

Does Losing a Spouse to Dementia Affect Mental Health Earlier than Other Causes of Death? Antidepressant Use Surrounding Widowhood

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ABSTRACT

Widowhood is associated with an elevated risk of death. However, a previous study revealed that if a spouse dies from Alzheimer's or Parkinson's disease, widowhood has no adverse effect on the surviving spouse's risk of death. Alzheimer's disease and other types of dementia may affect the surviving spouse's health already before widowhood. We analyzed changes in the three-month prevalence of antidepressant use for three years before and three years after widowhood, depending on whether a spouse died of dementia or of other causes. The study employed register-based data of 41,855 widowed individuals and repeated-measures logistic regression analyses. The findings showed an excess prevalence of antidepressant use 3-27 months before widowhood among women whose spouses died of dementia, relative to women whose spouses died of other causes. The excess prevalence disappeared after widowhood. The findings suggest that changes in mental health occur before widowhood for those whose spouses die of dementia.

Introduction

It has been suggested that the experience of grief after widowhood is both uniquely personal and universal (Lichtenberg 2017). This is reflected in most mortality studies reporting an elevated risk of death after widowhood. The elevated risk of death is not related to certain specific causes of death but rather to most of them, reflecting a major crisis of overall wellbeing after widowhood. However, a study from the United States showed that if a spouse dies from Alzheimer's or Parkinson's disease, widowhood has no adverse effect on the surviving spouse's risk of death (Elwert and Christakis 2008). It has been suggested that the burden of caregiving can be especially heavy prior to the death of a spouse with dementia, and final widowhood itself therefore causes no deterioration of health for the surviving spouse.

The surviving spouse may also experience the emotional loss of a partner to dementia long before physical death occurs. This type of anticipatory grief is often called dementia grief, and caregivers and family members often experience it (Blandin and Pepin 2015). The grief is characterized by liminality, in which a person with dementia is physically there but his or her reasoning and personality have begun to change, and therefore, he or she is less present than before. These profound behavioral changes are likely to affect the quality of all relationships and may lead to increases in depressive symptoms among caregiving family members.

Although it is widely acknowledged that a decline in memory and other cognitive functions that comes with dementia have a wide-ranging impact on families and health care systems (Hurd et al. 2013; Plassman et al. 2007), little evidence is available on whether individuals who lose their spouses to dementia experience depressive symptoms before widowhood more often than do those whose spouses die of other causes. Using longitudinal data of more than 40,000 widowed individuals, we analyzed changes in antidepressant use for three

years before and three years after widowhood, depending on whether a spouse died of dementia or of other causes between 1998 and 2007. The analyses were performed separately for men and women because the genders may experience dementia grief differently.

Data

Register-based data

The data were based on a 14 % sample of individuals aged 40 and over resident in Finland on December 31, 1997. These individuals were linked with the members of their households by Statistics Finland and with information from medication register provided by the Social Insurance Institution. We restricted the data to married couples aged 40 and over who lived together at the time of study entry in 1997 and were residents in Finland in 1995. Of these 389,934 married persons, 11% widowed between January 1, 1998 and December 31, 2007. We further excluded 866 widowed individuals who were registered to have left the household population before widowhood. The decision was based on the fact that individuals who no longer live in private households are likely to get medication from the institution they are living in. Of the remaining 41,855 widowing individuals in our analytical sample, 9.1 % lost their spouse attributable to Alzheimer's disease or other types of dementia and 90.9% attributable to other causes of death.

Assessment of a spouse's cause of death

Study persons (N = 41,855) were followed for a spouse's date and cause of death from January 1, 1998 to December 31, 2007. The causes of death were categorized according to the 10th revision of the International Classification of Diseases by Statistics Finland (Stakes 1999). A widowed person was categorized into having lost a spouse to dementia if a spouse's underlying cause of

death or any of the three contributory causes were Alzheimer's disease or other types of dementia (F01, F03, G30, and R54) (Statistics Finland 2003). Other widowed persons were categorized to have lost their spouses to other causes of death.

