



Psychological traumatization and adverse life events in patients with organic and functional vestibular symptoms



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ABSTRACT

Objective: . A relationship has frequently been found between a history of traumatization and the existence of somatoform symptoms. The objective of this study was to examine whether this relationship is also observed for functional, i.e. medically not sufficiently explained, vestibular symptoms (FVS). We tested whether patients with FVS and organically explained vestibular symptoms (OVS) differ with regard to frequencies of previous traumatic experiences and posttraumatic stress symptoms. We also explored whether the impact of previous trauma was associated with characteristics of vestibular symptoms and handicap.

Methods: . Patients with a diagnosis of OVS (N = 185) or FVS (N = 158) completed questionnaires about potentially traumatizing experiences (e.g., Childhood Trauma Questionnaire, Impact of Events Scale) and vertigo-related symptoms and handicap (Vertigo Symptom Scale, Vertigo Handicap Questionnaire).

Results: . We found no differences between the two patient groups with regard to number or impact of traumatic life events. However, regression analyses across groups revealed that, regardless of their diagnosis, prior traumatic experiences and the presence of posttraumatic stress symptoms including avoidance and intrusion predicted to some extent higher overall balance symptoms and autonomic symptoms of vertigo-related anxiety.

Conclusion: . Exposure to trauma and symptoms of posttraumatic stress can contribute to symptom severity and handicap experienced by patients with vestibular symptoms irrespective of their original cause, most likely serving as predisposing, modulating or perpetuating factors.

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Introduction

Vestibular symptoms (VS), including vertigo, dizziness, vestibulo-visual and postural symptoms [12] rank among the symptoms most commonly presented to general practitioners and neurologists [47,48]. Up to half of patients presenting with VS in a tertiary care setting suffer from a psychiatric comorbidity which was associated with severe psychosocial impairment [41]. A substantial percentage ranging from 20 to more than 50% of disorders involving vertigo/dizziness as a cardinal symptom cannot be sufficiently explained by an identifiable medical illness and are considered somatoform or functional VS (FVS; [23,41]). Secondary and primary types of FVS can be differentiated based on whether they occur with or without a prior organic vestibular disorder, respectively [19,22]. Those patients are often severely impaired in their professional and daily activities, and their symptoms tend to be chronic [64]. They also report lower health-related quality of life [62] and

experience more severe symptoms and dizziness-related anxiety compared with patients with organic vertigo [11].

Somatoform and functional symptoms, albeit not FVS in particular, have frequently been linked to childhood and lifetime traumatization [4,35,40,63]. Studies of functional somatic syndromes, such as somatization disorder, chronic fatigue, fibromyalgia, and functional gastrointestinal disorders, have consistently found associations with previous trauma [20,30,46,49,54,59]. In their comprehensive review, Roelofs and Spinhoven [52] not only found increased rates of lifetime trauma in patients with medically unexplained symptoms but also an association between trauma and symptom severity. This modulating effect of posttraumatic stress symptoms on somatic symptoms as well as overall functioning and health-related quality of life has been described for different conditions such as conversion disorder, behavioural spells and chronic pain [39,50,53].

Moreover, from the vantage point of traumatization, McFarlane et al. [44] found that patients suffering from posttraumatic stress disorder (PTSD) report more somatic symptoms than non-PTSD subjects. Although somatoform symptoms often appear to be unspecific and involve multiple organ systems [17], Wahlstrom et al. [65] report that pseudoneurological symptoms including dizziness, mental fatigue, clumsiness and headaches are more strongly associated with exposure

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to natural disasters than cardiorespiratory, gastrointestinal, and musculoskeletal symptoms. This finding is in line with that of Sack et al. [54], who found a specific increase in pseudoneurological symptoms (e.g. impaired balance, loss of touch or pain sensations, seizures) in patients reporting any lifetime trauma.

Several overlapping models of the relationship between adverse life events and somatoform symptoms have been proposed. These models suggest contributions of heightened arousal, disordered information processing, and the acquisition of symptom-related mental representations [1,14,44] as well as changes in self-monitoring mechanisms such as those described in a group of patients with fibromyalgia or somatoform pain disorder [34]. Overall, three major models have emerged: dissociation, conversion, and hierarchical cognitive models [52]. The first two models, which are based in psychodynamic theory, attempt to explain the aetiology of somatoform symptoms with psychological trauma serving as a predisposing or precipitating factor. The third model, however, does not describe somatic symptoms in terms of a symbolic representation of underlying dynamics; rather, it stresses the role of attentional processes, specifically an increased awareness of bodily sensations and a recurring allocation of attention to bodily symptoms. It describes mechanisms explaining how previous trauma can contribute to symptoms in a predisposing, modulating or sustaining manner, i.e., how cognitive and behavioural factors might interact with somatic factors to produce or perpetuate symptoms, and could therefore not only be applied to primary functional but also secondary FVS as well as organically explained symptoms.

Despite the well-established association between trauma exposure and somatization, to our knowledge, there are no studies reporting evidence of this association for FVS in particular. However, symptoms of posttraumatic stress including autonomic arousal, anxiety and avoidance behaviours have been reported among patients with vestibular disorders [29,36,70] and an association of PTSD symptoms with anxiety, depression and handicap has been found in patients suffering from Ménière's disease [38].

