

Anxiety Symptoms in Spouses of Stroke Patients

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Key Words

Anxiety · Stroke · Spouses · Longitudinal

Abstract

Background: The aim of this longitudinal study was to investigate prevalence rates of anxiety symptoms in stroke patients' spouses and associated factors. **Methods:** Data were collected from 114 couples upon the patients' admission for rehabilitation as well as 1 year later and analysed with linear regression analyses. The Beck Anxiety Inventory was used to assess anxiety symptoms. **Results:** The results showed a high prevalence of anxiety symptoms at both time points of 28.9 and 27.6%. An association was found between spouses' anxiety symptoms at both time points and their gender as well as spouses' anxiety symptoms (at time 2) and patients' perceived disability. **Conclusions:** Post-stroke rehabilitation process should include a focus on treating anxiety symptoms in patients' spouses in order to prevent the development of stress-related disorders in this group.

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Introduction

Several studies have indicated that severe health impairments such as depression occur in 11–42% of caregiving spouses of stroke survivors [1, 2]. A corresponding decline in quality of life has also been noted [3–5]. Although studies reported an increase in anxiety in 43% of spouses following stroke [6, 7] and that about half of the

caregivers reported anxiety about the possible occurrence of a second stroke [8, 9], leaving the patient unattended [9] and being left alone [10], investigations of spouses' anxiety symptoms have been widely neglected. There are 3 longitudinal studies in which caregivers' anxiety symptoms have been examined [6, 11, 12]. Anxiety symptoms, however, did not comprise the primary focus of these studies. As a result, they provide neither information about prevalence rates, comparisons with the general population, nor significant information about predictors of anxiety symptoms. Only 4 cross-sectional studies have addressed this issue and each of them has reported a high percentage of anxiety symptoms in caregivers (37–58%) [9, 10, 13, 14]. The few findings of the existing studies regarding related factors of anxiety were as follows. Dennis et al. [13] found no associations between anxiety and caregivers' age, patients' level of dependency and severity of stroke. There were also no relations shown between spouses' level of anxiety and patients' degree of disability, cognitive impairment and abnormal behaviour in the study by Anderson et al. [9], and even in the study of Smith et al. [14], no relations between patients' level of disability were found. McCullagh et al. [11] reported an association between burden of care, quality of life and anxiety both 3 and 12 months following stroke and Smith et al. [14] reported an association between more hours spent caring and anxiety symptoms 1 year after stroke. The studies were inconsistent concerning gender. Women scored higher than men on anxiety symptoms at a 6-month follow-up in the study of Dennis et al. [13]. In contrast, the study by Beach et al. [12] reported no gender differences.

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A mixed caregiver sample was examined (coronary heart disease and stroke) in the study by Beach et al. [12], but no differentiation was made between spouses of stroke patients and those of heart disease patients in the results. One-year post-stroke anxiety symptoms were associated with anxiety symptoms at baseline, life events, spouses' (instrumental) activities of daily living difficulties and burden of care at the baseline measurement. Increases in burden of care and spouses' (instrumental) activities of daily living difficulties were associated with increased levels of anxiety symptoms, whereas the more help caregivers received the less they suffered from anxiety symptoms.

The aim of this study was to improve knowledge about the prevalence of and changes in spouses' anxiety symptoms over time and factors associated with anxiety symptoms such as spouses' age and gender, and patients' depression and degree of dependency.

Based on the few findings described below, we suspect that the prevalence of anxiety symptoms is higher in this group than in the general population [9, 10, 13, 14]. Because of the inconsistency of previous findings, no hypotheses could be formulated about associations between spouses' gender and patients' degree of depression and dependence in daily activities.

Methods

Subjects

This longitudinal study was approved by the ethical committee of the University of Leipzig and conducted from 2001 to 2004. The following inclusion criteria were used: first completed stroke (subarachnoid haemorrhages were excluded); no evidence of known coexisting malignant or other rapidly progressive medical diseases; patient returned home; patient and partner living together.

In the process of collecting data, all currently existing (inpatient and day clinic) specialized neurological rehabilitation facilities in Leipzig and Halle (Germany) were included in the study to reach a representative study sample. The sample can be characterized as being representative in terms of distribution of gender and severity of stroke. However, because the focus of the study and the participating clinics was on work rehabilitation, all patients older than 85 were excluded and the mean age of the participating patients was younger than in a community sample of stroke patients. Approximately 40% of the admitted stroke patients did not fulfil the selection criteria. Main reasons for exclusion were: no spouse/or did not live together, other diagnoses, repeated stroke, additional coexisting severe disease or planned transfer to institutional care. One hundred and eighty-five stroke patient/spouse dyads fulfilled the inclusion criteria and 151 of them provided written informed consent.

