The repeated use of the 15-item Geriatric Depression Scale

Abstract

**Background** The 15-item Geriatric Depression Scale (GDS-15) is a widely used screening instrument for depressive symptoms in the elderly, but its ability to detect alterations in depressive symptoms over time has not been established.

**Objective** To assess the change of the GDS-15 score after a major negative life event.

**Methods** Within the Leiden 85-plus Study, we prospectively followed a population-based cohort of 599 subjects from 85 years onwards. The GDS-15 was applied annually to participants with a Mini-Mental State Examination (MMSE) score above 18 points. The change in GDS-15 score of 32 subjects who had lost their partner during follow-up was compared with a control group of 32 subjects who had not lost their partner, matched for age, sex, and initial GDS-15 score.

**Results** At baseline, 241 subjects lived together with a partner. During a mean follow-up of 3.2 years, 55 participants (23%) lost their partner. Of those, 32 subjects completed the GDS-15 before and after the loss of their partner. All subjects reported the bereavement to be a major negative life event. The mean increase of the GDS-15 score after the death of a partner was 1.2 points (paired t-test, p = 0.013). This was significantly higher than the mean change of - 0.06 points in the matched control group (independent t-test, p = 0.032), and independent of sex, level of education, pre-bereavement GDS-15 score, and time period since the loss of a partner.

**Conclusion** This study shows that the GDS-15 detects change in depressive symptoms after loss of a partner, a negative life event that is the most important risk factor for depression in the elderly. Therefore, it may be concluded that the GDS-15 has the ability to measure longitudinal alterations in depressive symptomatology.
Introduction

Depression, in particular minor depression, is common among community-dwelling elderly. Recognition of depression in old age is difficult because of somatic co-morbidities and because depressive symptoms may be dismissed as natural consequences of frequently occurring negative life events and illnesses. The 15-item Geriatric Depression Scale (GDS-15) is the shortened, less time consuming version of the 30-item GDS which has been especially designed to screen for depression in the elderly. Both the long and the short form of the GDS focus on functional and mood symptoms of depression rather than on potentially misleading somatic features. Several studies have validated the use of the GDS-15 for screening of depressive disorder at old age in geriatric inpatients, outpatients, and in primary care. Recently, we have shown that the GDS-15 has good properties in screening for depression in the community-living oldest old.

For clinical as well as scientific use it is also important to study the characteristics of the GDS-15 when it is repeatedly assessed. When a symptom scale as the GDS-15 is assessed longitudinally, it is important to demonstrate its ability to measure alterations in depressive symptomatology, for example in response to a well-defined negative life event. Although both the GDS long form and short form have been applied as repeated measurements in some studies, the ability of the GDS-15 to detect change in depressive symptoms over time has not yet been established.

In the elderly, negative life events are known to increase the risk of depression. The more severe the experienced negative life event is, the more serious depressive symptomatology will be, and the higher depressive symptom scores are. In old age, the loss of a partner is a well-established major negative life event leading to an increase of depressive symptoms.

The aim of this study was to determine the ability of the GDS-15 to detect alterations in depressive symptomatology in the elderly after a major negative life event. Therefore, we examined changes in GDS-15 scores over time for elderly who had lost their partner compared to those who had not lost their partner, in the Leiden 85-plus Study, a population-based prospective study of the oldest old.

Methods

The Leiden 85-plus Study is a prospective population based study of all 85-year old inhabitants of Leiden, The Netherlands. The study and characteristics of the cohort were described in detail previously. In short, between September 1997 and September 1999 all 705 members of the 1912 to 1914-birth cohort were asked to participate in the month after their 85th birthday. There were no selection criteria for health or demographic characteristics. Of the 705 eligible subjects, 14 died before they could be enrolled and 92 refused to participate resulting in a cohort of 599 subjects (response rate 87 %) who were enrolled. All subjects gave informed consent. For cognitively impaired subjects informed consent was obtained from a guardian. The Medical Ethical Committee of the Leiden University Medical Center approved the study.
Each year, subjects were visited at home for face-to-face interviews to collect extensive data on sociodemographic characteristics, functioning and well-being. The Mini-Mental State Examination (MMSE) was used to screen for cognitive impairment. The GDS-15 was administered in subjects with an MMSE-score above 18 points only, in order to assess depressive symptoms reliably. The score range of the GDS-15 is 0 to 15 points, with higher scores indicating more depressive symptomatology. Furthermore, participants were asked to report major negative life events annually.

For this study, all subjects who were living with a partner were followed up until September 1st 2002 (censoring date) or the day of death of a partner as obtained from the civic registry. A partner was defined as the person with whom a participant shared a household. In order to be able to measure changes in symptom scores, only subjects who completed the GDS-15 before and after the death of a partner were included. A control group was formed by matching all subjects who had lost their partner with subjects who had not lost their partner, for age, sex, and initial GDS-15 score.

Paired t-tests were applied when assessing the change of GDS-15 scores within a group, and independent t-tests when comparing the change of GDS-15 score between groups. The change in separate GDS-15 items were compared with chi-square tests. To examine the effect of sex and level of education on the change of the GDS-15 score after the loss of partner, independent t-tests were applied. The association between the time period since the loss of a partner and the pre-bereavement GDS-15 score on the change of GDS-15 score (dependent) were assessed with linear regression tests.

Results

At baseline, 241 subjects aged 85 years lived together with a partner. Hundred seventy-eight subjects (74 %) lived together with their spouse, 34 subjects (14 %) lived together with a relative, and 29 subjects (12 %) with a friend. In total, 55 subjects (23 %) had lost their partner during the mean follow-up period of 3.2 years. Of those, 32 participants completed the GDS-15 before and after the death of their partner. All these subjects reported the loss of their partner as a major negative life event. The control group consisted of 32 matched subjects who did not loose their partner (Table 3.1).

