

# Methodological Concerns and Quality Appraisal of Contemporary Systematic Reviews and Meta-Analyses in Pediatric Urology

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## Abbreviations and Acronyms

AMSTAR = Assessment of Multiple Systematic Reviews

MA = meta-analysis

SR = systematic review

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**Purpose:** The usefulness of systematic reviews and meta-analyses in influencing clinical practice depends on their quality. We sought to analyze the quality of published systematic reviews and meta-analyses in pediatric urology.

**Materials and Methods:** We searched PubMed (MEDLINE) and Embase for all systematic reviews and meta-analyses published in the top 5 pediatric urology journals between January 2000 and November 2009. Two reviewers independently selected articles for full text review. Scientific methodological quality was evaluated using the Assessment of Multiple Systematic Reviews 11-item tool.

**Results:** Of 267 initial results 220 articles were excluded because they were surveys, case reports or narrative reviews. Full text evaluation of the remaining 47 articles further excluded 32 series of exclusively adult patients, leaving 15 for final analysis. Seven articles (47%) were published in 2009 ( $p < 0.01$ ). Only 1 review (7%) described a full search strategy and 3 (20%) allowed inclusion of non-English studies. In 8 reviews (53%) selection of studies was performed by 2 reviewers. Five systematic reviews (33%) described some form of quality assessment. Only 5 reviews (33%) described assessment of publication bias, while 8 (53%) checked for heterogeneity among studies. According to AMSTAR criteria, 7 systematic reviews (47%) were considered of less than fair methodological quality, 5 (33%) fair to good quality and 3 (20%) good quality.

**Conclusions:** Despite a recent increase in the number of systematic reviews and meta-analyses published in pediatric urology journals, almost half of these reviews lack good scientific quality, raising concerns about their role in influencing clinical practice. Efforts should be made to improve the methodological quality of systematic reviews and meta-analyses in the pediatric urology literature.

**Key Words:** child, evidence-based medicine, meta-analysis as topic, review literature as topic, urology

SYSTEMATIC reviews provide a comprehensive collection and summary of all available studies relevant to a focused research question. Such reviews allow for better appraisal of the published data compared to traditional narrative reviews, detecting limitations that can be addressed in future studies. Nevertheless, these advantages rely heavily on high methodological quality and strict adoption of methods

to minimize bias. In this regard it is accepted that a high quality systematic review follow the strategies of 1) clear statement of a research question, 2) a priori definition of inclusion and exclusion criteria, 3) broad and well-defined search strategy, 4) selection of studies in duplicate, 5) quality assessment of included studies, 6) duplicate data extraction with collection of information on all a priori defined

outcomes, 7) careful analysis and presentation of results, and 8) discussion and explanation of heterogeneity.<sup>1</sup> Failure to follow these principles adversely affects the quality and conclusions of the review, which may erroneously influence clinical practice.

