐
- get worse? ☐

What did you continue doing – how long – what do you still do:

- Psychotherapy yes - no
- Vestibular and balance rehabilitation: yes - no
- Progressive muscle relaxation (Jacobsen method) yes - no
- Regular visits to the doctor yes - no
- Have you been in another indoor treatment , if yes, where

Is there anything you would like to tell us in your own words? (space for response)

References

1. Brandt T, Huppert D, Dieterich M (1994) Phobic postural vertigo: a first follow-up. J Neurol 241(4):191–195
2. Bronstein AM (1995) Visual vertigo syndrome: clinical an posturography findings. J Neurol Neurosurg Psychiatry 59(5): 472–476
3. Jacob RG, Woody SR, Clark DB (1993) Discomfort with space and motion: a possible marker of vestibular dysfunction by the situational characteristics questionnaire. J Psychopathol Behav Assess 15(4):299–325
4. Chronic Staab J, Dizziness Subjective (2012) Continuum 18(5):1118–1141
5. Staab J (2006) Assessment and management of psychological problems in the dizzy patient. Continuum 12(4):189–213
6. Eckhardt-Henn A, Tschan R, Best C, Dieterich M (2009) Somatoform syndromes of vertigo. Nervenarzt 80:909–917
7. Schmid G, Henningsen P, Dieterich M, Sattel H, Lahmann C (2011) Psychotherapy in dizziness: a systematic review. J Neurol Neurosurg Psychiatry 82:601–606
8. Holmberg J, Karlberg M, Harlacher U, Magnusson M (2007) One-year follow-up of cognitive behavioral therapy for phobic postural vertigo. J Neurol 254:1189–1192
9. Jacobson E (1938) Progressive relaxation. University of Chicago Press, Chicago
10. Herrmann Ch, Buss U, Snaith RP (1995) HADS-D—Hospital anxiety and depression scale—deutsche version: Ein Fragebogen zur Erfassung von Angst und Depressivität in der somatischen Medizin. Huber, Bern
11. Edelman S, Mahoney AE, Cremer PD (2012) Cognitive behavior therapy for chronic subjective dizziness: a randomized, controlled trial. Am J Otolaryngol 33(4):395–401
12. Mahoney A, Edelman S (2013) Cremer PD Cognitive behavior therapy for chronic subjective dizziness: longer-term gains and predictors of disability. Am J Otolaryngol 34(2):115–120
13. Tschan R, Eckhardt-Henn A, Scheurich V, Best C, Dieterich M, Beutel M (2012) Steadfast–effectiveness of a cognitive-behavioral self-management program for patients with somatoform vertigo and dizziness. Psychother Psychosom Med Psychol 62(3–4):111–119
14. Schaaf H, Holtmann H., Hesse G, Rienhoff N, Kolbe U, Brehmer D (2000) Reactive psychogenic dizziness in Menière's disease. In: Sterkers O, Ferrary E, Daumann R, Sauvage J.P, Tran Ba Huy R (eds) Menière's disease 1999—update. Proceedings of the 4th international Symposium of Menière's disease Paris, France, April 11–14, 1999. Kugler Publikcations, The Hague. pp 505–511
15. Schaaf H, Haid CT (2003) Reactive psychogenic dizziness in Menière's disease. Dtsch Arztebl 13:853–857
16. Cawthorne TE, Friedmann G (1969) Head movement exercises in the therapy of disorders of the equilibrium. Schweiz Med Wochenschr 99:156–158
17. Cooksey FS (1946) Rehabilitation in vestibular injuries. Proc R Soc Med 39:273–278