Bipolar versus monopolar transurethral resection of the prostate: a systematic review and meta-analysis of randomized controlled trials
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CRD summary
This review concluded that no clinical differences in short-term efficacy existed between bipolar and monopolar transurethral resection of the prostate; bipolar was preferable due to lower transurethral resection syndrome, clot retention rates, shorter irrigation and catheterisation duration. This was a well-conducted review; despite poor study quality and limited follow-up the findings are likely to be reliable.

Authors' objectives
To compare bipolar transurethral resection of the prostate (B-TURP) with monopolar transurethral resection of the prostate (M-TURP) for benign prostatic obstruction.

Searching
MEDLINE, EMBASE, Science Citation Index and The Cochrane Library were searched without publication or language restrictions to February 2009; search terms were reported. Additional studies were sought from reference lists of included studies and manufacturer websites of available B-TURP systems.

Study selection
Randomised controlled trials (RCTs) that compared B-TURP with M-TURP for benign prostatic obstruction and reported either efficacy and/or safety were eligible for inclusion. Trials that assessed different interventions (such as transurethral vaporization of the prostate or transurethral vaporization-resection of the prostate or laser technology) non-RCTs and citations in abstract form were not eligible.

Primary outcomes included efficacy (maximum flow rate (Q-max), International Prostate Symptom Score, quality of life) and safety (adverse events). Secondary outcomes included operation time and duration of irrigation, catheterisation and hospitalisation. The most frequently used bipolar technology in the included studies was PlasmaKinetic technology; other studies used transurethral resection in saline and Vista Coblation/controlled tissue resection. Mean age of patients ranged from 59.0 to 73.8 years. Mean prostate volume ranged from 40.0mL to 56.5mL for most studies (82.5mL in one study).

Two reviewers independently selected studies for inclusion in the review; disagreements were resolved through discussion and consensus.

Assessment of study quality
Two reviewers independently undertook quality assessment of trials based on the Dutch Cochrane Collaboration checklist. This included items related to randomisation and allocation concealment, blinding, use of intention-to-treat analysis, withdrawals, sample size calculations and comparability of treatment. Disagreements were resolved through discussion and consensus.

Data extraction
Data for dichotomous outcomes were extracted to calculate risk differences (RD) and 95% confidence intervals (CIs). Means and standard deviations were extracted for continuous outcomes.

Two reviewers independently extracted data; discrepancies were resolved by discussion and consensus.

Methods of synthesis
Pooled risk differences and weighted mean differences (WMD), and their 95% CI, were calculated using a fixed-effect model. A random-effects model was used if heterogeneity was present. Heterogeneity was assessed using the I² test.
Results of the review
Sixteen RCTs (n=1,406, range 40 to 240) were included. Overall trial quality was low: computer-generated randomisation was used in two studies; allocation concealment was reported in eight studies; blinding of patients was stated in two studies and blinding of outcome assessors in five studies; and withdrawals were rarely reported. Follow-up in half of the studies was 12 months (range 0.7 to 48 months). There was no indication of publication bias.

For B-TURP compared with M-TURP at 12 months there were no clinically relevant differences in efficacy (Q(max) WMD 0.72mL/s, 95% CI 0.08 to 1.35; five studies). Treatment of 50 patients (95% CI 33 to 111) and 20 patients (95% CI 10 to 100) with B-TURP resulted in one fewer case of transurethral resection syndrome (RD 2.0%, 95% CI 0.9% to 3.0%; 15 studies) and one fewer case of clot retention (RD 5.0%, 95% CI 1.0% to 10%; seven studies). Moderate heterogeneity (I^2=49%) was present for the clot retention analysis and absent for other comparisons. There was no significant difference between: operation times; transfusion rates; retention rates after catheter removal; and urethral complications.

Compared with B-TURP, M-TURP resulted in significantly longer irrigation (WMD 8.75h, 95% CI 6.8 to 10.7; three studies).

Sensitivity analyses and subgroup analyses were reported.

Authors' conclusions
No clinically relevant differences in short-term efficacy existed between the two techniques; B-TURP was preferable due to a more favorable safety profile (lower TUR syndrome and clot retention rates) and shorter irrigation and catheterisation duration.

CRD commentary
The review addressed a clear question. Inclusion criteria were briefly defined in terms of study design, patients, intervention and outcomes. Several sources were searched without publication and language restrictions, which reduced potential for language and publication biases. Publication bias was assessed and considered to be absent. All stages of the review process were undertaken in duplicate, which reduced potential for error and bias. Appropriate criteria were used to assess the quality of the included observational studies, which were found to be generally of low quality. The chosen method of synthesis appeared appropriate given the absence of statistical heterogeneity. As acknowledged by the authors, the limited follow-up duration in the included studies may have restricted generalising the findings to longer study durations. This was generally a well-conducted review and the authors' conclusions appeared to reflect the available evidence. Despite the generally poor quality of the included studies, the findings are likely to be reliable.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that well-designed multicentric/international RCTs with follow-up of more than 12 months were required. A cost analysis was needed.

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