The results of transperineal versus transrectal prostate biopsy: a systematic review and meta-analysis

Shen PF, Zhu YC, Wei WR, Li YZ, Yang J, Li YT, Li DM, Wang J, Zeng H

CRD summary
This review concluded that transrectal prostate biopsy and transperineal prostate biopsy were equivalent in terms of efficiency and complications. No differences were found between procedures, but this did not necessarily mean that they were equivalent. Results should be treated with some caution given the inclusion of studies with a weaker design and poor quality trials.

Authors' objectives
To compare the efficacy and complications of transperineal and transrectal prostate biopsy.

Searching
The authors searched PUBMED, EMBASE, Cochrane Central Register of Controlled Trials (CENTRAL) and Cochrane Database of Systematic Reviews updated to 21 May 2011. Search terms were presented. Reference lists of identified reports, reviews and other relevant publications were also searched. A manual search was also conducted (no further details given). Studies in all languages were eligible.

Study selection
Randomised controlled trials (RCTs), quasi-randomised controlled trials, case-control studies and cohort studies were eligible if they compared the efficacy and safety of transperineal and transrectal prostate biopsy. Eligible participants were adult males who had elevated serum prostate-specific antigen (PSA) levels, abnormal digital rectal examination findings and/or abnormal transrectal ultrasonography findings. Some patients who previously underwent prostate biopsy and those who received saturation rebiopsy were also included. Patients with a previous history of prostate cancer, acute prostatitis or proven urinary tract infection were excluded. Prostate biopsy was conducted with the guidance of ultrasound and included sextant biopsy, extensive biopsy and saturation biopsy.

Mean age of included participants ranged from 64.4 to 72.5 years of age.

Two reviewers independently screened papers.

Assessment of study quality
The quality of RCTs was assessed according to Cochrane guidelines: randomisation, allocation concealment, description of withdrawals and drop-outs and intention-to-treat analysis. Non-RCTs were assessed using the Newcastle-Ottawa Scale. Scores of 5 to 9 were defined as high quality and a score of less than 5 was defined as low quality.

It was not clear how many reviewers were involved in the quality assessment.

Data extraction
Data on risk differences with 95% confidence intervals (CI) between transperineal and transrectal prostate biopsy were extracted independently by two reviewers using a pre-designed data extraction form with discrepancies resolved by consensus or by consultation with a third reviewer.

Methods of synthesis
Studies were grouped according to type of biopsy (sextant prostate biopsy, extensive prostate biopsy or saturation prostate biopsy). Studies were combined within these groups using random-effects meta-analysis to estimate the pooled risk difference and confidence intervals for cancer detection rate between transrectal prostate biopsy and transperineal prostate biopsy. Heterogeneity was assessed using $I^2$. Subgroup analysis was performed according to different PSA levels and digital rectal examination findings.

Results of the review
Seven studies were included in the review (2,218 participants), three RCTs and four case-control studies. All case-control studies were deemed high quality and all trials unclear in terms of randomisation and allocation concealment with a lack of blinding and intention-to-treat analysis.

There was no significant difference in cancer detection rate between sextant transrectal prostate biopsy and sextant transperineal prostate biopsy (RD = -0.02; 95% CI -0.08 to 0.03; I²=0%; two case control studies). There were no significant differences in cancer detection between groups according to PSA level and digital rectal examination findings. There was no significant difference in cancer detection rate between transrectal prostate biopsy and transperineal prostate biopsy in studies investigating extensive prostate biopsy (RD= -0.01; 95% CI -0.05 to 0.04; I²=9%; one case control study; three RCTs). There were no significant differences in cancer detection rates between groups according to PSA level and digital rectal examination findings in this group of studies. One case control study compared the rate of cancer detection between transrectal prostate biopsy and transperineal prostate biopsy in men undergoing a saturation prostate biopsy. There was no statistically significant difference in detection rate between procedures (31.4% vs. 25.7%; p=0.3).

Adverse event data were not pooled in meta-analysis but no significant differences in rates of adverse events were found between studies.

**Authors' conclusions**
Transrectal prostate biopsy and transperineal prostate biopsy were equivalent in terms of efficiency and complications.

**CRD commentary**
This review was underpinned by a search of electronic and other resources. Inclusion criteria were defined and quality was assessed. Two reviewers were involved in most of the review process which helped minimise bias. Meta-analysis was based on pooling RCTs and case-control studies which had differing levels of bias. All included RCTs were of poor quality which reduced the reliability of results. No differences were found between the interventions investigated, but this did not necessarily mean that they were equivalent. The authors' recommendation for further research appears appropriate.

**Implications of the review for practice and research**

**Practice:** The authors stated that transperineal prostate biopsy should be available to urologists as an alternative procedure.

**Research:** The authors stated that, due to the limited methodological quality of the included studies, additional multi-centre RCTs in this area were needed.

**Funding**
National Natural Science Foundation of China.

**Bibliographic details**

**PubMedID**
22101942

**DOI**
10.1038/aja.2011.130

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Biopsy /adverse effects /methods; Digital Rectal Examination; Humans; Male; Perineum; Prostate /pathology; Prostate-Specific Antigen /blood; Prostatic Neoplasms /blood /diagnosis /pathology; Rectum
AccessionNumber
12012015128

Date bibliographic record published
26/11/2012

Date abstract record published
20/03/2013

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.