

Assessment of the Methodological Quality of Systematic Reviews Published in the Urological Literature From 1998 to 2008

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Abbreviations and Acronyms

AMSTAR = measurement tool to assess SRs

PRISMA = Preferred Reporting Items for SRs and Meta-Analyses

RCT = randomized, controlled trial

SR = systematic review

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Purpose: Well done systematic reviews provide the highest quality evidence for clinical questions of therapeutic effectiveness. We assessed the methodological quality of systematic reviews in the urological literature.

Materials and Methods: We systematically investigated all systematic reviews published in 4 major urological journals from 1998 to 2008. Studies were identified using a predefined search strategy in PubMed® and confirmed by a hand search of journal tables of contents. A validated 11-point instrument to assess the methodological quality of systematic reviews was applied by 2 independent reviewers after a pilot testing phase. Disagreements were discussed and resolved by consensus.

Results: The systematic literature search identified 217 individual systematic reviews, of which 57 ultimately met study eligibility criteria. Ten (17.5%), 20 (35.1%) and 27 (47.4%) systematic reviews were published in 1998 to 2001, 2002 to 2005 and 2006 to 2008, respectively. Using the measurement tool to assess systematic reviews the mean \pm SD score was 4.8 ± 2.0 points. Fewer than half of all systematic reviews performed a systematic literature search that included at least 2 databases (49.1%) or unpublished studies (31.6%), or provided a list of included and excluded studies (45.6%). Of the systematic reviews 63.2% assessed and documented the methodological quality of included studies. Systematic reviews with The Cochrane Collaboration authorship affiliation had a higher mean score than those with no such reported affiliation (6.5 ± 1.2 vs 4.4 ± 1.9 points, $p < 0.001$).

Conclusions: Results suggest that an increasing number of systematic reviews are published in the urological literature. However, many systematic reviews fail to meet established methodological standards, raising concerns about validity. Increased efforts are indicated to promote quality standards for performing systematic reviews among the authors and readership of the urological literature.

Key Words: urology, review literature as topic, methods, evidence-based medicine, periodicals as topic

SYSTEMATIC reviews have an important role in the hierarchy of evidence as potentially providing the highest quality evidence to guide individual clinical decision making and support clinical practice guidelines and health policy decisions.¹ They are defined as stud-

ies using explicit methods to identify, select, appraise and summarize primary studies to address a focused clinical question using methods to decrease the likelihood of bias.² The procedural steps involved in performing a high quality SR are well-defined,

largely thanks to the efforts of The Cochrane Collaboration.³

An increasing number of SRs appear to be published in the urological literature each year. This trend may reflect a greater awareness of their importance to evidence-based clinical practice as well as the fact that they are cited frequently and contribute favorably to the impact factor of a journal.⁴ To our knowledge what is unknown is whether the increased number of published SRs with time correlates with improved methodological quality. We assessed the methodological quality of SRs published in the urological literature and their evolution with time.

MATERIALS AND METHODS

Search Strategy

We searched PubMed to identify all SRs published in 4 major urological journals, including *The Journal of Urology*®, *European Urology*, *Urology*® and *BJU International*, from 1998 to 2008 using the Clinical Query function in PubMed.⁵ We also hand searched the table of contents of each journal for 2008 to verify that all SRs were indexed at the time of the literature search (March 13, 2009) and appropriately included. These urology journals were selected since they are read by a broad audience of general urologists and had the highest impact factors based on the Institute for Scientific Information's *Journal Citation Reports*. This methodology is consistent with that of prior publications.^{1,2}

Selection Criteria

Predefined study inclusion criteria were used to select articles. We included review studies that applied systematic methods to identify, select and summarize clinical research studies in humans relating to therapy and prevention. We excluded narrative reviews, clinical practice guidelines and meta-analyses that pooled individual studies without a literature search.

Data Extraction and Appraisal

As step 1, 1 of us (SF) screened and retrieved eligible articles using a sensitive search strategy with broad inclusion criteria that were established a priori in the study protocol. As step 2, based on full text publications 2 of us (SF and PD) independently reviewed the studies based on the full text publication and ultimately established eligibility in a consensus process. SR methodological quality was independently assessed by 2 of us (SM and SC) using AMSTAR, a validated 11-point instrument.^{6–8} Two of us (SM and SC) pilot tested AMSTAR on 2 sets of 4 SRs each to standardize use and eliminate inconsistency. Disagreements were resolved by discussion and ultimately by arbitration by 1 of us (PD). Study data were entered in a dedicated database.

End Points

Our primary aim was to provide a general descriptive assessment of the methodological quality of SRs published in these 4 journals from 1998 to 2008. According to

AMSTAR criteria we assigned a score of 1 when a criterion was met, and 0 when not met. For each SR a summary AMSTAR score was calculated using a score of 0 to 11 with higher values reflecting better methodological quality. SRs without a meta-analysis were limited to a maximum score of 9. We also evaluated whether SRs assessed the quality of evidence using established methodological safeguards against bias, such as appropriate randomization, allocation concealment, blinding, followup completeness and intent to treat analysis.¹

We defined 2 a priori hypotheses, including 1) SR methodological quality improved with time from 1998 to 2001, 2002 to 2005 and 2006 to 2008, and 2) SRs published by authors associated with a Cochrane Review Group were of higher quality. Publication year was based on the date of the first full text publication, which was usually online. Author association with a Cochrane Review Group was based on information provided in author affiliations. In an unplanned analysis we compared AMSTAR scores of SRs based only on RCTs, RCTs plus observational studies or observational studies only.

Statistical Methods

We calculated κ as a measure of interobserver agreement among reviewers.⁹ Measures of central tendency and distribution are shown as the mean \pm SD or median and IQR based on variable distribution. To compare methodological quality with time the 11-year study period was grouped into the 3 periods 1998 to 2001, 2002 to 2005 and 2006 to 2008. Statistical hypothesis testing was done with Student's t test and ANOVA. All statistical testing was 2-sided with predefined $\alpha = 0.05$ using SPSS®, version 16.0.

RESULTS

An initial PubMed search identified 217 articles, which were screened for eligibility. Of the articles 78 appeared to meet study inclusion criteria and were retrieved in full text, of which 57 ultimately met inclusion criteria and were included in analysis. Reasons for exclusion were meta-analysis without SR, guidelines, narrative reviews and studies not related to therapy/prevention.

Ten (17.5%), 20 (35.1%) and 27 (47.4%) SRs were published in 1998 to 2001, 2002 to 2005 and 2006 to 2008, respectively. The increased number of SRs was seen consistently across all 4 journals (fig. 1). Oncology (36.8%) and voiding dysfunction (36.8%) were the most common topics addressed (table 1). All except 3 SRs (94.7%) focused on adults and 21.6% SR authors were associated with a Cochrane Review Group. These SRs included a median of 15 studies (IQR 9, 25). Median sample size was 1,489 enrolled study subjects (IQR 877, 4,767).

Mean AMSTAR score was 4.8 ± 2.0 (range 1 to 8). Mean κ as a measure of interobserver agreement was 0.73 (range 0.44 to 0.93). Figure 2 lists the results of individual criteria. A large percent of articles explicitly reported an a priori study design,

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