The patient/spouse dyads were interviewed on admission (mean 2.6 months after stroke, SD 1.9) and 12 months later. All measurements were taken in face-to-face interviews administered by trained psychologists.

Measures

The Beck Anxiety Inventory (BAI) [15] was used to assess spouses' anxiety symptoms because of its capacity to distinguish between anxiety symptoms and depression. The divergent validity has been tested and supported in several studies [16]. In the sample of this study a moderate correlation with the Beck Depression Inventory ($r = 0.42$) was found. The questionnaire consists of 21 items, whereby sum scores with a cut-off value ≥ 11 points indicate anxiety symptoms of clinical significance [17]. Gillis et al. [18] found the average BAI score for a non-clinical sample of adults to be 7.3, comparable to the study done by Morin et al. [19] with 6.5 in a sample of 281 older adults.

The measurements of impairment due to stroke were done with the Barthel Index (scoring from 5 to 100) [20] and the Patient Competency Rating Scale (PCRS, patient self-rating version) [21], a version modified for use with stroke patients [22]. Patients' depression was measured with the Cornell Depression Scale (CDS), an observer rating instrument specifically designed for patients with cerebral dysfunctions [23]. Spouses' rating was used in this study. Herrmann et al. [24] successfully used the CDS for stroke patients. Good results in terms of both reliability (Cronbach's α 0.77) and validity (high correspondence of 86.6% with DSM-III diagnoses) proved that the instrument is well suited for the assessment of post-stroke depression [24]. As far as the validity of patients' relatives' assessments is concerned, several studies suggest that clinicians' diagnoses correspond much more highly with patients' relatives' reports about patients than they do with the patients' reports about themselves [25]. The hypothesis that higher ratings of depression by caregivers reflect projection of their own depression could not be supported. Studies found no significant correlation between the caregivers' depression and the rating of patients' depression with the CDS [26].

Statistical Analyses

The t test was used to compare anxiety symptoms at both time points. Linear regression analysis (simultaneous entry method) was used to investigate associated factors. Sex and age of the spouses, baseline score of anxiety symptoms, depression of the patients, physician-rated Barthel Index and functional ability (PCRS) were used as predictors. Anxiety symptoms of the spouses served as the criterion variable.

Results

Subjects

The BAI was completed by 145 of the total sample ($n = 151$) of spouses on admission. One year later, 78.8% of the spouses agreed to continue participating in the study; of these, 114 completed the BAI. Therefore, the study sample consisted of 114 spouse/patient dyads. In a time 1 comparison made between the sample with complete data sets and the spouses who refused participation at time 2, no statistical differences were found regarding the used predictor and outcome variables.

The average age of the spouses was 58 years (range 26–82, SD 11.4). The mean age of the patients was 60 years

Table 1. Descriptive statistics of anxiety symptoms

Beck Anxiety Scale	Measuring time 1		Measuring time 2	
	mean	SD	mean	SD
Whole sample (n = 114)	8.8	7.5	8.3	8.5
Women (n = 82)	9.7	7.4	9.3	8.6
Men (n = 32)	6.4	7.5	5.7	7.6
Severity	Prevalence	n	Prevalence	n
Cut-off score ≥ 11	28.9%	33	27.6%	31
Cut-off score ≥ 18	14%	16	15.8%	18

Table 2. Linear regression analyses on spouses' anxiety symptoms

Predictor variable at time 1	Anxiety/T1 β	Anxiety/T2 β	Anxiety/ change score, β
Sex (spouse)	-0.41***	-0.26*	-0.28*
Age (spouse)	0.07	0.16	0.16
Anxiety		0.48***	-0.57***
Depression of patients	0.08	-0.09	-0.09
Patient's dependency in everyday life	0.10	-0.38*	-0.38*
Barthel Index	0.10	0.11	0.11
Adjusted R ²	0.11	0.36	0.34

β = Standardized β -coefficient. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

(range 30–83, SD 10.6). Seventy-two percent of the spouses were women. Most partnerships had, on average, extended over a period of 32 years (range 2–58, SD 13.8).

There were 90 patients with an ischaemic brain infarction and 24 with intracerebral bleeding (60 left hemisphere, 44 right hemisphere, 5 bilateral, 5 not assessable; no patients with cerebellar or brainstem lesions). Most patients (63.2%, $n = 72$) displayed severe functional impairment on admission (Barthel Index < 85 ; mean 56.9, range 5–100, SD 33.6).

Spouses' Anxiety Symptoms

Similar prevalence rates and average sum scores of anxiety symptoms were found at both measurements (table 1). Fourteen percent of the sample scored 18 points or more on the BAI scale at time 1 (severe anxiety), 15.8% at time 2. More women reported symptoms of severe anxiety at both time points. At the first time point, 75% of spouses with severe anxiety symptoms were women and at time 2 the percentage of women with severe anxiety symptoms was 83.3%.

