

# SCREENING FOR DEPRESSION: CLINICAL VALIDATION OF GERIATRICIANS' DIAGNOSIS, THE BRIEF ASSESSMENT SCHEDULE DEPRESSION CARDS AND THE 5-ITEM VERSION OF THE SYMPTOM CHECK LIST AMONG NON-DEMENTED GERIATRIC INPATIENTS

BOON LOKE

*Consultant Psychiatrist, Osborne Lodge, Stirling, Western Australia*

FRANK NICKLASON

*Consultant Geriatrician, Royal Perth Hospital, Perth, Western Australia*

PETER BURVILL

*Professor, University Department of Psychiatry, Queen Elizabeth II Medical Centre, Nedlands, Western Australia*

## SUMMARY

In this study, two screening instruments for depression and geriatricians' diagnosis were compared against the Geriatric Mental State Schedule (GMS), a standardized semi-structured psychiatric interview. The Brief Assessment Schedule Depression Cards (BASDEC) achieved 91% sensitivity and 85% specificity using a cutoff score of 7. Its receiver operating characteristics (ROC) had an area under the curve (AUC) of 0.88, with 95% confidence intervals of 0.78 and 0.98. The 5-item version of the Symptom Check List (SCL-5) achieved 77% sensitivity and 74% specificity using a cutoff score of 10. Its AUC was 0.77, with 95% confidence intervals of 0.63 and 0.90. The *p*-value of the statistical difference between the two AUCs was 0.0554. The geriatricians' diagnosis had a kappa agreement coefficient of 0.39, sensitivity of 55% and specificity of 96%. They missed 45% of depressed patients. Routine screening with BASDEC would considerably improve the detection of depression. Even among those patients who did not appear depressed to the geriatricians, BASDEC would detect one case in every 10 patients.

**KEY WORDS**—depression; screening; geriatricians; BASDEC; SCL-5; GMS-AGECAT

Between 20% and 35% of elderly patients in acute care settings are clinically depressed (Goff and Jenike, 1986). However, most internists and medical residents surveyed in the United States felt deficient in their ability to diagnose and treat depression in the elderly (Gallahan *et al.*, 1992). In a recent Australian study, few general practitioners knew the diagnostic criteria for depression, and few referred depressed elderly patients to a specialist (Bowers *et al.*, 1992).

There are currently no biological markers to assist primary health workers in detecting depres-

sion. The NIH Consensus Development Panel on Depression in Late Life (1992) concluded that 'at the present time, an attentive and focused clinical interview remains the mainstay for the evaluation and diagnosis of depression'. Gask *et al.* (1987) showed that a short course of interview training could improve non-psychiatrist clinicians in the diagnosis of psychiatric disorders. However, psychiatric interview might be too time-consuming in routine screening. Jablensky (1987) advocated simple and cost-effective screening instruments.

A number of studies have been carried out to validate screening instruments for depression in elderly populations. Although sensitivity and specificity are the common statistics used, they can be misleading because they vary with the

---

Address for correspondence: Dr Boon Loke, Inner City Psychogeriatric Unit, Royal Perth Hospital, 6<sup>th</sup> Floor, Anslie House, Wellington Street, Perth, Western Australia 6000.

prevalence of depression in studied populations. Goldberg (1985) used positive predictive value (adjusted PPV) adjusted to a prevalence of 30% to compare performance of screening instruments across studies. The adjusted PPV is the percentage of depressed patients who would be detected as depressed by the screening instrument if prevalence of depression were 30%.

The Beck Depression Inventory (BDI) (Beck and Beck, 1972) has been developed for use in general adult populations. It has an emphasis on the cognitive symptoms of depression. It consists of 21 items, each with four statements describing a symptom from absent to the severe degree. When used in elderly populations, it has achieved adjusted PPVs ranging between 45% and 68% (Rapp *et al.*, 1988; Norris *et al.*, 1987; Hyer and Blount, 1984). In the study by Olin *et al.* (1992), BDI had an adjusted PPV of 91%. This study had a major methodological flaw. It compared a group of known depressed patients with control normals. Subjects with borderline depression were therefore not included in the sample. The result cannot be applied in screening a high-risk population. A short form of BDI (Beck *et al.*, 1974) has achieved adjusted PPV of 64% in one group of community residents (Stukenberg *et al.*, 1990).

