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Comparison of Interventions in Pediatric Primary Vesicoureteral Reflux: A Network Meta-Analysis

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ADMINISTRATIVE INFORMATION

Support - No sponsors are included in this study.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 1 March 2025 and was last updated on 1 March 2025.

INTRODUCTION

Review question / Objective This study aims to evaluate and rank the effectiveness and safety of multiple treatments for pediatric primary vesicoureteral reflux (VUR) through a network meta-analysis.

Rationale There are multiple treatment options for pediatric primary VUR, but no comprehensive ranking based on comparative efficacy and safety. This study uses a network meta-analysis (NMA) to address this gap and inform clinical decision-making.

Condition being studied Pediatric primary vesicoureteral reflux (VUR) is a condition that may lead to recurrent urinary tract infections (UTIs) and kidney damage.

METHODS

Search strategy A systematic literature search was conducted following PRISMA guidelines across PubMed, Embase, and the Cochrane Library, from inception to October 31, 2024.

Participant or population Children and infants aged 0-18 years diagnosed with primary VUR.

Intervention Surgical reimplantation techniques (Lich-Gregoir, Politano-Leadbetter, and Cohen procedure), endoscopic treatments (Dx/HA, Macroplastique, PPC), and antibiotic prophylaxis.

Comparator Indirect comparisons among all interventions, including antibiotic-only control groups.

Study designs to be included Randomized controlled trials (RCTs).

Eligibility criteria Inclusion of RCTs involving pediatric primary VUR. Exclusion of non-RCTs, non-primary VUR studies, and adult populations.

Information sources PubMed, Embase, and the Cochrane Library.

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Main outcome(s) The success rate of every intervention.

Additional outcome(s) Recurrence rate and complication rate of every intervention.

Data management Data extraction and analysis were conducted using MetaInsight software.

Quality assessment / Risk of bias analysis The Risk of Bias 2.0 (RoB 2.0) tool was used to assess the risk of bias in the included studies.

Strategy of data synthesis Frequentist network meta-analysis with a random-effects model.

Subgroup analysis Subgroup analysis based on VUR grading, age groups, and treatment modalities.

Sensitivity analysis Sensitivity analysis excluding high-risk bias studies.

Language restriction Only English-language studies were included.

Country(ies) involved Taiwan - Taipei Medical University Hospital.

Other relevant information This is the first network meta-analysis of only RCTs comparing multiple pediatric VUR treatments.

Keywords Pediatric primary vesicoureteral reflux, network meta-analysis, randomized controlled trials.

Dissemination plans Planned submission to Journal of Pediatric Surgery (JPS).

Contributions of each author

Author 1 - Hsiao-Chien Ku - Author 1 drafted the study design, analysis and interpretation, data collection, writing of the article, statistical analysis, and critical appraisal of the studies included.
Email: 213020@h.tmu.edu.tw
Author 2 - Fu-Huan Huang - The author provided the study concept, results interpretation, statistical analysis, and critical appraisal of the studies included.
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