Assessment of antidepressant use

The data on antidepressant purchases from 1995 to 2007 were based on the prescription register maintained by the Social Insurance Institution. The prescription register provides information on the dates of drug purchases and employs the Anatomical Therapeutic Chemical Classification to categorize various types of medication. We included purchases of antidepressants (Anatomical Therapeutic Chemical code: N06A) and purchases of antidepressants in combination with psycholeptics (code: N06CA01) in our study. The prescription register has previously been used to study mental health trajectories surrounding retirement (Oksanen et al. 2011) and divorce (Metsa-Simola and Martikainen 2013).

Methods

Statistical method

Having the exact dates of antidepressant purchases and widowhood, we were able to create a centered data set around the date of death of a spouse. We determined antidepressant purchases for each three-month (91-day) period surrounding widowhood, and followed the study persons for three years before and three years after a spouse's death.

We employed repeated-measures logistic regression analysis with an outcome of 1 if a study person had bought antidepressants during a three-month observation period and 0 otherwise. Using generalized estimation equations with an unstructured correlation matrix,

logistic regression analysis controlled for correlations within individuals (Lipsitz et al. 1994; Twisk 2003). Study persons were censored in an observation period, in which they died, emigrated or otherwise left the household population. Information on death was available on daily basis and that on emigration and household status at the end of each year.

The results from logistic regression analysis are displayed as three-month prevalence estimates. All analyses were stratified by sex, except for the first analysis, in which changes in the male and female prevalence estimates were obtained from the same statistical model (Figure 1).

Control variables

The three-month prevalence estimates for antidepressant use were controlled for time-varying covariates for calendar year, age, and age squared and for a time-invariant covariate for education. Calendar year was controlled for in order to correct for the increasing trend in antidepressant use. It was divided into one-year categories and added into the statistical models as separate dummies. Age and age squared were used as continuous variables. Education was categorized into three groups according to the highest educational qualification or degree completed: tertiary education, intermediate education, and basic education or less.

Results

Figure 1 displays adjusted three-month prevalence estimates of antidepressant use for men and women surrounding widowhood, regardless of a spouse's cause of death. The results show increases in antidepressant use for both men and women immediately following a spouse's death.

Women have higher prevalence estimates than men during the entire observation period (Figure 1).

Figures 2 and 3 display prevalence estimates of antidepressant use around widowhood for women and men according to a spouse's cause of death (dementia vs. non-dementia death). The findings show that the prevalence of antidepressant use is relatively similar among women whose spouses die of dementia than among women whose spouses die of other causes at the study entry 36 to 33 months before spousal death. The excess prevalence attendant with dementia-related widowhood is observed from 27 to 3 months before widowhood. However, the excess appears to level off after a husband with dementia has died. This is because other widows, whose husbands die of non-dementia causes experience a large increase in antidepressant use immediately following widowhood.

The results for men are relatively similar, although statically non-significant. Had we used 6-month (182 day) observation periods the male results would have been significant before dementia-related widowhood as well.

Discussion

We analyzed antidepressant use for three years before and three years after the death of a spouse, depending on whether a spouse died of dementia or of other causes of death. Our findings confirm an increasing effect of widowhood on antidepressant use following spousal death. This finding is similar to previous studies reporting increases in the likelihood of depression at the time of widowhood (Siflinger 2016) and increases in mortality risk after widowhood (Elwert and Christakis 2006; Jagger and Sutton 1991; Manor and Eisenbach 2003; Martikainen and

Valkonen 1996a; Martikainen and Valkonen 1996b; Mellstrom et al. 1982; Parkes et al. 1969; Schaefer et al. 1995; Young et al. 1963).

A novel finding of our study showed a larger increase with approaching widowhood before spousal death for women whose spouses died of dementia than for women whose spouses died of other causes. The prevalence of antidepressant use was elevated during 27 to 3 months before widowhood among dementia widows, relative to other widows. The excess prevalence disappeared after a husband with dementia had died, mainly because antidepressant use for other widows increased markedly following widowhood. The results for male widowers were relatively similar, despite small numbers and a lack of statistical significance.