The Geriatric Depression Scale (GDS) has been specifically designed for elderly populations (Yesavage *et al.*, 1983). It consists of 30 true-false questions. When used in the elderly, it has achieved adjusted PPVs ranging from 43% to 82% (Rapp *et al.*, 1988; Norris *et al.*, 1987; Hyer and Blount, 1984; Shah *et al.*, 1992; Lobo *et al.*, 1990; Adshead *et al.*, 1992; Burke *et al.*, 1992; Koenig *et al.*, 1992; Snowdon, 1990; Kafonek *et al.*, 1989). The performance of GDS has been inferior in demented populations. Burke *et al.* (1989) found that the area (AUC) under the receiver operating curve (ROC) of GDS in non-demented patients was 0.85, while that in demented patients was 0.66.

Only one study (Rapp *et al.*, 1988) measured the concurrent detection rate of non-psychiatrist clinicians. In that study, the resident medical officers detected only 8.7% of depressed patients. Pond *et al.* (1990) found poor agreement between general practitioners' diagnosis and GDS, but did not compare them against an established psychiatric diagnosis.

In view of frequent visual and hearing impairments of elderly patients in busy general hospital wards, Adshead *et al.* (1992) claimed that the Brief Assessment Schedule Depression Cards

(BASDEC) (Appendix 1) is more user-friendly than GDS. BASDEC consists of 19 cards, each with a statement of a symptom in big bold letters. In that study, BASDEC had a sensitivity of 71% and specificity of 88% among non-demented geriatric inpatients. The adjusted PPV was 72%. There has been no replication study to date. Tams and Moum (1993) recommended a five-item version of the Symptom Check List (SCL-5) (Appendix 2) to screen for global psychiatric morbidity, in particular anxiety and depression. Its brevity is attractive but its utility has not been evaluated among elderly patients.

The main objective of this study was to test the null hypothesis that geriatricians, BASDEC and SCL-5 were equally effective in detecting depression among non-demented geriatric inpatients. A secondary aim of the study was to determine if an effective screening instrument should be used on all geriatric inpatients or only on those who appeared depressed to the geriatricians.

## METHOD

The subjects were consecutive patients to the geriatric wards at Royal Perth Hospital (RPH) and Royal Perth Rehabilitation Hospital (RPRH), Western Australia. They spoke and read adequate English, and scored 24/30 or higher on Folstein's Mini Mental State Examination (MMSE) (Folstein *et al.*, 1975).

The research geriatrician or resident medical officers administered SCL-5 and BASDEC in random order at the same sitting to nullify the order effect (Lucas, 1992). The geriatricians decided if their patients were depressed while they were still blind to the results of the screening. The research psychiatrist carried out the GMS interview (Copeland *et al.*, 1986) within 1 week of screening and in the same half of the day. At the interview and scoring of the GMS, the research psychiatrist was blind to the results of screening and the geriatricians' diagnosis. The patients were considered clinically depressed if the GMS interview as analysed by AGE-CAT (Copeland *et al.*, 1988) achieved a confidence level of dn3 or dp3, or above.

Besides sensitivity, specificity and positive predictive value, receiver operating characteristics (ROC) statistics were also applied in this study. A ROC curve plots sensitivity against false positive rate (1-specificity). The area under the curve

