Local anesthetic reduces pain associated with transrectal ultrasound-guided prostate biopsy: a meta-analysis

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CRD summary
The authors concluded that periprostatic local anaesthetic significantly reduces pain in patients undergoing transrectal ultrasound-guided prostate biopsy. This was generally a well-conducted review and the authors’ conclusions are likely to be reliable. However, the size of the treatment effect did vary amongst the studies.

Authors’ objectives
To evaluate the efficacy of periprostatic local anaesthetic for reducing pain in patients undergoing transrectal ultrasound-guided (TRUS) prostate needle biopsy.

Searching
MEDLINE, the Cochrane CENTRAL Register and EMBASE were searched from inception to 2005; the search terms were reported. In addition, abstracts presented at the Annual Meeting of the American Urological Association from 2002 to 2005 were screened. Studies with non-English language titles and/or abstracts were excluded.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were eligible for inclusion in the review.

Specific interventions included in the review
Studies that compared periprostatic local anaesthetic with placebo or no treatment were eligible for inclusion. Studies that evaluated a combination of topical anaesthetic and local anaesthetic, or a combination of local anaesthetic and systematic analgesia, were excluded. The included studies used a variety of different periprostatic injection methods and anaesthetic types and doses (details were reported). The control treatments were placebo injection and no injection.

Participants included in the review
Studies of patients undergoing TRUS prostate needle biopsy were eligible for inclusion. The primary studies included patients with elevated prostate-specific antigens, abnormal findings on rectal examination and abnormal transrectal ultrasound findings.

Outcomes assessed in the review
Studies that assessed pain using a visual analogue scale (VAS) were eligible for inclusion. Studies had to report sufficient data to be included in the analysis. Most of the included studies used a 0 to 10 VAS.

How were decisions on the relevance of primary studies made?
At least two reviewers independently selected the studies. Any disagreements were resolved by discussion among the review group.

Assessment of study quality
Studies were assessed for reporting of randomisation method, blinding, inclusion and exclusion criteria, and sample size calculation. The authors did not state how the validity assessment was performed.

Data extraction
Two reviewers independently extracted the data. Any discrepancies were discussed and resolved by the review group. For each study, the mean pain score (with standard deviation or standard error) was extracted for each treatment group.

Methods of synthesis
How were the studies combined?
Pooled standardised mean differences (SMDs) and 95% confidence intervals (CI) were calculated using the random-effects model of DerSimonian and Laird. Publication bias was assessed using a funnel plot, and tested using the adjusted-rank correlation test of Begg and Mazumdar and the regression asymmetry test of Egger.

How were differences between studies investigated?
Statistical heterogeneity was assessed using the chi-squared test. A sensitivity analysis was performed by repeating the analysis after omitting each study in turn. Subgroup analyses explored the influence of the following factors on the results: lack of blinding, level of blinding, injection method, anaesthetic type and dose, and type of VAS.

Results of the review
Fourteen RCTs (n=1,583) were included.

Five studies reported the randomisation method. Four studies used double-blinding, three used single or partial blinding, and seven did not use blinding. Five studies did not report both inclusion and exclusion criteria. One study reported a sample size calculation.

Patients receiving periprostatic local anaesthetic reported significantly reduced pain compared with the control group (SMD -1.05, 95% CI: -1.40, -0.71, p<0.001). Significant statistical heterogeneity was found (p<0.001; tau-square 0.35, p<0.001).

There was no evidence of publication bias (funnel plot was symmetrical; Begg’s test p=0.29; Egger’s test p=0.71).

The sensitivity analysis showed slight changes in treatment effect size when studies were sequentially omitted, but the results remained statistically significant in favour of periprostatic local anaesthetic.

Subgroup analyses showed similar statistically significant results compared with the main analysis.

Authors’ conclusions
Periprostatic local anaesthetic significantly reduces pain in patients undergoing TRUS prostate needle biopsy.

CRD commentary
The review addressed a clear question that was defined in terms of the participants, intervention, outcomes and study design. Several relevant sources were searched and some attempts were made to minimise publication bias, although none were made to minimise language bias. The potential for publication bias was assessed and no evidence of it was found. Methods were used to minimise reviewer error and bias in the selection of studies and extraction of data, but it was unclear whether similar steps were taken at the validity assessment stage. Validity was assessed and the results of this assessment reported. Statistical heterogeneity was assessed and sensitivity analysis was used to examine the robustness of the results. Significant heterogeneity was found which indicated, as the authors stated, that although studies showed a consistent direction of treatment effect, they varied with respect to the size of the treatment effect. This was generally a well-conducted review and the authors’ conclusions are likely to be reliable.

Implications of the review for practice and research
Practice: The authors stated that the use of periprostatic local anaesthetic should be considered for patients undergoing TRUS prostate biopsy.

Research: The authors did not state any implications for further research.

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Not stated.

Bibliographic details
Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.