

RESEARCH ARTICLE

Open Access

Diagnostic tools for alzheimer's disease dementia and other dementias: an overview of diagnostic test accuracy (DTA) systematic reviews

Ingrid Arevalo-Rodriguez^{1,2*}, Omar Segura¹, Ivan Solà³, Xavier Bonfill⁴, Erick Sanchez⁵ and Pablo Alonso-Coello⁴

Abstract

Background: Dementia includes a group of neurodegenerative disorders characterized by progressive loss of cognitive function and a decrease in the ability to perform activities of daily living. Systematic reviews of diagnostic test accuracy (DTA) focus on how well the index test detects patients with the disease in terms of figures such as sensitivity and specificity. Although DTA reviews about dementia are essential, at present there is no information about their quantity and quality.

Methods: We searched for DTA reviews in MEDLINE (1966–2013), EMBASE (1980–2013), *The Cochrane Library* (from its inception until December 2013) and the Database of Abstracts of Reviews of Effects (DARE). Two reviewers independently assessed the methodological quality of the reviews using the AMSTAR measurement tool, and the quality of the reporting using the PRISMA checklist. We describe the main characteristics of these reviews, including basic characteristics, type of dementia, and diagnostic test evaluated, and we summarize the AMSTAR and PRISMA scores.

Results: We selected 24 DTA systematic reviews. Only 10 reviews (41.6%), assessed the bias of included studies and few (33%) used this information to report the review results or to develop their conclusions. Only one review (4%) reported all methodological items suggested by the PRISMA tool. Assessing methodology quality by means of the AMSTAR tool, we found that six DTA reviews (25%) pooled primary data with the aid of methods that are used for intervention reviews, such as Mantel-Haenszel and separate random-effects models (25%), while five reviews (20.8%) assessed publication bias by means of funnel plots and/or Egger's Test.

Conclusions: Our assessment of these DTA reviews reveals that their quality, both in terms of methodology and reporting, is far from optimal. Assessing the quality of diagnostic evidence is fundamental to determining the validity of the operating characteristics of the index test and its usefulness in specific settings. The development of high quality DTA systematic reviews about dementia continues to be a challenge.

Keywords: Diagnosis, Dementia, Alzheimer's disease dementia, Systematic review, PRISMA checklist, AMSTAR tool

Background

Population ageing is generating a considerable increase in chronic and neurodegenerative diseases, as well as severe consequences for global public health [1,2]. Dementia includes a group of neurodegenerative disorders characterized by progressive loss of cognitive function as well as

the ability to perform activities of daily living, sometimes accompanied by neuropsychiatric symptoms [3]. Criteria for dementia diagnosis include a deficit in one or more cognitive domains that is severe enough to impair functional activities, and is progressive over a period of at least six months and not attributable to any other brain disease [4,5]. The presence of cognitive impairment, a fundamental part of the dementia profile, could be detected through a combination of history, clinical examination, and objective cognitive assessment such as a brief mental assessment or comprehensive neuropsychological testing [6,7]. At present,

* Correspondence: iarevalo@fucs.salud.edu.co

¹Division of Research, Fundación Universitaria de Ciencias de la Salud, Hospital de San José/Hospital Infantil de San José, Bogotá, DC, Colombia

²Pediatrics, Obstetrics & Gynecology and Preventive Medicine Department, Universitat Autònoma de Barcelona, Barcelona, Spain

Full list of author information is available at the end of the article