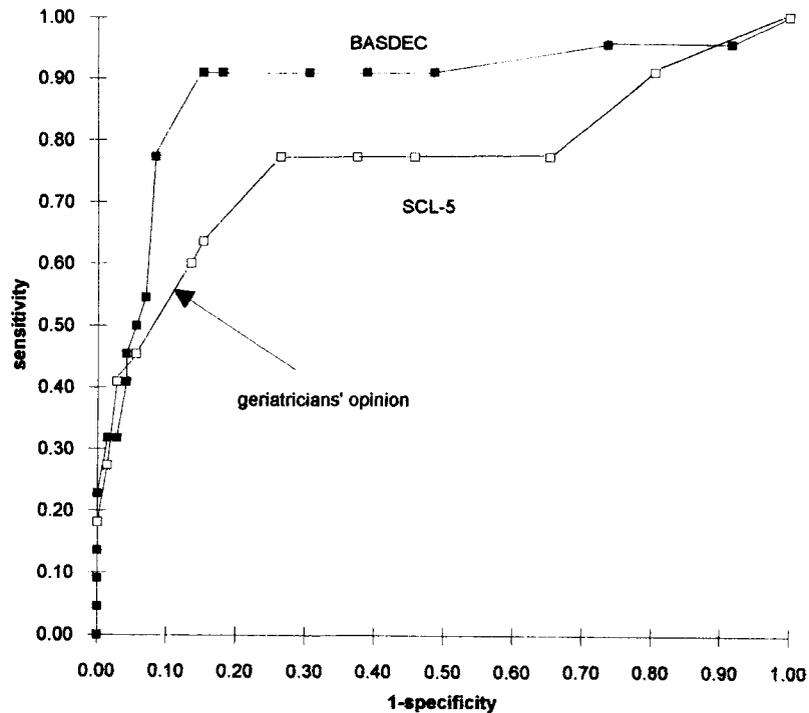


Fig. 1. Receiver operating characteristics curves

(AUC) provides a measure of the overall performance of a screening instrument using different cutoff points for different purposes (Hanley and McNeil, 1982). A perfect screening instrument has an AUC of 1.0, while that of a useless instrument approaches 0.5.

RESULTS

One hundred and two subjects were recruited in this study. All received the GMS interview. Ninety-four completed both screening questionnaires. The geriatricians provided their diagnosis on 98 subjects. Fifty-five medically ill patients were recruited from RPH. The other 47 from RPRH were undergoing rehabilitation following hip fractures. They were representative of the geriatricians' diverse caseload.

Twenty-two (22%) subjects were clinically depressed, 14 (26%) at RPH and eight (17%) at RPRH. Although the geriatricians correctly classified 77 of the 98 subjects (observed agreement rate of 79%), the kappa agreement coefficient was only 0.39. They missed 10 of the 22 depressed subjects (45%). They achieved a sensitivity of 55% and

specificity of 86%. Table 1 shows the geriatricians' diagnosis by GMS confidence levels.

At the recommended cutoff score of 7, BASDEC had a sensitivity of 91% and specificity of 85%. Its positive predictive value was 72% when adjusted to a prevalence of 30%. At a cutoff score of 10, SCL-5 achieved a sensitivity of 77% and specificity of 74%. The adjusted PPV was 56%. Fig. 1 and Table 2 show the ROC statistics of BASDEC and SCL-5.

Among the 71 patients who did not appear depressed to the geriatricians, BASDEC attained a positive predictive value of 80%, a negative predictive value of 97% and a misclassification rate of 6% if the cutoff score was raised to 8. In

Table 1. Geriatricians' diagnosis by GMS confidence levels

Geriatricians' diagnosis	GMS confidence levels for depression (dn and dp)				
	0	1	2	3	4
Not depressed	51	3	11	7	3
Depressed	9	0	2	5	7

Table 2. ROC statistics of BASDEC and SCL-5

	AUC	95% CL	Statistical significance
BASDEC	0.88	0.78-0.98	$p = 0.0554$
SCL-5	0.77	0.63-0.90	

other words, BASDEC detected eight out of 10 depressed patients that the geriatricians missed. It picked up about one case of depression in every 10 patients who did not appear depressed to the geriatricians.

### DISCUSSION

In this study, 22% of the subject patients were clinically depressed. The geriatricians missed 45% of the depressed patients. The geriatricians' diagnosis by GMS confidence levels (Table 1) suggests that the geriatricians were making random errors rather than having a high threshold in diagnosing depression. BASDEC, on the other hand, had 91% sensitivity and 85% specificity. By raising the cutoff score from 7 to 8, BASDEC achieved a misclassification rate of 6% and picked up one case of depression in 10 patients who did not appear depressed to the geriatricians. The performance of BASDEC is probably superior to that of SCL-5. Their respective AUCs were 0.88 and 0.77 and the  $p$ -value for the statistical difference between the two AUCs was 0.0554.

Although the statistics of BASDEC were impressive in this study, caution should be exercised when it is used in populations with a lower prevalence of depression, such as elderly people living in their own homes. The findings also cannot be readily generalized to patients with significant cognitive impairment. BASDEC was originally reported to take only 2-8 minutes to complete. The anecdotal experience during this study showed that patients with mild cognitive impairment or depression may take longer. Weighted questions in SCL-5, on the other hand, can be difficult for some elderly patients to comprehend.

