


Anxiety and Depression Are Not Related to Increasing Levels of Burden and Stress in Caregivers of Patients With Alzheimer's Disease

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Abstract

Sixty-nine dyads of patients with Alzheimer's disease and primary caregivers have been followed up for 1 year to evaluate cognitive (Mini-Mental State Examination), functional (Instrumental Activities of Daily Living), and behavioral (Neuropsychiatric Inventory) decline of patient in relation to burden (Caregiver Burden Inventory), stress (Relative Stress Scale), anxiety (State-Trait Anxiety Inventory Y), and depression (Beck Depression Inventory) reported by the caregivers. After 1 year of observation, cognitive and functional scores worsened while behavioral problems remained unchanged and relatively mild in patients. After 1 year, caregivers' scores of scales of anxiety and depression decreased significantly, while stress scores remained unchanged and burden slightly increased. In our opinion, the unexpected improvement in psychological situation of caregivers may be mainly due to educational interventions focused on knowledge of the disease with a particular attention directed toward emotional support and individual needs.

Keywords

Alzheimer's disease, caregivers, stress, anxiety, depression

Introduction

Alzheimer's disease (AD) is the main form of dementia in the elderly individuals, and its prevalence is expected to increase with the lengthening of life expectancy. According to estimates from The World Alzheimer Report 2015, 46.8 million people worldwide have dementia, mainly of the Alzheimer's type, and this number is expected to increase to 74.7 million by 2030 and 131.5 million by 2050.^{1,2}

It is often said that AD is a progressive and relentless disease affecting the patient and at least 1 caregiver (the "hidden victim"³). In Italy, 80% of patients with AD are assisted at home by family or professional caregivers, usually women.⁴

As a consequence, a great number of caregivers will suffer from somatic, psychological, and economical effects of the disease of their assisted. It is well-documented that psychological distress of caregivers increases the risk of somatic morbidity, cardiovascular diseases, and cancer and increases the risk of mortality in a dose-response relationship.⁵

Dementia caregivers were found to perform worse on cognitive executive tasks in comparison to noncaregivers,⁶ although this has not been universally reported.⁷

A recent literature review⁸ failed to provide evidence that pharmacological treatment of cognitive or behavioral symptoms of patients with AD could relieve the burden and stress of caregivers.

Clinically significant anxiety affects approximately a quarter of caregivers, and depression affects 10% of them^{9,10} in a direct positive relationship with severity and duration of dementia.¹¹

In a recent report⁴ of Italian caregivers of patients with AD, 30% took antidepressants and 29% took sedatives or hypnotics, mainly benzodiazepines.

Joling et al¹² reported that suicidal thoughts are present in dementia caregivers and can persist across the care trajectory.

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However, no conclusive evidence for factors predicting or associated with anxiety disorders has been found based on a literature review because anxiety and depression are most likely associated with the personal features of both patients and caregivers, such as increased age and lower education levels.¹³

Isik et al¹⁴ identified as predictors of increased burden the factors of being a woman, a spouse, and an older adult with social isolation and poor knowledge about dementia. In different cultural situations, emotional and physical problems of the caregivers, as well as the time spent in the care, intensify the burden.¹⁵

A recent systematic critical review showed that caregiving in dementia might potentially show positive aspects in terms of personal growth, accomplishment, and gratification.¹⁶ In our clinical observations, we found caregivers' higher levels of anxiety and depression in the early phases of the disease than when the patients had increased loss of autonomy and cognitive decline.

This observation was supported by a 2-year longitudinal study showing that the burden of caregivers remained stable, and severe depression decreased along with the cognitive, functional, and behavioral worsening of the patients.¹⁷

We aimed to follow for 1 year dyads of patients with AD/family caregivers selected in clinical case series during the early-middle stages of the disease to evaluate the relationships between anxiety and depression and the burden of caregivers with cognitive, behavioral, and functional deterioration in the patients. Early literature on these topics were not focused on AD dyads,^{12,14,15} were not prospective,^{11,12} or were obtained by systematic reviews.^{10,17} Our study seems unique in the prospective evaluation of the cognitive and functional decline in patients with AD and the consequences on anxiety and depression of their primary caregivers.

Patients and Method

We recruited the dyads in a clinical consecutive series of patients who had a diagnosis of AD according to standard research criteria¹⁸ for at least 6 months. In all the dyads, the caregiver lived in the same household or had at least daily 8-hour contact with the patients and were able to provide full and reliable information. Both patients and caregivers included in the study had generally good physical health and mobility. General healthy status was documented by the clinical assessments in patients and was self-reported in caregivers. Patients and caregivers gave verbal informed consent for the collection of data, after approval by the local ethics committee.

