Screening for depression among acutely ill geriatric inpatients with a short geriatric depression scale

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Abstract

Background: depression is not uncommon among acutely ill geriatric inpatients.
Method: the performances of shorter versions of the Geriatric Depression Scale (GDS) in screening for depression among acutely ill geriatric inpatients were examined.
Results: a cut-off of 2/3 gives the best sensitivity (88%) and specificity (75%) for the 10-item version (GDS10). A cut-off of 0/1 gives the best sensitivity (72%) and specificity (90%) for the 4-item version (GDS4). A positive response to item 6 ("Do you often feel helpless?") on the GDS10 gave a sensitivity of 76% and specificity of 75%. Patients found the GDS10 tolerable and acceptable.
Conclusion: both shorter versions of the GDS may be utilized in screening for depression among acutely ill geriatric inpatients.

Keywords: depression, old age, rating, screening

Introduction

Up to 46% of acutely medically ill geriatric inpatients have depression [1-9]. Depressed medically ill elderly inpatients are poorly compliant with treatment [2, 3, 10] and have longer hospital admissions [11]. Their physical illnesses may be difficult to treat [12-14] and mortality is increased [15-18].

Despite this poor outcome and a high prevalence, depression is poorly recognized and treated in elderly patients in hospital [1, 4, 7, 9, 10, 19]. House staff miss up to 90% of cases of depression among geriatric inpatients [1, 10, 19]. Even when the house staff were informed of major depression, less than one-third of patients received psychiatric assessments [10]. Furthermore, antidepressants are used infrequently and inadequately [4, 10, 19].

Improvement in the recognition of depression in older inpatients should be an important priority because strategies for improving treatment can only be implemented after recognition of the depression. The original 30-item Geriatric Depression Scale (GDS30) [20] has been widely used in screening for depression in elderly inpatients [4, 5, 21]. Recent studies in primary care [22] and continuing care geriatric wards [23] have validated shorter forms of the original scale, including 15-item (GDS15) [24], 10-item (GDS10) [22] and 4-item (GDS4) versions [22]. The primary care study also demonstrated their acceptability to patients and general practitioners [22]. As shorter versions are comparatively quicker, easier to administer and more acceptable they may be utilized more readily for screening. We report a study evaluating GDS10 [22] in detecting depression in acutely ill elderly inpatients.

Methods

Location and sample

All patients admitted to the four acute geriatric medicine wards at West Middlesex University Hospital during the 2 month period 6 December 1995-6 February 1996 were considered for study. Only patients over the age of 80 are admitted to this unit; 'younger' elderly patients are treated elsewhere in the hospital.
Table 1. Performances of 10- and 4-item Geriatric Depression Scales (GDS10 and GDS4) against the Brief Assessment Schedule depression scale \((n = 53)\)

<table>
<thead>
<tr>
<th>Instrument/cut-off score</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>Predictive value (%)</th>
<th>Agreement (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDS10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>100</td>
<td>54</td>
<td>66</td>
<td>75</td>
</tr>
<tr>
<td>2/3</td>
<td>88</td>
<td>75</td>
<td>76</td>
<td>81</td>
</tr>
<tr>
<td>3/4</td>
<td>56</td>
<td>82</td>
<td>73</td>
<td>61</td>
</tr>
<tr>
<td>GDS4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0/1</td>
<td>72</td>
<td>90</td>
<td>86</td>
<td>81</td>
</tr>
<tr>
<td>1/2</td>
<td>48</td>
<td>93</td>
<td>86</td>
<td>72</td>
</tr>
</tbody>
</table>

Patients were interviewed when the clinical team felt they were medically well enough. If the clinical team considered that a patient would be unable to complete the semi-structured interview and the screening questionnaire because of severe cognitive impairment, that patient was excluded.