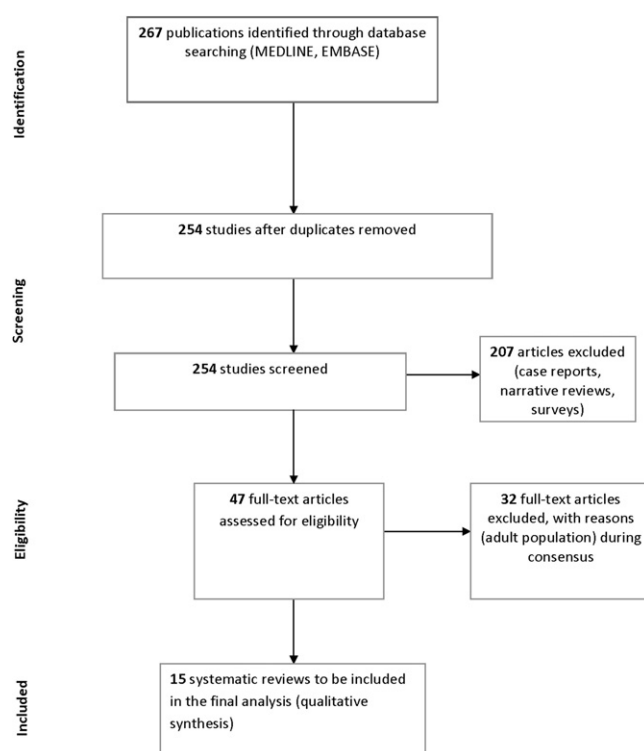
The number of published SRs and MAs has substantially increased in the last decade,<sup>1</sup> exposing a growing number of readers to this type of methodology. Interestingly the overall quality of these reviews has been highly variable and a fair number demonstrate important deficiencies.<sup>2</sup> These findings are concerning and underscore the importance of evaluating the quality of SRs in all fields. To our knowledge, a systematic evaluation of available SRs and MAs focusing on pediatric urology has not been conducted. We evaluated the methodological quality of such published work, checking whether the authors followed and reported the aforementioned strategies to minimize bias and errors. We hypothesize that despite widespread availability of guidelines and methodological recommendations,<sup>3,4</sup> varying levels of quality will be encountered.

## MATERIALS AND METHODS

We comprehensively searched the literature for all SRs and MAs published in 5 high impact specialty specific journals, consisting of *The Journal of Urology*®, *European Urology*, *Urology*, *BJU International* and *Journal of Pediatric Urology*, between January 2000 and November 2009. PubMed (MEDLINE) and Embase were used as search engines, and the search was limited to the terms “humans,” “meta-analysis,” “systematic review,” “historical article,” “English” and “all children: 0–18 years.”

All search results were included in the title and abstract screening, and the following inclusion criteria were applied. Articles were published between January 2000 and November 2009. Articles had to include pediatric patients. An article had to be identified as either SR or MA by the author in the title or text, or by indexing. Narrative reviews, surveys, historical reviews and case reports with review of the literature were excluded. Articles involving only adult patients were excluded as well, while articles involving adults and children were included. Article screening was conducted independently by 2 authors (LHB, JP) and all discrepancies were resolved by consensus.

Full text of each included article was obtained where possible. A data abstraction sheet was created and piloted, which included basic article characteristics such as journal, year, search strategy reported and study identification. Methodological quality was assessed using AMSTAR.<sup>5,6</sup> According to AMSTAR criteria, a score of 0 or 1 was assigned depending on whether a criterion was met. Additive scores for each SR were calculated ranging from 0 to 11, with higher values reflecting better methodological quality. Again, 2 authors (LHB, JP) independently abstracted the full text data and completed the methodological assessment tool. Consensus meetings were held



**Figure 1.** Selection of reviews included in study

in case of discrepancies. The  $\kappa$  statistic was used as a measure of interobserver agreement, with +1 indicating perfect agreement and –1 indicating absolute disagreement.

Following the 10-item Overview of Quality Assessment Questionnaire developed by Oxman and Guyatt,<sup>7</sup> we categorized the quality of the reviews. An AMSTAR rating of 4 or less was considered less than fair methodological quality, 5 to 8 was fair to good and 9 or greater was good.

## RESULTS

After initial review of titles and abstracts of 267 items we excluded 220 narrative reviews, historical articles, surveys and case reports. Subsequent full text evaluation of 47 articles resulted in further exclusion of 32 due to inappropriate age group (adults), leaving 15 studies suitable for final analysis (fig. 1). Agreement between abstractors was high ( $\kappa = 0.87$ , 95% CI 0.69 to 1.05). Of the articles 47% (7) were published in 2009, compared to 7% to 15% for previous years ( $p < 0.01$ ). A total of 12 SRs (80%) were exclusively pediatric, and 3 included pediatric and adult patients.<sup>8–22</sup>

Only 4 reviews (27%) had a clearly and properly stated research question as part of the review objective. We were able to identify inclusion and exclusion criteria in 12 reviews (80%). Less than 30% of all SRs described a systematic literature search that

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