Therefore, the purpose of the present study was twofold. First, in a tertiary care setting, we compared patients with FVS and organically explained VS (OVS) in terms of their frequency of potentially traumatizing childhood and lifetime experiences and severity of posttraumatic stress symptoms. Second, we explored whether trauma-related variables contributed to the severity of vertigo-related symptoms and anxiety as well as physical and psychosocial handicap across patient groups.

Methods

Study design and sample characteristics

This cross-sectional study was conducted between May 2010 and June 2012. Patients were recruited via routine care appointments at the German Centre for Vertigo and Balance Disorders at the University Hospital Munich, Campus Großhadern. Patients were excluded if they were under 18 years of age or had any neurodegenerative disorders (e.g., dementia), schizoaffective or psychotic disorder, substance abuse, or severe suicidal tendencies. A total of 686 out of 860 eligible patients (80% response rate) gave their consent to participate in the study. Reasons for refusal to participate were insufficient German language skills, lack of interest, difficulty filling out a questionnaire due to cognitive impairment, feelings of excessive demands, or privacy concerns. Due to organizational reasons (e.g. living outside of Munich or vomiting after caloric testing), data could only be obtained from $n = 513$ out of all 686 participants. For the analyses presented herein, patients were included if they had received a definite diagnosis at the time of data collection resulting in a final sample size of $n = 343$. Patients that were excluded from analyses within that step did not differ from included patients with regard to sex distribution or any of the questionnaire-based measures (described below). However, patients that were excluded were significantly younger (included: 56.02(16.476) yrs; excluded:

52.47(15.233) yrs; $t(511) = 2.37$, $p = .018$, 95% CI of mean difference [.604, 6.507]).

This study was part of the Munich Diagnostic and Predictor Study of Somatoform Dizziness, which is described in detail elsewhere [42]. All participants gave written informed consent, and the study was approved by the Ethics Committee of the University of Munich.

Diagnostic assessment

All patients underwent structured collection of their histories and a systematic and standardized physical examination by an expert medical scientist at the German Centre for Vertigo and Balance Disorders, including complete neurological, neurootological, and neuroophthalmological examination. Vestibular testing included the head impulse test, measurements of subjective visual vertical and ocular torsion, and video-oculography with caloric irrigation.

Patients were categorized into the group of (1) organic vestibular symptoms (OVS) if their complaints were related to a defined organic illness based on exam results and established diagnostic criteria for vestibular disorders ([13,18]; frequencies of respective diagnoses are listed in the Results section). If patients' complaints were not medically sufficiently explained by a current vestibular deficit or a defined organic illness, i.e. patients with a non-organic or non-vestibular cause of vestibular symptoms, they were categorized into the group of (2) functional vestibular symptoms (FVS). Patients with former organic vestibular diagnoses that currently did not explain vestibular symptoms, i.e. secondary FVS [19], were also assigned to this group.

Patient self-report questionnaires

A battery of self-report questionnaires, including information on age and sex as key demographic characteristics, was administered to patients.

(1) *Vertigo symptoms and handicap*. Dizziness-related symptoms and resulting physical and psychosocial handicap were assessed using the Vertigo Symptom Scale (VSS; [71]) and Vertigo Handicap Questionnaire (VHQ; [73]).

The VSS ([71]; German version by [61]) assesses the frequency of dizziness-related symptoms through 34 items scored on a 5-point Likert scale ranging from 0 (never) to 4 (more than once a week). Scores for two main dimensions are obtained by summing up item scores for vertigo-balance symptoms (VSS-VER; e.g., dizziness, vertigo, unsteadiness, and light-headedness) and vertigo-induced autonomic-anxiety symptoms (VSS-AA; e.g., somatic sensations, sweating, pounding heart, breathing difficulties, and fainting). The VSS shows good test-retest reliability and construct validity [61,71].

The VHQ ([73]; German version by [62]) assesses physical and psychosocial impairments due to VS. It consists of 25 statements regarding disabling consequences of vertigo scored on a 5-point Likert scale ranging from 0 (never) to 4 (always). The statements address restrictions of physical activity, interferences with social relationships, and fears about vertigo (i.e., the impact of vertigo on quality of life). Item scores are summed to give a total score ranging between 0 and 100 points. Two subscales are derived: 'handicapped activity' (VHQ-ACT) and 'anxiety' (VHQ-ANX). The VHQ has good to acceptable internal consistency, test-retest reliability, and construct validity [62].

(2) *Traumatization*. Traumatization, including the occurrence of childhood trauma and abuse, the experience of other traumatic life events, and the impact and severity of traumatic disorders, was assessed using the Childhood Trauma Questionnaire (CTQ; original version by [8]), Posttraumatic Diagnostic Scale (PDS; [27]; German version by [58]), and Impact of Event Scale (IES; [32]).

The CTQ retrospectively assesses the history of childhood neglect and abuse. The short-form German version ([10]; German version by [68]) used in our study consists of 28 items regarding five types of maltreatment: physical, sexual, and emotional abuse as well as physical

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