Risk factors for mortality after bereavement: a logistic regression analysis

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SUMMARY. A national sample of elderly widowed people was followed up for six years. Excess mortality was found for men aged 75 years and over in the first six months of bereavement compared with men of the same age in the general population. Logistic regression analysis, controlling for age and sex together, demonstrated that the best independent predictors of mortality among the elderly widowed were: interviewer assessment of low happiness level; interviewer assessed and self-reported problems with nerves and depression; and lack of telephone contacts. The general practitioner is well placed to assess levels of depression and unhappiness among the widowed and to check that they have adequate social support.

Introduction

IN modern society bereavement is most often an experience of the elderly and in particular, married women can generally expect widowhood as a normal part of old age. The death of a spouse not only means adjustment to a new, and often less well defined role, but also having to cope with a painful emotional state. Although Parkes has suggested that the elderly adjust better to bereavement than younger people, because it is less unexpected, the problems for the elderly bereaved should not be underestimated.[1]

There is an increase in morbidity and in consultation rates with general practitioners following bereavement.[1,2] The bereaved have higher rates of diagnosed psychiatric illness and psychiatric hospital admission rates than the non-bereaved.[1,2] There is also evidence of excess mortality among the widowed[3] but little is known about the causes of this. Several possible explanations have been put forward: the stress of the bereavement; lack of social support; and problems with role change following bereavement.[4]

In terms of depression, it has been found that men take longer to recover from the loss of a spouse than women. Also, although widows have been shown to have higher depression scores than widowers one year after bereavement, at two to four years widows were no more depressed than married women controls. Widowers, on the other hand, remained significantly more depressed than married men.[5]

Accumulating research indicates that a stressful life event may precipitate the onset of a physical or mental disorder.[6,7] There is evidence that bereavement can be stressful and affect morale and health in a negative way for up to 10 years.[8,9] Therefore, the hypothesis that the stress of bereavement may account for the increase in morbidity and mortality rates appears reasonable.

Studies also show an association between the existence of supportive relationships and mental and physical well being.[6-12] Given that men tend to have smaller circles of friends than women, this may partly explain why men are more vulnerable after bereavement — they are more likely to have lost their only or major supporter.[13]

Various demographic trends have intensified the problems of the elderly widowed. The proportion of elderly people living alone is increasing; greater geographical mobility combined with decreasing family size means that elderly people have fewer children and that those they do have live further away. Also, with increasing employment of women, daughters, the traditional carers, are less available to care for their elderly parents.

Role change may be necessary when the death of a spouse leaves the surviving partner with loss of practical support. The survivor has to take over household tasks previously performed by the spouse. It has been found that widowed men aged 75 years or over are the group most likely to have to start preparing meals and undertaking domestic chores for the first time after their bereavement. However, they are more likely than widows to have help with these tasks.[2]

There has been little research into mortality after bereavement, mainly because representative samples of widowed people are difficult to obtain. One exception is the recent study based on a national sample of widowed people, interviewed initially in 1979.[2] This survey provided the sampling frame for a subsequent study of mortality rates after bereavement. This paper examines associations between the mortality rates of this sample of widowed people and their social and psychological characteristics as determined in 1979.

Method

Study sample

In 1979 the Institute for Social Studies in Medical Care randomly selected eight areas in England (registration districts or their combinations), chosen with probability proportional to the number of deaths. In each area, the Office of Population Censuses and Surveys randomly selected 200 deaths from all age groups, mostly registered in January 1979. The aim was to interview the widows of men aged 65 years or more and the widowers of women aged 60 years or more for a descriptive study of the problems of the elderly widowed. The sample of 1600 deaths was found to include 160 married women and 343 married men in the required age groups, a total of 503. This is close to the numbers expected from national statistics.

Interviews with respondents were carried out on average 5.4 months after the spouse's death. Fifteen of the widowed had died in the intervening period and of the remaining 488 people, 361 (74%) were successfully interviewed, proxy interviews with the carers of frail widowed people were completed for a further 19 (4%), 10 (2%) had moved and 98 (20%) were unwilling to be interviewed.

Measurements used

The measures which were used in the interview survey, and which were analysed in relation to mortality for the follow up study, are shown in Table 1. These included measures of health status, social support and involvement, emotional adjustment and well being.[14] Interviewers were also asked to assess the emotional status of the widowed.

Table 1. Measures of health status, adjustment to bereavement and social support and involvement used in the interview survey.