**Assessments**

The main assessment instrument was the Brief Assessment Schedule (BAS), derived from the Comprehensive Assessment and Referral Evaluation (CARE) [25]. The BAS was chosen as the 'gold standard' because it is a semi-structured interview and was conducted by an appropriately trained psychiatrist (A.S.). It consists of an organic brain syndrome scale (BAS-OBS) with a scoring range of 0–8 and a depression scale (BAS-DEP) with a scoring range of 0–24. According to their scores on the BAS-OBS scale, respondents can be classified as 'probably severely demented' (8), 'probably mildly–moderately demented' (3–7) or 'probably not demented' (0–2). A score of 7/24 or greater on the BAS-DEP scale has been shown to be predictive of the presence of a significantly depressed state [26, 27] with good reliability [28]. Moreover, the BAS has been successfully utilized in identifying depression in acutely ill [5] and continuing care [21] geriatric inpatients, elderly patients attending a casualty department [29] and elderly patients with hip fractures [30].

Within 1 week of the BAS interview the GDS10 [22] was administered by one of the three junior doctors (R.H., S.L., R.M.) in geriatric medicine; they were blind to the BAS assessment. The GDS10 (Appendix) is a short self-rating screening questionnaire for depression in elderly subjects and does not require staff training. At the same time, patients were asked to answer two questions (“Did you find the questionnaire difficult?” and “Did you find the questionnaire acceptable?”) measuring the tolerability and acceptability of the GDS10 on a three-point scale ('not at all', 'quite' and 'very') [22]. The GDS4 (Appendix) was derived from the GDS10.

Data on age, sex, physical drugs, psychotropic drugs, length of admission in hospital at the time of the assessments and the abbreviated mental test score [31] were recorded from the case notes.

**Data analysis**

The \(\chi^2\) test, Kendal's rank correlation test and Mann–Whitney \(U\) test were used for analysis. Receiver operating characteristics curves [32] were used to examine the sensitivity and specificity. Sensitivity, specificity, positive predictive and negative predictive values were calculated for each GDS cut-off score.

**Results**

**Sample**

Eighty patients were eligible for study. The BAS was completed in 63 patients and the GDS10 in 53 patients. Thus, data on both the BAS and the GDS10 were available for 53 patients. The BAS and the GDS10 was not completed in 17 patients because of refusal \((n=13)\) and discharge before assessment \((n=4)\). The BAS was completed without the GDS10 in 10 patients because of discharge before GDS10 completion \((n=8)\), withdrawal of consent \((n=1)\) and re-development of serious medical illness \((n=1)\). There were no differences between the study and the excluded group in terms of age, sex, medication and length of stay. There were 48 (60%) females and 32 (40%) males. The median age was 86 years (range 79–103). The median length of admission at the time of interview was 10 days (range 2–168).

**Prevalences of depression and dementia**

The prevalences of depression and dementia were 45% (28/63) and 21% (13/63; all mild/moderate) respectively. There was no association between the presence of depression and age, sex, physical medication, psychotropic medication (including antidepressants...
and benzodiazepines), BAS-OBS scores and caseness for dementia and the abbreviated mental test scores [31].

**Performances of GDS10, GDS4 and individual GDS10 questions**

The performances of the GDS10 and GDS4 against the BAS-DEP (including sensitivity, specificity, positive predictive and negative predictive values) for selected cut-off scores are shown in Table 1. The cut-off of 2/3 on the GDS10 gave optimum sensitivity (88%) and specificity (75%). The cut-off of 0/1 on the GDS4 gave optimum sensitivity (72%) and specificity (90%). A positive response to question 6 of the GDS10 ("Do you often feel helpless?") gave a sensitivity of 76% and specificity of 75% in detecting depression; all the other items, when considered individually, had less satisfactory sensitivity and specificity values.

**Acceptability of the GDS10**

The GDS10 questions were found 'not at all' and 'quite' difficult by 85% and 15% of the patients respectively. Ninety-three percent of the patients found the questions acceptable (53% quite acceptable and 38% very acceptable). There was a positive correlation between BAS-DEP scores and finding the GDS10 questionnaire difficult ($\tau = +0.12$, $P = 0.051$); also those in whom the BAS-DEP indicated depression found the questionnaire more difficult (Mann-Whitney $U$-test, $Z = -2.32$, $P = 0.01$). There was no relationship between BAS-DEP and the acceptability question and between the GDS10 and both the questions. There was no relationship between the BAS-OBS scores and these acceptability and difficulty questions.