<table>
<thead>
<tr>
<th>Loss of partner</th>
<th>Yes (n = 32)</th>
<th>No (n = 32)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex (%)</td>
<td>15 (47 %)</td>
<td>15 (47 %)</td>
</tr>
<tr>
<td>High level of education (%)</td>
<td>18 (56 %)</td>
<td>14 (44 %)</td>
</tr>
<tr>
<td>Married (%)</td>
<td>29 (91 %)</td>
<td>24 (75 %)</td>
</tr>
<tr>
<td>MMSE score (median, interquartile range)</td>
<td>27 (24 - 28)</td>
<td>27 (25 - 28)</td>
</tr>
<tr>
<td>GDS-15 score (median, interquartile range)</td>
<td>2 (1 - 4)</td>
<td>2 (1 - 4)</td>
</tr>
</tbody>
</table>

Subjects who had lost their partner were matched by age, sex, and initial GDS-15 score with subjects who had not lost their partner.

More than 6 years of schooling.
Figure 3.1 shows the distribution of the individual changes of GDS-15 scores in a one-year period depending on the loss of a partner. The mean increase of GDS-15 scores in subjects who had lost their partner was 1.2 points (paired t-test, p = 0.013). In the control group the mean score of GDS-15 remained unaltered (mean change - 0.06 points, paired t-test, p = 0.86). The mean change in GDS-15 scores was significantly higher in subjects who had lost their partner compared to the mean GDS change in the control group (independent t-test, p = 0.032).

Figure 3.1 The individual changes of 15-item Geriatric Depression Scale (GDS-15) scores in a one-year period depending on the loss of a partner. The black line indicates the mean change of GDS-15 score in both groups.
Of the 32 participants who lost their partner, 17 subjects (53%) had an increase of two points or more on the GDS-15 compared to only 5 subjects (16%) in the control group (chi-square, \(p = 0.003\)). The GDS-15 items which were significantly more often reported after the loss of a partner were "Do you think that your life is empty?" (28% versus 6%, chi-square, \(p < 0.05\)), "Do you prefer to stay at home, rather than going out and doing things?" (41% versus 16%, chi-square, \(p < 0.05\)), and "Not feeling full of energy" (19% versus 3%, chi-square, \(p < 0.05\)). The change of GDS-15 score after the loss of partner was independent of sex (independent t-test, \(p = 0.38\)), level of education (independent t-test, \(p = 0.11\)), pre-bereavement GDS-15 score (linear regression, \(\beta \ [95\%\ CI], -0.06\ [-0.33\ to\ 0.25]\)), and the time period between the loss of a partner and the follow-up assessment of the GDS-15 (linear regression, \(\beta \ [95\%\ CI], -0.06\ [-0.68\ to\ 0.13]\)).

The participant with the highest increase of the GDS-15 score (plus nine points) was a man. The relationship with his spouse had been very good and her sudden death came unexpectedly. The participant with the highest decrease of the GDS-15 score (minus four points) was a highly educated woman. The relationship with her chronic diseased spouse had worsened over the last year before his, not unexpected, death. Nevertheless, she reported the loss of her partner as a major negative life event.

To differentiate acute bereavement reaction from post-bereavement depression, we restricted the analyses to the 28 subjects who lost their partner more than two months before assessment. The mean increase of the GDS-15 score in these subjects remained similar (+1.1 points, paired t-test, \(p = 0.04\)).

**Discussion**

The aim of the present study was to assess the ability of the GDS-15 to detect longitudinal alterations in depressive symptomatology in community-dwelling elderly. The loss of a partner is a well defined negative life event and the most important risk factor for depression in the elderly. Our study shows that the GDS-15 scores after the loss of a partner increased, while the GDS-15 scores in the control group remained unaltered.

Recently, we have shown that the GDS-15 has good properties in screening and diagnosing depression in the general population of the oldest old. These new findings demonstrate that, in a similar population, the GDS-15 also accurately detects the occurrence of depressive symptoms after loss of a partner. We found a significant mean increase of 1.2 points on the GDS-15, indicating that in longitudinal studies a rather small change in GDS-15 scores is of importance. In our opinion, one may conclude that an increase of two points or more of the GDS-15 score is clinically relevant.

Within the Leiden 85-plus Study, we annually assessed the GDS-15 in a representative sample of elderly subjects from the general population. Information on the loss of a partner could reliably be obtained from the civic registry. From the Leiden 85-plus Study, a carefully matched control group was available for comparison with the group who had lost their partner. Since only subjects with a MMSE score above 18 points were involved, a relatively small number of subjects was included in our study. However, this sample did not prevent us from showing a significant change in GDS-15 score.
The loss of a partner is usually accompanied by a process of mourning and grief. Depressive symptoms such as feelings of sadness, insomnia, poor appetite, and weight loss occurring shortly after the loss of a loved one is referred to as bereavement\(^{24}\). Only if depressive symptoms persist beyond two months after the loss of a loved one, a diagnosis of depression may be given. However, our results did not change when we excluded subjects who lost their partner within two months of the follow-up assessment, indicating that the increase of the GDS-15 score was not dependent of acute bereavement alone.

In conclusion, in this prospective population-based study of 85-year old subjects, we found a significant increase of the scores on the GDS-15 after loss of a partner, a major negative life event. Although we did not formally evaluate all aspects of responsiveness\(^{25}\), our findings support the use of the GDS-15 as a depression rating scale for repeated measurements in longitudinal studies among the elderly. Moreover, the repeated use of the GDS-15 for the purpose of evaluating clinical outcome seems justified.

References

The repeated use of the 15-item Geriatric Depression Scale