Health status	Emotional state/ adjustment to bereavement	Social support and involvement
Self assessed	*Self assessed*	*Self reported*
Symptoms (from checklist and open ended questions) Difficulties in daily living Amount/type of medication taken since bereavement and in last two weeks	Irritability Nerves/depression Not coming to terms with bereavement Feeling remote even among friends Wish to change life Things not going well Loneliness	Household composition Feelings about living alone Existence of contact with: children, siblings, other relatives, friends, neighbours, professional key people
	Interviewer assessed	Person seen most
	Depression Element of relief at death Living in past Happiness state Still grieving	Person who is most help Person who is most comfort Hobbies Clubs Activities Work Religious involvement

Follow up study of mortality rates

The initial random sample of 503 elderly widowed people was entered into a prospective flagging operation by the Office of Population Censuses and Surveys. They have now been flagged for over six years. The aims of the scheme were: (1) to document the mortality rates of the sample, and to compare them with the total population using the Registrar General's English life tables;[15] (2) to analyse the mortality rates of responders in relation to their social, psychological, economic and physical characteristics.

It could be argued that there is no way of separating out the factors specifically associated with the effect of bereavement on mortality without using a control group. However, comparisons between the widowed who died and those who survived give useful indications of the factors related to mortality after widowhood and generally.

Results

Mortality rates: sex, age and social class

Between January 1979 and January 1985, 84 of the 343 widows (24%) and 62 of the 160 widowers (39%) died — over a quarter (29%) of the initial sample. Death rates were lower among the 361 responders (24%) than among the 123 non-responders (38%) and 19 frail widowed (58%) whose carers gave proxy interviews (chi-square = 16.5, $P < 0.001$).

For widowed men aged under 75 years, mortality rates were no different from those of the total population of men of this age. However, for widowed men aged 75 years or more there were twice as many deaths as would be expected in the first six months of bereavement ($P < 0.05$, t-test). The mortality rates for women were generally lower than expected. These findings have been reported in more detail elsewhere.[3]

A difference in mortality with social class was also found: for the widowed in social classes 1 and 2 the mortality rate was 39%, in classes 3M and 3N 15%, and in classes 4 and 5 20% (chi square = 8.9, $P < 0.02$).

Other factors associated with mortality: bivariate analyses

The relationship between mortality over the period January 1979 to January 1985 and age, sex and social class were similar for responders and non-responders in the interview survey. There was no significant association between the mortality rates of the widowed and the events surrounding the illnesses or deaths of their spouses, for example length and type of illness; place and cause of death; help needed and given; information wanted and received about the prognosis.

Measures indicating a low level of social support and of emotional well being were associated with the mortality rates of the widowed; these results have been reported in more detail elsewhere.[16] There was a significant relationship between mortality six years after bereavement and self-reported depression for the widowed men (chi-square test, $P < 0.001$). There were also significant relationships between mortality and interviewers' assessment of depression for the widowed aged 75 years and over ($P < 0.01$), for widowed men ($P < 0.01$) and for the widowed in social classes 1 and 2 ($P < 0.01$). Mortality was also significantly higher for widowed men ($P < 0.05$) and the widowed in social classes 1 and 2 ($P < 0.05$) when interviewers reported low happiness levels. Those assessed by the interviewers as needing help, usually for social reasons, had higher mortality rates up to five years after bereavement, but the difference was no longer significant after six years. Significant relationships with mortality were also found for taking non-psychotropic medication ($P < 0.001$) and contact with district nurses ($P < 0.05$) and home helps ($P < 0.05$).

The social support measures which were significantly related to mortality included contact with grandchildren ($P < 0.01$) and telephone contact with relatives, friends or neighbours ($P < 0.01$). Mortality was also related to daily contact with children five years after bereavement, but this was no longer significant at six years.

Logistic regression analysis

The variables included in the logistic regression analysis were those in which the univariate analyses had previously been found to be associated with raised mortality five years after bereavement.[16] As age and sex were highly significant, and since some factors may not be independent of age and sex, they were included in all models. Thus, in the logistic regression analysis all two-way interactions involving age and sex were tested. Since none of these were found to be statistically significant, models with main effects only were fitted.

Table 2 shows the results for the model controlling for age and sex together as main effects. The variables were dichotomized and the risks expressed relative to the alternative. This demonstrates that the best predictors of mortality within six years of bereavement were: lack of telephone contacts, self-reported nerves or depression, interviewer assessment of depression and interviewer assessment of a low level of happiness.

Relative risk analysis

The use of logistic regression analysis enabled the relative risks of mortality to be estimated for the variables entered and Table 2 shows those which achieved statistical significance.

