Diagnostic validity and added value of the Geriatric Depression Scale for depression in primary care: a meta-analysis of GDS30 and GDS15

Mitchell AJ, Bird V, Rizzo M, Meader N

CRD summary
This review concluded that the geriatric depression scale (GDS) yielded potential added value for the diagnosis of late-life depression in primary care, but only in the short form GDS15. Limitations in meta-analytic methods and reporting of the review process mean that this conclusion should be interpreted cautiously.

Authors' objectives
To assess the diagnostic accuracy and clinical utility of the geriatric depression scale (GDS) for the detection of depression in primary care and evaluate the added value of GDS compared to routine clinical identification by general practitioners (GPs).

Searching
MEDLINE and EMBASE were searched to May 2009. Search terms were reported. Science Direct, Ingenta Select, Ovid Full text, Blackwell-Wiley Interscience and Web of Knowledge were also searched.

Study selection
Studies that assessed the diagnostic performance of GDS in primary care for detection of depression (defined by a semi-structured psychiatric interview) in people aged 55 years or over were eligible for inclusion. Studies that assessed diagnostic abilities of general practitioners (without specific help from severity scales, diagnostic instruments, education programmes and collaborative care) in an equivalent population were included. Studies that did not report adequate (undefined) primary data were excluded.

Included study populations included 50% to 75% females. Mean ages were 61 to 79 years. Studies assessed any depression, major depression or major depression and subsyndromal depression. Reference standards used to confirm diagnosis were Diagnostic and Statistical Manual of Mental Disorders (DSM) editions III and IV, International Classification of Diseases-10 (ICD-10) and a computerised diagnostic system (AGECAT).

Studies were assessed for inclusion by two independent reviewers.

Assessment of study quality
The authors did not state that they assessed study validity.

Data extraction
Data were extracted on sensitivity, specificity, positive and negative predictive values and prevalence of depression. Data were extracted for the optimal diagnostic threshold (where a receiver operating characteristic curve was reported) or at the threshold used by the authors. Positive and negative clinical utility indices were calculated. One reviewer extracted data.

Methods of synthesis
Pooled estimates of sensitivity and specificity, with 95% confidence intervals (CIs) were calculated, using a random effects model where heterogeneity was moderate to high (not defined). These values were combined with mean prevalence data to estimate positive and negative predictive values. A Bayesian plot of conditional probabilities (all post-test probabilities from all pre-test probabilities across the prevalence spectrum) was reported.

Results of the review
Fourteen studies that reported 17 analyses of the diagnostic performance of GDS were included in the review. Seven studies (n=3,012 participants) assessed GDS30 and 10 studies (n=1,762) assessed GDS15. Based on psychiatric interview, overall prevalence of depression was 17.1%. Six diagnostic interview-based studies that assessed general practitioner
ability to detect late-life depression were included.

The pooled estimate of sensitivity for GDS$_{30}$ was 77.4% (95% CI 66.3% to 86.8%) and the corresponding pooled estimate of specificity was 65.4% (95% CI 44.2% to 83.8%). The pooled estimate of sensitivity for GDS$_{15}$ was 81.3% (95% CI 77.2% to 85.2%) and the corresponding pooled estimate of specificity was 78.4% (95% CI 71.2% to 84.8%). The positive clinical utility of both the GDS$_{30}$ and GDS$_{15}$ was rated as poor. However, the negative clinical utility of GDS$_{15}$ was rated as good and that of GDS$_{30}$ was rated adequate. Bayesian analysis suggested that GDS$_{15}$ was the optimal test.

The pooled estimate of sensitivity for unassisted general practitioner diagnosis of depression was 56.3% (95% CI 40.0% to 72.0%) and specificity was 73.6% (95% CI 71.7% to 75.5%).

When detection of depression using GDS was compared with general practitioners’ ability to diagnose late-life depression at a prevalence of 15%, GDS$_{30}$ had no added benefit and GDS$_{15}$ identified four additional cases per 100 and ruled-out an additional four non-cases per 100.

Authors’ conclusions
The GDS yielded potential added value in primary care, but only in the short form GDS$_{15}$. GDS$_{15}$ was likely to be more acceptable in primary care. Potential gains were only likely to bring actual patient benefit if a system was in place to help clinicians further assess and treat those who were identified.

CRD commentary
The review stated a clear research objective and defined appropriate inclusion criteria. Several sources were searched for relevant studies and unpublished data. The search strategies included a term for test accuracy studies, which may have led to relevant studies being missed. Measures were taken to minimise error and/or bias in study selection, but data extraction was performed by only one reviewer and no checking process was reported. No assessment of the methodological quality of included studies was reported. Thus, it was not possible to assess the potential impact on the results of the review of error and/or bias in the review process and weaknesses in the methodology of the included studies. Although stratified by index test, pooled estimates of test performance were calculated across studies that used various reference standards, definitions of depression and diagnostic thresholds; the validity of these pooled estimates was questionable.

Limitations in the meta-analytic methods and reporting of the review mean the authors' conclusions should be interpreted cautiously.

Implications of the review for practice and research
Practice: The authors recommend use of GDS$_{15}$ but not GDS$_{30}$ for diagnosis of late-life depression in primary care.

Research: The authors did not specify any recommendations for future research, but stated that refinement of GDS$_{15}$ may be possible and research results in primary care were awaited.

Funding
None stated.

Bibliographic details

PubMedID
19800132
Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.