The dyads of patients and caregivers were administered at baseline and after approximately 1 year.

The scales and tests were as follows:

- *Patients*: Mini-Mental State Examination (MMSE)¹⁹ for cognitive assessment; Instrumental Activities of Daily Living (IADL)²⁰; and Neuropsychiatry Inventory (NPI)²¹ for the evaluation of behavioral and psychological symptoms of dementia (BPSD).
- *Caregivers*: Relative Stress Scale (RSS)²²; Beck Depression Inventory (BDI)²³; NPI subitem "stress"²¹;

State-Trait Anxiety Inventory Y (STAI-Y)²⁴; and Caregiver Burden Inventory (CBI).²⁵

Ranges of the scales are as follows: MMSE: 30 (no cognitive deficit) to 0 (maximal cognitive deterioration); IADL: 0 (totally independent) to 23 (totally dependent); NPI total: 0 (no BPSD) to 144 (maximal BPSD); RSS: 0 (no stress) to 60 (maximal stress); NPI subitem "stress": 0 (no stress) to 60 (maximal stress); STAI-Y: 20 (no anxiety) to 80 (maximal anxiety; >60 severe anxiety); BDI: 0 (no depression) to 63 (maximal depression; >30 severe depression); CBI: 0 (no burden) to 96 (maximal burden).

Scales were administered on paper to caregivers by 2 expert neuropsychologists (S.D. and C.M.) and results of tests administered to patients by other 2 expert neuropsychologists (T.T. and R.M.).

Chronic (ie, dating from at least 1 month before the baseline) *drug therapies*, for both the patients and caregivers, were recorded at baseline and after 1 year. Benzodiazepines, neuroleptics, and hypnotics were categorized as "sedatives," while "antidepressants" were always selective or nonselective serotonin inhibitors.

During the year of follow-up, the patients were not treated with nonpharmacological therapies (ie, reality-oriented therapy, art therapy, or other) nor were they admitted to a long-care facility.

As a general rule, information support had been offered to all caregivers. Statistical analyses were performed using Statistical Package for the Social Sciences, version 20 (SPSS 2012; SPSS Inc, Chicago, Illinois). After confirmation of the normality of the data using the Kolmogorov-Smirnov test, analysis of variance with repeated measures was used to compare the scores of scales for the patients and caregivers at baseline and after 1 year.

Results

A total of 69 dyads of patients and caregivers were prospectively selected and followed up after 1 year. The demographic and clinical features of the enrolled patients and caregivers are shown in Table 1. Table 2 shows the results of scales administered to patients and caregivers at baseline and after 1 year, with the statistical analysis.

For 9 of the 69 patients, it was not possible to obtain a reliable MMSE score at baseline because the Montreal Cognitive Assessment or other screening tests were used. This lack appeared to not be influential on the assessment of objective cognitive deficits.

At baseline, 63 (91.3%) patients were on chronic anticholinesterase inhibitor (AChEI) therapy and 14 (20.2%) patients were on sedative therapy. At baseline, 9 (13%) caregivers took sedatives and 3 (4.3%) took antidepressant therapies.

As expected, after 1 year, the patients showed a significant impairment in cognitive (MMSE) and functional (IADL) abilities, while BPSD (NPI total) did not significantly change. After 1 year, 50 (72%) patients remained on AChEI and 19 (27.5%) patients remained on sedative therapy. In this period, no hospitalization or significant pathological events occurred with the patients or the caregivers.

Table 1. Demographic and Clinical Features of Patients and Caregivers.

	Caregivers	Patients
N (male/female)	69 (16/53)	69 (28/41)
Age, mean \pm SD	59 (12)	76.1 (6.1)
Children	52%	na
Spouse	46%	na
Duration of disease, months, mean \pm SD	na	59.8 (30.2)
Psychotropic drugs		
At baseline		
Sedatives	13%	20.1%
Antidepressant	4.3%	0
AchEI	0	91.3%
After 1 year		
Sedatives	15.9%	27.5%
Antidepressant	7.2%	0
AchEI	0	72%

Abbreviations: AchEI, anticholinesterase inhibitor; na, not available; SD, standard deviation.

Table 2. Results of Scales Administered to Caregivers and Patients at Baseline (T0) and After 1 Year (T1) With Statistical Analysis.