There are many complementary explanations for the differences in antidepressant trajectories among widows whose spouses die of dementia compared with those whose spouses die of other causes. First, Alzheimer's disease and other types of dementia are characterized by gradual decline in cognitive function, eventually impairing independence in daily activities and increasing care needs (van der Linde et al. 2016). Decline in cognitive function among dementia patients is associated with behavioral and psychological symptoms, which can be particularly burdensome for the spouse before widowhood. The surviving spouse may experience an emotional loss of a partner to dementia before physical death occurs because a partner's reasoning and behavior may have profoundly changed (Blandin and Pepin 2015). This emotional loss may cause severe depressive symptoms already before a spouse's death. Second, unexpected behavior of a partner with dementia may also lead to an increasing need for surveillance and intensive care. Previous studies have shown that the need for care intensifies as dementia progresses (van der Linde et al. 2016), placing physical demands on a caregiver.

Third, alongside with caregiving burden and emotional distance, also physical distance between spouses may increase with the progression of the disease and lead to increases

in depressive symptoms among the surviving spouse already before widowhood. It has been shown that older persons with dementia are more likely to move to care institutions than those with other chronic diseases (Nihtilä et al. 2008), and the likelihood of institutionalization is particularly high during the last year preceding a dementia-related death (Korhonen et al. 2018). Further research is therefore needed to assess whether changes in depressive symptoms among widowing individuals depend on a spouse's care arrangements.

The main strengths of the current study are credible records of a spouse's date and cause of death, a large population-based sample, and the continuous time scale for purchases of antidepressants. Information on antidepressants were derived from the prescription register, which cover the population resident in Finland, independent of their age and income (National Agency for Medicines and Social Insurance Institution 2016). The study has certain limitations, however. One limitation is that not all individuals with depression use antidepressants and some individuals may use antidepressants for non-psychiatric purposes. For example, it has been shown that only around a half of antidepressant users meet the criteria for major depressive disorder (Gardarsdottir et al. 2007; Sihvo et al. 2008), and in Finland a quarter of antidepressant users have no psychiatric diagnosis (Sihvo et al. 2008). Furthermore, in a study of Finnish general population, it was shown that approximately a third of depressed individuals received any treatment (Hamalainen et al. 2004), and the use of antidepressants was even lower (Hamalainen et al. 2009; Laukkala et al. 2001; Sihvo et al. 2010). The situation is similar to other European countries (Andrews et al. 2001; Kessler et al. 2005; Martin et al. 2006). However, increasing severity of symptoms still predicts a higher probability to seek treatment (Hamalainen et al. 2004).

Conclusions

In a register-based study of 41,855 widowed individuals, it was shown that the use of antidepressants increases at the time of widowhood, and this increase takes place already before widowhood for those whose spouse dies of dementia. The findings suggest that losing a spouse to dementia-related death is an experience different from that of losing a spouse to other causes of death. This is because Alzheimer's disease and other types of dementia are likely to cause profound changes in the relationship between the spouses long before the final loss.

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TABLES AND FIGURES

Table 1. Sample characteristics of widows by sex and spouse's cause of death in 1998-2007, Finland

	Spouse died of dementia	Spouse died of other causes	Widowed (total)
Widowed women (N)	2,579	27,189	29,768
Age at spouse's death, mean (SD)	76.7 (6.9)	69.5 (10.0)	70.2 (10.0)
Year at spouse's death, mean (SD)	2002.7 (2.8)	2002.1 (2.9)	2002.1 (2.9)
Education level, %			
Tertiary	8.2	10.7	10.5
Intermediate	15.3	20.1	19.7
Basic or less	76.5	69.2	69.8
Widowed men (N)	1,233	10,854	12,087
Age at spouse's death, mean (SD)	79.8 (6.5)	71.7 (10.7)	72.5 (10.6)
Year at spouse's death, mean (SD)	2002.2 (2.8)	2002.2 (2.9)	2002.2 (2.9)
Education level, %			
Tertiary	13.8	16.6	16.3
Intermediate	12.2	17.7	17.2
Basic or less	74.1	65.7	66.5
Abbreviations: SD, standard deviation			

