

Meta-epidemiologic analysis indicates that MEDLINE searches are sufficient for diagnostic test accuracy systematic reviews

Wynanda A. van Enst^{a,b,*,1}, Rob J.P.M. Scholten^{a,b,1}, Penny Whiting^{c,d}, Aeilko H. Zwinderman^b, Lotty Hooft^{a,b,1}

^aDutch Cochrane Center, Department of Clinical Epidemiology, Biostatistics and Bioinformatics, Academic Medical Center, Meibergdreef 9, 1100 DD, Amsterdam, The Netherlands

^bBiostatistics and Bioinformatics, Academic Medical Center, Meibergdreef 9, 1100 DD, Amsterdam, The Netherlands

^cKleijnen Systematic Reviews, Unit 6, Escrick Business Park, YO19 6FD, UK

^dSchool of Social and Community Medicine, University of Bristol, 39 Whatley Road, Bristol BS8 2PSB, UK

Accepted 21 May 2014; Published online 2 July 2014

Abstract

Objectives: To investigate how the summary estimates in diagnostic test accuracy (DTA) systematic reviews are affected when searches are limited to MEDLINE.

Study Design and Setting: A systematic search was performed to identify DTA reviews that had conducted exhaustive searches and included a meta-analysis. Primary studies included in selected reviews were assessed to determine whether they were indexed on MEDLINE. The effect of omitting non-MEDLINE studies from meta-analyses was investigated by calculating the summary relative diagnostic odds ratio (RDORS) = $DOR_{MEDLINE\ only} / DOR_{all\ studies}$. We also calculated the summary difference in sensitivity and specificity between all studies and only MEDLINE-indexed studies.

Results: Ten reviews contributing 15 meta-analyses met inclusion criteria for quantitative analysis. The RDOR comparing MEDLINE-only studies with all studies was 1.04 (95% confidence interval [CI], 0.95, 1.15). Summary estimates of sensitivity and specificity remained almost unchanged (difference in sensitivity: -0.08% ; 95% CI -1% to 1% ; difference in specificity: -0.1% ; 95% CI -0.8% to 1%).

Conclusion: Restricting to studies indexed on MEDLINE did not influence the summary estimates of the meta-analyses in our sample. In certain circumstances, for instance, when resources are limited, it may be appropriate to restrict searches to MEDLINE. However, the impact on individual reviews cannot be predicted. © 2014 Elsevier Inc. All rights reserved.

Keywords: Diagnostic test accuracy; Meta-analyses; Dissemination bias; Comprehensive searches; MEDLINE; Systematic review

1. Introduction

Systematic reviews of diagnostic test accuracy (DTA) studies are important to inform evidence-based use of diagnostic tests in clinical practice. A comprehensive search across multiple databases combined with screening the search results to identify studies for inclusion in the review is a key part of any systematic review [1,2]. This process can be time consuming and costly, especially for DTA reviews that often involve screening several thousand

references. Methods for efficient searching are therefore needed without introducing bias by missing relevant studies.

There are many electronic bibliographic databases that can be used to identify biomedical studies [3]. Most reviewers only search a small subset of the available databases, even in a comprehensive search. The best-known databases include MEDLINE and EMBASE. As from January 2010, MEDLINE records are included in EMBASE, whereas some EMBASE records are not covered by MEDLINE. EMBASE covers other journals especially drug therapy journals, more European journals, and more non-English journals compared with MEDLINE [4]. Regional databases like PASCAL and LILACS or specialized databases like PsychINFO may include studies additional to EMBASE and MEDLINE. Thus, if one of these databases is not searched when conducting a systematic review, there is a risk that some relevant studies will be missed.

Conflict of interest: We declare that we do not have any conflicting interests to declare. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

¹ Current address: Julius Center for Health Sciences and Primary Care, University Medical Center Utrecht, The Netherlands.

* Corresponding author. Tel.: +31 20 5663299; fax: +31 20 6965099.
E-mail address: avanenst@gmail.com (W.A. van Enst).

What is new?**Key findings**

- Less than half of the diagnostic test accuracy (DTA) systematic reviews (43%) included studies that are not indexed in MEDLINE.
- Omitting non-MEDLINE studies from the meta-analysis did not significantly hamper the diagnostic odds ratio, sensitivity, or specificity.

