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INPLASY

Silodosin for the prevention of ureteral injury during flexible ureteroscopy: A systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Preliminary searches.

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 30 May 2026 and was last updated on 30 May 2026.

INTRODUCTION

Review question / Objective Population: Adult patients scheduled to undergo flexible ureteroscopy (fURS) for ureteral or renal calculi, regardless of sex or stone burden. Intervention: Preoperative oral administration of silodosin for a defined duration prior to fURS. Comparator: Placebo or no pretreatment. Outcomes: The primary outcome is the incidence of ureteral injury. Secondary outcomes include the stone-free rate (SFR), operative time, overall perioperative complication rate.

Condition being studied Urolithiasis affects 1%–20% of the global population, with a 5-year recurrence rate of approximately 50% following the first episode of renal colic, imposing a substantial burden on healthcare systems worldwide.Flexible ureteroscopy (fURS) is currently one of the most widely adopted minimally invasive techniques for upper urinary tract calculi. Advances in flexible ureteroscope technology and auxiliary devices have considerably expanded its indications. Reported stone-free rates (SFR) range from 70% to 90%, with a favorable complication profile and good patient tolerability. However, ureteral injury remains a clinically significant intraoperative complication of fURS. α_1-adrenoceptor antagonists relax distal ureteral smooth muscle and reduce intraluminal resistance. Silodosin exhibits approximately 38-fold greater selectivity for the α_1A-adrenoceptor subtype than tamsulosin, resulting in more pronounced reductions in ureteral tone, contractility, and peristaltic frequency. Preoperative silodosin may therefore facilitate UAS insertion and reduce intraoperative ureteral injury.This systematic review and meta-analysis aims to evaluate the efficacy and safety of preoperative silodosin in reducing ureteral injury incidence during fURS.

METHODS

Participant or population Adult patients scheduled to undergo flexible ureteroscopy (fURS).

Intervention Preoperative oral silodosin for a defined duration prior to fURS.

Comparator Placebo or no pretreatment.

Study designs to be included Randomized Controlled Trial.

Eligibility criteria Studies were eligible for inclusion if they met the following criteria: (1) original peer-reviewed articles published in full-text form; (2) randomized controlled trials (RCTs) ; (3) studies reporting at least one of the predefined outcomes.
Studies were excluded based on the following criteria: (1) case reports, narrative reviews, editorials, letters; (2) animal studies or in vitro experimental studies; (3) studies involving pediatric patients (aged <18 years); (4) duplicate publications or datasets.

Information sources A systematic literature search was conducted across four electronic databases, including PubMed, Cochrane Library, Embase, and Web of Science.

Main outcome(s) The primary outcomes of this meta-analysis were the incidence of ureteral wall injury.

Quality assessment / Risk of bias analysis The risk of bias of included randomized controlled trials were independently assessed by two reviewers using the Cochrane Risk of Bias tool version 2.0 (RoB 2.0), with disagreements resolved through discussion or third-party arbitration.

Strategy of data synthesis All statistical analyses were performed using Review Manager (RevMan, version 5.4, Cochrane Collaboration). Dichotomous outcomes were expressed as risk ratioodds ratios (RR) with 95% confidence intervals (CI), while continuous outcomes were expressed as mean differences (MD) with 95% CI. Heterogeneity was assessed using the I^2 statistic, with a random-effects model applied when I^2 >50%, and a fixed-effects model used otherwise.

Subgroup analysis Subgroup analysis was conducted according to the duration of preoperative silodosin administration.

Sensitivity analysis Subgroup analysis was conducted according to the duration of preoperative silodosin administration.

Country(ies) involved China.

Keywords Subgroup analysis was conducted according to the duration of preoperative silodosin administration.

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