This study is unique because the geriatricians' diagnosis was available to be compared with the screening instruments. The geriatricians achieved significantly better sensitivity (55% versus 8.7%) than that of resident medical officers in the study by Rapp *et al.* (1988). Nonetheless, their sensitivity of detecting depression can be further improved to

91% by routinely screening all non-demented inpatients with BASDEC.

The results have replicated the findings of Adshead *et al.* (1992) that BASDEC is effective in screening for depression among non-demented elderly inpatients. BASDEC was considerably more sensitive than the geriatricians in detecting depression. Routine screening with BASDEC would help most non-psychiatrist clinicians to detect depression among their non-demented elderly inpatients whether they appear depressed or not.

### REFERENCES

- Adshead, R., Cody, D. D. and Pitt, B. (1992) BASDEC: A novel screening instrument for depression in elderly medical inpatients. *Brit. Med. J.* **305**, 397.
- Beck, A. T. and Beck, R. (1972) Screening depressed patients in family practice. *Postgrad. Med.* **52**, 81-85.
- Beck, A. T., Rial, W. Y. and Rickels, K. (1974) Short form of depression inventory: Cross validation. *Psychol. Rep.* **34**, 1184-1186.
- Bowers, J., Jorm, A. F., Henderson, S. and Harris, P. (1992) General practitioners' reported knowledge about depression and dementia in elderly patients. *Austral. NZ J. Psychiat.* **26**, 168-174.
- Burke, W. J., Houston, M. J., Boust, S. J. and Roccaforte, W. H. (1989) Use of the Geriatric Depression Scale in dementia of the Alzheimer type. *J. Am. Geriatr. Soc.* **37**, 856-860.
- Burke, W. J., Nitcher, R. L., Roccaforte, W. H. and Wengel, S. P. (1992) A prospective evaluation of the Geriatric Depression Scale in an outpatient geriatric assessment centre. *J. Am. Geriatr. Soc.* **40**, 1227-1230.
- Copeland, J. R. M., Dewey, M. E. and Griffiths-Jones, H. M. (1986) A computerised psychiatric diagnostic system and case nomenclature for elderly subjects: GMS and AGE-CAT. *Psychol. Med.* **16**, 89-99.
- Copeland, J. R. M., Dewey, M. E., Henderson, A. S. *et al.* (1988) The Geriatric Mental State (GMS) used in the community: Replication studies of the computerised diagnosis AGE-CAT. *Psychol. Med.* **18**, 219-223.
- Folstein, M. F., Folstein, S. E. and McHugh, P. R. (1975) 'Mini Mental State': A practical method for grading the cognitive state of patients for the clinician. *J. Psychiat. Res.* **12**, 189-198.
- Gallahan, C., Nienaber, N., Hendrie, H. and Tiernay, W. (1992) Depression of elderly outpatients: Primary care physician's attitudes and practice patterns. *J. Gen. Intern. Med.* **7**, 26-31.
- Gask, L., McGrath, G., Goldberg, D. P. *et al.* (1987) Improving the psychiatric skills of established general practitioners: Evaluation of group training. *Med. Educ.* **21**, 362-368.

Goff, D. and Jenike, M. (1986) Treatment resistant depression in the elderly. *J. Am. Geriatr. Soc.* **34**, 63-70.

Goldberg, D. P. (1985) Identifying psychiatric illness among general medical patients. *Brit. Med. J.* **291**, 161-162.

Hanley, J. A. and McNeil, B. J. (1982) The meaning and use of the area under a Receiver Operating Characteristics (ROC) curve. *Radiology* **143**, 29-36.

Hyer, L. and Blount, J. (1984) Concurrent and discriminant validities of the Geriatric Depression Scale with older psychiatric inpatients. *Psychol. Rep.* **54**, 611-616.

Jablensky, A. (1987) Prediction of the course and outcome of depression (Editorial). *Psychol. Med.* **17**, 1-9.

Kafonek, S., Ettinger, W. H., Roca, R. *et al.* (1989) Instruments for screening for depression and dementia in a long-term care facility. *J. Am. Geriatr. Soc.* **37**, 29-34.