What this adds to what was known?

- This is the first metaepidemiologic evidence on the impact of search strategies for DTA systematic reviews.

What is the implication and what should change now?

- Empirical evidence indicates that searching in databases beyond MEDLINE for a DTA systematic review may no longer be regarded an absolute necessity to produce valid outcomes.

When time or financial resources are limited, simplifying the searches can be a practical solution. However, this may compromise the quality of the review by missing relevant studies. Much research has been done to develop search filters to enhance the precision of the search, defined as the number of relevant records identified by a search divided by the number of records identified. Therefore the number needed to read (NNR), defined as the number of records needed to read to find one relevant additional paper, can be reduced [5,6]. However, empirical evidence has found that even the most sensitive methodological filters for searching for DTA studies miss relevant studies [7,8].

Reducing the number of databases to be searched could reduce the amount of work involved in searching and also the NNR for screening search results and so be time and cost effective. In particular, costs will be reduced if only MEDLINE is searched, as this database is freely accessible through the PubMed interface. Empirical research has shown that excluding EMBASE when searching for randomized controlled trials (RCTs) will affect the results of intervention reviews. This is the consequence of a systematic difference between the two databases for RCTs. Trials that are indexed on MEDLINE on average find larger effects and have more significant results compared with studies indexed on EMBASE. Searching exclusively in MEDLINE may lead to an overestimation of the magnitude of treatment effects, which could affect patient management [9]. Although the publication process of trials is often dependent on identification of a significant effect, there is no such effect in diagnostic studies as the main outcomes are accuracy measures such as the diagnostic odds ratio (DOR), sensitivity, and specificity. Because of the

nature of these outcomes, it is not obvious to specify a hypothesis and test for it. Other factors may influence the publication process, but it is not clear whether these factors are associated with particular databases.

A previous review has shown that failure to search multiple databases to identify studies for inclusion in DTA reviews misses relevant studies [2]. However, this review did not investigate the impact of these missing studies on the results of the review. Restricting a review to studies indexed on a single database, for example MEDLINE, is only problematic if this leads to biased results. We would assume that reviews based exclusively on studies indexed on MEDLINE could have biased results if the results of those studies differ systematically from relevant studies indexed on other databases. We therefore aimed to assess whether restriction of databases influences the estimation of measures of accuracy in DTA reviews.

2. Methods*2.1. Identification of reviews*

MEDLINE was searched through the PubMed interface to identify DTA reviews published between January 2006 and January 2011. The methodological filter of Devillé [10] was applied to identify reviews covering diagnostic test accuracy combined with the review filter that is available in PubMed to identify systematic reviews. Search results were limited to 622 journals that had an impact factor ≥ 4 in 2010 [11] and were accessible through the medical library of the University of Amsterdam. The complete search strategy can be found in [Appendix A](#) at www.jclinepi.com. In addition, the Cochrane Database of Systematic Reviews was searched in March 2011 for all DTA reviews. The literature search and the presentation of the review was structured according to the PRISMA guidelines [12].

2.2. Inclusion criteria

We included reviews in which the authors evaluated the diagnostic accuracy of one or more tests against a reference standard and reported measures of accuracy: the DOR, sensitivity, and specificity. We only included DTA reviews that had conducted a meta-analysis and had searched MEDLINE and at least one other biomedical database. We excluded narrative reviews, genomic reviews, animal reviews, reviews that had applied a language or quality restriction, reviews that had assessed the analytical validity of tests, and reviews that only evaluated other measures of diagnostic performance such as reproducibility and reliability. Two reviewers independently assessed titles and abstracts of the references identified by the electronic search for relevance. Inclusion screening of full-text articles was conducted independently by two reviewers. A third reviewer was consulted in case of disagreement. Only meta-analyses that included both studies indexed on MEDLINE and studies not indexed on MEDLINE were included for further analysis.

Download English Version:

<https://daneshyari.com/en/article/10513652>

Download Persian Version:

<https://daneshyari.com/article/10513652>

[Daneshyari.com](https://daneshyari.com)