Associations between Patients' and Spouses' Characteristics and Spouses' Anxiety Symptoms

Gender was significantly associated with anxiety symptoms observed in the spouses at time 1 and 2 ($\beta = -0.41$ and -0.26 , respectively; table 2). The proportion of anxiety symptoms in women was much higher (78.8%) than in men (21.2%), and women complained of a greater degree of anxiety symptoms (mean 9.7) than men (mean 6.4). The mean level of anxiety symptoms after 1 year was 9.3 for women and 5.7 for men.

Patients' disability was associated with anxiety symptoms observed in the spouses at time 2 ($\beta = -0.38$; table 2). The mean level of anxiety symptoms at time 1 was 9.6 for spouses of patients with severe impairment (PCRS ≤ 75) and 4.5 for spouses of patients with light impairment (PCRS ≥ 75). Additionally, the level of anxiety symptoms on admission was associated with anxiety symptoms 1 year later ($\beta = 0.48$; table 2). No associations could be shown between anxiety symptoms and the Barthel Index, although a moderate correlation between PCRS and Barthel Index ($r = 0.54$) was shown.

Factors Related to Changes in Anxiety Symptoms

Spouses' changes in anxiety symptoms between time 1 and 2 were associated with spouses' initial levels of anxiety symptoms, their gender and patients' dependency in everyday activities (table 2). Patients' depression and spouses' age and Barthel Index upon hospital admission were not associated with changes in spouses' anxiety symptoms.

Increase in anxiety symptoms was associated with higher levels of anxiety symptoms ($\beta = 0.57$), higher dependency of patients on admission ($\beta = -0.38$), and female gender ($\beta = -0.28$). Male spouses, spouses with no or few anxiety symptoms at baseline or spouses of patients with low dependency on admission were less likely to increase or develop anxiety symptoms 1 year later (table 2).

Discussion

The results of this study showed that anxiety symptoms were common in nearly a third of the spouses. Correspondingly, the number of stroke patients' spouses who are above the cut-off score of anxiety symptoms in a clinical range was quite high in comparison to the general population [18]. Fourteen percent of the spouses on admission and 15.8% one year later were above the cut-off score of 18, indicating severe symptomatology of anxiety; a noticeably higher percentage than in the general population [17].

In line with the results of Beach et al. [12], significant positive associations were found between the spouses' baseline level of anxiety symptoms and anxiety symptoms 1 year later. Additionally, an increase in anxiety symptoms was associated with higher anxiety symptoms at baseline. Furthermore, spouses' gender was significantly associated with their anxiety symptoms both at time 1 and 2 as well as with changes over time. The observation that women appear to be more prone to anxiety was consistent with the study by Dennis et al. [13] and with the distribution of anxiety symptoms in the general population [17]. Additionally, patient's disability in everyday life showed to be a significant predictor of spouses' anxiety symptoms 1 year after stroke as well as for changes in their anxiety symptoms over time. Even Beach et al. [12] indicated that patients' disability was a predictor of spouses' anxiety symptoms. As was also seen in the cross-sectional studies [9, 13, 14], no significant associations with patient-related variables were found at the first measurement and no relation between spouses' anxiety

symptoms and age or patients' depression was found at any time point. Accordingly, no associations could be found between the Barthel Index and the anxiety symptoms of the spouses. One possible explanation is that the Barthel Index only gives a rough estimate of the extent of motor impairments, whereas PCRS captures various domains such as cognitive, emotional and social disabilities.

Although the presented study improves our knowledge about anxiety symptoms in spouses of stroke patients, it is also limited in several aspects. First, the history of spouses' anxiety disorders was not assessed, resulting in the exclusion of this possibly important predictor from the analyses. Lack of previous history with psychiatric disorders and current psychotherapeutic treatment was, however, a criteria for inclusion in the study. Second, with the absence of a control group of spouses of patients with other disabling diseases, it cannot be determined if the anxiety symptoms were related to disabilities in daily life, which also occur in other chronic diseases, or if they are specifically related to stroke. Third, because the Beck Anxiety Scale was used but structured clinical interviews were not conducted, anxiety symptoms could be assessed but the presence of anxiety disorders could not.

The high prevalence of anxiety symptoms at both time points strongly indicates that specific interventions for this group at risk are needed. Further research into the consequences of spouses' anxiety symptoms on the rehabilitation outcome of the patient is recommended to prove the early findings reported by Evans and Baldwin [27] that anxiety symptoms of caregivers are a significant predictor of patients' adjustment after stroke.

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