People with the highest relative risk of dying after widowhood, controlling for age and sex, were those whom interviewers rated as low on a happiness scale, those who assessed themselves as depressed, those whom interviewers assessed as depressed and those who lacked telephone contacts. Only these four variables reached statistical significance. Although those taking most medication and those who interviewers rated as being most in need of help were estimated to have more then twice the relative risk of dying, this difference did not reach statistical significance.

Table 2. Logistic regression analysis of factors associated with mortality six years after bereavement and estimated relative risks of mortality.

Variables associated with increased risk[a]	Relative risk	95% confidence limit
Taking 2–3 types of medication in 2 weeks before interview[b]	2.41	0.68–4.55
Taking more than 3 types of medication since bereavement	2.28	0.89–5.86
Interviewer assesses definite need for help	2.29	0.74–7.08
Interviewer assesses low happiness level[c]	3.41*	1.29–9.05
No telephone contacts	1.98*	1.12–3.50
Interviewer assesses depression	2.33**	1.34–4.13
Self-reported nerves or depression	1.86*	1.07–3.24
Not relieved at spouse's death following illness	1.74	0.91–3.35
Living in past	1.69	0.71–4.03
Less than weekly contact with children	1.60	0.07–3.66
No contact with church representative	1.57	0.91–2.70
Not finished grieving	1.43	0.76–2.67
Given up hobby/activity	1.08	0.56–2.11
Not seen all grandchildren since bereavement	1.02	0.56–1.87
Social classes 1 and 2	0.60	0.21–1.70

*$P<0.05$, **$P<0.01$, chi-square test.
[a]After adjustment for effects of age and sex by logistic regression. [b]Few respondents took more than three types of medication in these two weeks. [c]Low level of happiness was compared with intermediate and high levels together.

The variables which just missed statistical significance may also be risk factors for mortality and the findings should be interpreted with some caution, given the wide confidence intervals and small sample size. Even when results were insignificant the trends were in the expected direction.

Discussion

This follow-up study of a national sample of elderly widowed people found excess mortality for men aged 75 years and over in comparison with men of the same age in the general population. This increased risk for widowers in the first six months of bereavement supports the results of other studies.[17,18] Large scale studies of the widowed also confirm the reduced immediate and long-term risk for widows, although they are not consistent in the extent of the reduction.[18,19] The higher mortality rate among the non-responders in the interview survey may be because they were frailer than the responders, hence their refusal to be interviewed. On the other hand, men were slightly over-represented among responders and, given their excess mortality rates, this should have increased mortality rates among responders, rather than non-responders. The higher rates of mortality for higher social class found here is consistent with previous work on the nature of marital relationships within the social classes.[10,20,21]

Univariate analyses reported elsewhere[16] showed a number of social and psychological measures were significantly associated with mortality among the widowed, often for men and for those aged 75 years and over. Logistic regression analysis was used to explore any inter-relationships between variables. Models controlling for age and sex together as main effects demonstrated that the best independent predictors of mortality were: inter-

viewer assessment of low happiness level; interviewer assessed and self-reported problems with nerves and depression; and lack of telephone contacts, the latter probably reflecting the quality of social support. Relative risk analysis confirmed the significance of these variables.

This was an exploratory analysis and should not be regarded as a predictive test. However, it appears that a major predictor of mortality after bereavement is psychological adjustment. This is consistent with evidence from larger studies of the causes of death among the recently widowed — diseases of the heart, and deaths from accidents, poisonings and violence are excessive among the widowed in comparison with the non-widowed of the same ages.[22] The findings presented here lend support to the theory that a stressful life event may precipitate the onset of morbidity and consequent mortality. As Parkes found that men take longer than women to recover from depression after widowhood, it appears that there is some psychological basis for the excess risk of mortality among widowers.[5]

According to the 1983 general household survey people aged 65 years and over have an average of six consultations per year with their doctors.[23] The general practitioner is therefore in a good position to assess risk factors for mortality after bereavement. The findings presented here suggest that the widowed should be assessed for levels of depression and unhappiness, and for social support.

Cartwright has commented on the decline in home visiting by general practitioners,[24] who are thus increasingly unlikely to be aware of the home circumstances of their elderly widowed patients:

'I suggest that at the time when the elderly widowed are having to cope with living alone, with making decisions that were formerly shared or taken by the spouse who has died, and with dealing with additional and unfamiliar household tasks, a visit to the home is likely to be particularly revealing. It may also be especially rewarding. As Dr D.J. Pereira Gray ... has said: "A cup of tea given to the doctor at home by a widow who wants to talk about her dead husband may be worth several counselling sessions".'[24]

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