	Caregivers			Patients		
	T0	T1	P	T0	T1	P
MMSE ^a	na	na		15.7 (5.7) ^b	12.9 (5.6)	.05
IADL	na	na		15.3 (6.5)	18.1 (5.6)	.05
NPI TOT	na	na		19.5 (17.5)	19.3 (15.9)	ns
RSS	23.2 (12.4)	22.6 (12.3)	ns	na	na	
STAI-Y	43.5 (10.6)	22.5 (20.1)	.05	na	na	
BDI	10.1 (7.9)	7.3 (6.7)	.05	na	na	
CBI	28.9 (18.2)	38.7 (14.5)	.05	na	na	
NPI stress	10.5 (8.5)	7.5 (9.4)	ns	na	na	

Abbreviations: BDI, Beck Depression Inventory; BPSD, behavioral and psychological symptoms of dementia; CBI, Caregiver Burden Inventory; IADL, Instrumental Activities of Daily Living; MMSE, Mini-Mental State Examination; na, not available; NPI, Neuropsychiatry Inventory; ns, not significant; RSS, Relative Stress Scale; STAI-Y, State-Trait Anxiety Inventory Y.

^aScores corrected for age and education.

^bData from 60/69 patients.

After 1 year, the caregivers reported no or minimal changes in their stress scores on the RSS and NPI subitem stress, with a significant increase in the burden level (CBI). In contrast, there was a significant reduction in anxiety (STAI-Y) and depression (BDI) scores in the caregivers. After 1 year, 15.9% and 7.2% of caregivers took sedatives or antidepressants, respectively.

Discussion

Our results suggested that the cognitive progression associated with AD, as measured with the MMSE, was not halted by AchEIs, as almost all patients were taking these medications. Thirteen patients stopped this treatment due to severe cognitive worsening. In contrast, in the year of observation, there was no significant worsening in the BPSD, as measured with the NPI

total score, and only 5 patients initiated sedative therapy in the period of observation.

The burden of caregivers in the year of observation significantly increased, while their stress remained almost unchanged. The BPSD is often thought to determine caregivers' stress and burden as well as the hospitalization of the patients in long-term facilities, but this was not the case in our patients.

Notwithstanding the increased levels of burden and unchanged levels of stress, our caregivers complained of less anxiety and less depression at the end of the year of observation. This does not agree with previous papers reporting that increased levels of burden and stress induced increased levels of anxiety^{10,11} and depression.^{11,12}

In contrast, our findings confirmed a previous study¹⁴ showing a decrease in depression after a follow-up of 2 years, while the burden remained stable. To explain these unexpected findings, this study emphasized the role of the personalities of patients, caregivers, and their social relationships; however, alternative explanations are possible.

Being aware of the characteristics of AD, in our center, a full information program about the disease, its behavioral consequences, and relevant coping strategies is routinely offered to all caregivers after the first diagnosis of AD.

Caregivers tend to attribute to the patients a purposeful control over the cognitive deficits and behavioral disorders and cannot explain the change in the lives of their beloved.²⁶ Educational interventions focused on knowledge of the disease with particular attention directed toward emotional support and individual needs enable caregivers to be more confident in their own capabilities, thereby anticipating and avoiding stressful situations. Therefore, it is probable that BPSD remained unchanged in these patients due to the adequate coping and a comprehension of the behavioral difficulties by their caregivers.

Moreover, there could have been some affective and emotional disinvestment of the caregivers that was protective for their own mental health. Dupuis²⁷ described 3 sequential phases of grief for the loss of the patient with dementia: "anticipatory," "progressive," and "acknowledged," characterized by avoidance and acceptance as coping strategies.

Our baseline assessments seemed to correspond to the anticipatory and progressive phases, and after 1 year, there was a correspondence to the acknowledged phase. If reduced depression and anxiety levels could be explained as a positive response to bereavement, in the sense of acceptance of the losses that caring for a demented loved one involves, increasing burden and decreased emotional health have been found to be associated with increased grief.²⁸ The unexpected dissociation between burden/stress and anxiety/depression cannot be attributed to specific pharmacological therapies because in the course of the follow-up, only 4 of 69 caregivers initiated sedative or antidepressant therapies.

This study has some limitations: the possible selection bias of the patient-caregiver dyads, the relatively small size of the sample studied, and the neglect of social and environmental

factors that potentially influenced the relationship between the patient and the caregiver dyad.

For example, it is known that different grieving²⁹ and stress³⁰ patterns exist in adult children compared to spouses, also in relation to gender, education, age, and physical health.

Our population was too small to conduct any statistical analysis of these variables, but we do not feel that gender or social characteristics of the caregivers can explain our findings.

In conclusion, our findings confirm that the follow-up with caregivers allowed us to observe improvements regarding psychological discomfort, notwithstanding the increase in burden and unchanged levels of stress. Rather than drug treatments, these alterations seemed to be due to normal psychological reactions, reinforced by information and emotional support.

The coping strategies of caregivers have been increasingly recognized as a paramount need for their own mental and physical health and potentially in an attenuation of the cognitive and functional decline in patients with dementia.


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