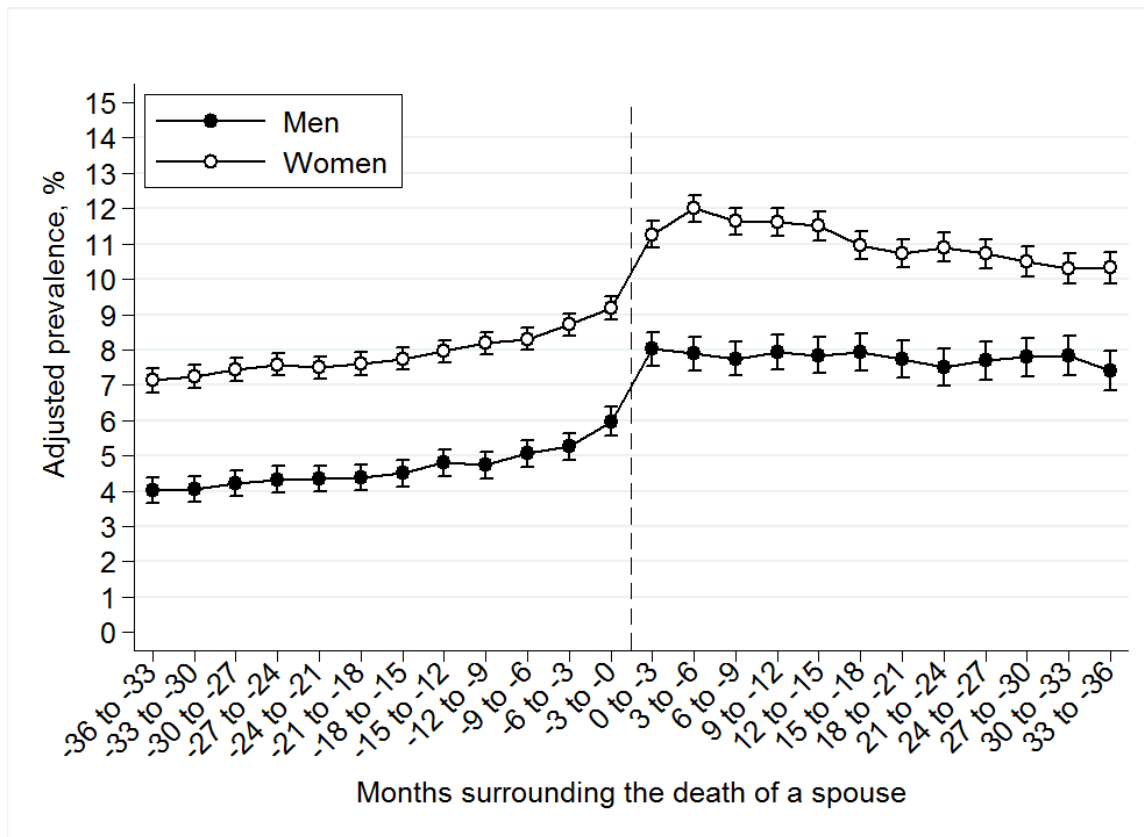


Figure 1. The use of antidepressants (3-month adjusted prevalence) surrounding the death of a spouse by sex, persons aged 40 and over at baseline, Finland, 1995-2007