**Discussion**

This study was designed to resemble normal clinical practice should screening be undertaken routinely. In everyday clinical practice, screening instruments are likely to be administered by junior doctors, patients are likely to be screened when their medical illness has improved and patients with severe cognitive impairment are unlikely to be screened for depression.

A cut-off score that maximizes sensitivity should be used for tests that screen for a disease with a high morbidity, have little risk associated with screening and are inexpensive. A cut-off score that maximizes specificity should be used where screening leads to significant side-effects, has serious consequences, is expensive and is used to detect a less serious disease. A cut-off score with high sensitivity is important because depression in geriatric inpatients is common and has poor outcome, and the GDS10 is free of side-effects and inexpensive. However, as the aim of the screening is to identify and treat depression, including a referral to psychogeriatric services, the cut-off score should also have satisfactory specificity [23]. This will help reduce inappropriate treatment and referrals to psychogeriatric services for the false positives.

Sensitivity and specificity values over 70% are reported to be satisfactory for screening [5, 21]. The sensitivities and specificities of the GDS10 and GDS4 in the current study compare favourably with this. Furthermore, these sensitivity and specificity values compare favourably with those reported in primary care [22] and in continuing-care geriatric inpatients [23]. However, optimum sensitivity and specificity for GDS10 were at a lower cut-off of 2/3, in contrast to a cut-off of 3/4 in long-stay geriatric inpatients [23] and primary care [22]. This is difficult to explain. However, the severity and acuteness of the medical illness may help reduce the cut-off threshold. The presence of dementia is unlikely to have influenced completion of the GDS10 because patients with severe cognitive impairment were excluded and the 13 patients with dementia had mild or moderate cognitive impairment; this also was our clinical impression.

Caution should be exercised in extrapolating these findings as they apply only to one acute geriatric unit and are based on comparatively small numbers. The strength of this study was that the screening process closely resembled normal clinical practice. Furthermore, the screening instrument GDS10 was found to be tolerable and acceptable to patients. As shorter versions are quicker and well tolerated by patients, busy junior doctors and nursing staff in geriatric units are likely to utilize them more frequently and effectively. However, the utility and clinical impact of such screening will require prospective evaluation.

**Acknowledgements**

Help from the patients and the nurses was greatly appreciated. Comments of the anonymous referees were also appreciated.

**Key points**

- Depression is common in elderly inpatients.
- Short geriatric depression scales are useful in screening for depression.
- Short geriatric depression scales are tolerated by patients.

**References**


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### Appendix. The 10- and 4-item Geriatric Depression Scales [22]

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are you basically satisfied with life?</td>
<td>Yes/no</td>
</tr>
<tr>
<td>Have you dropped many of your activities?</td>
<td>Yes/no</td>
</tr>
<tr>
<td>Do you feel that your life is empty?</td>
<td>Yes/no</td>
</tr>
<tr>
<td>Are you afraid that something bad is going to happen to you?</td>
<td>Yes/no</td>
</tr>
<tr>
<td>Do you feel happy most of the time?</td>
<td>Yes/no</td>
</tr>
<tr>
<td>Do you often feel helpless?</td>
<td>Yes/no</td>
</tr>
<tr>
<td>Do you feel you have more problems with memory than most?</td>
<td>Yes/no</td>
</tr>
<tr>
<td>Do you feel full of energy?</td>
<td>Yes/no</td>
</tr>
<tr>
<td>Do you feel that your situation is hopeless?</td>
<td>Yes/no</td>
</tr>
<tr>
<td>Do you think that most people are better off than you are?</td>
<td>Yes/no</td>
</tr>
</tbody>
</table>

*Items included in the 4-item scale.*
Photograph: Help the Aged.