Koenig, H. G., Meador, K. G., Cohen, H. J. and Blazer, D. G. (1992) Screening for depression in hospitalized elderly medical patients: Taking a closer look. *J. Am. Geriatr. Soc.* **40**, 1013-1017.

Lobo, A., Ventura, T. and Marco, C. (1990) Psychiatric morbidity among residents in a home for the elderly in Spain: Prevalence of disorder and validity of screening. *Int. J. Geriatr. Psychiat.* **5**, 83-91.

Lucas, C. P. (1992) The order effect: Reflections on the validity of multiple test presentations. *Psychol. Med.* **22**, 197-202.

NIH Consensus Development Panel on Depression in Late Life (1992) Diagnosis and treatment of depression in late life. *J. Am. Med. Assoc.* **268**, 1018-1024.

Norris, J. T., Gallagher, D. E., Wilson, A. *et al.* (1987) Assessment of depression in geriatric medical outpatients: The validity of two screening measures. *J. Am. Geriatr. Soc.* **35**, 989-995.

Olin, J. T., Schneider, L. S., Eaton, E. M. *et al.* (1992) The Geriatric Depression Scale and the Beck Depression Inventory as screening instruments in an older adult outpatient population. *Psychol. Assess.* **4**, 190-192.

Pond, C. D., Mant, A., Bridges-Webb, C. *et al.* (1990) Recognition of depression in the elderly: A comparison of general practitioner opinions and the Geriatric Depression Scale. *Fam. Practitioner* **7**, 190-194.

Rapp, S. R., Parisi, S. A., Walsh, D. A. and Wallace, C. E. (1988) Detecting depression in elderly medical inpatients. *J. Consult. Clin. Psychol.* **56**, 509-513.

Rey, J. M., Morris-Yates, A. and Stanislaw, H. (1992) Measuring the accuracy of diagnostic tests using Receiver Operating Characteristics (ROC) analysis. *Int. J. Meth. Psychiatr. Res.* **2**, 39-50.

Shah, A., Phongsathorn, V., George, C. *et al.* (1992) Psychiatric morbidity among continuing care geriatric inpatients. *Int. J. Geriatr. Psychiat.* **7**, 517-525.

Snowdon, J. (1990) Validity of the Geriatric Depression Scale. *J. Am. Geriatr. Soc.* **38**, 722-729.

Stukenberg, K. W., Dura, J. R. and Kiecolt-Glaser, J. K. (1990) Depression screening scale validation in an elderly, community-dwelling population. *Psychol. Assess.* **2**, 134-138.

Tombs, K. and Moum, T. (1993) How well can a few questionnaire items indicate anxiety and depression? *Acta Psychiatr. Scand.* **87**, 364-367.

Yesavage, J. A., Brink, T. L., Rose, T. L. *et al.* (1983) Development and validation of a geriatric depression screening scale: A preliminary report. *J. Psychiatr. Res.* **17**, 37-49.

APPENDIX 1

BASDEC score sheet

	True/false
1. I feel anxious all the time	1/0
2. I've felt very low lately	1/0
3. I feel worse at the beginning of the day	1/0
4. I feel life is hardly worth living	1/0
5. I've cried in the last month	1/0
6. I've given up hope	2/0
7. I've seriously considered suicide	2/0
8. I can't recall feeling happy in the past month	1/0
9. I'm so lonely	1/0
10. I've lost interest in things	1/0
11. I'm too miserable to enjoy anything	1/0
12. I have regrets about my past life	1/0
13. I am a nuisance to others being ill	1/0
14. I've been depressed for weeks at a time in the past	1/0
15. I suffer headaches	1/0
16. I seem to have lost my appetite	1/0
17. I'm not sleeping well	1/0
18. I'm kept awake by worry and unhappy thoughts	1/0
19. I'm not happy at all	1/0
Total	

APPENDIX B

SCL-5

	Answer
During the past 14 days, have you been bothered by:	
1. Feeling fearful?	1/2/3/4
2. Nervousness or shakiness inside?	1/2/3/4
3. Feeling hopeless about the future?	1/2/3/4
4. Feeling blue?	1/2/3/4
5. Worrying too much about things?	1/2/3/4
Total	

Note: 1 = not at all; 2 = a little; 3 = quite a lot; 4 = very much.