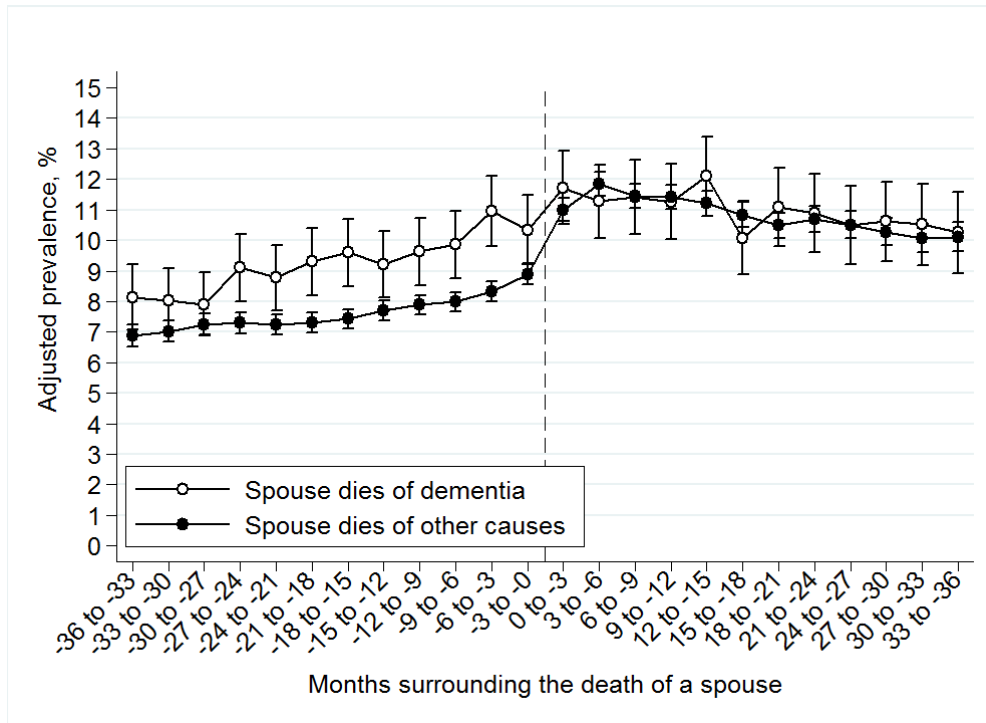


Figure 2. The use of antidepressants (3-month adjusted prevalence) surrounding widowhood by the cause of death of a husband, women aged 40 and over at baseline, Finland, 1995-2007

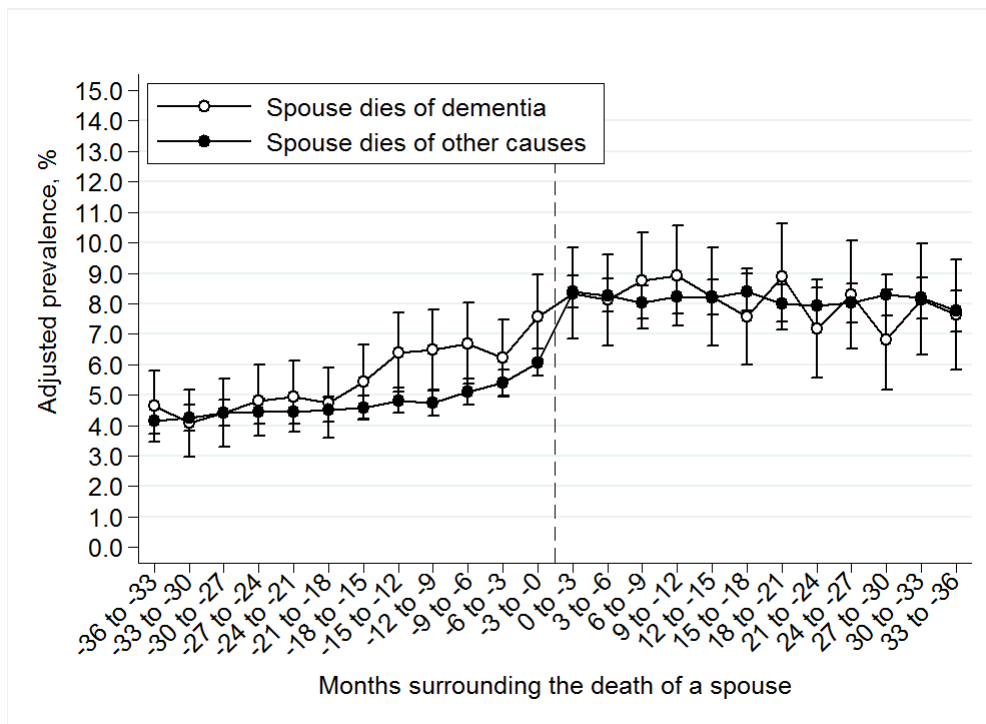


Figure 3. The use of antidepressants (3-month adjusted prevalence) surrounding widowhood by the cause of death of a wife, men aged 40 and over at baseline, Finland, 1995-2007