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Prostatic arterial embolization for the treatment of lower urinary tract symptoms in men with benign prostatic hyperplasia (Review)

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WILEY

[Intervention Review]

Prostatic arterial embolization for the treatment of lower urinary tract symptoms in men with benign prostatic hyperplasia

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ABSTRACT

Background

A variety of minimally invasive surgical approaches are available as an alternative to transurethral resection of the prostate (TURP) for management of lower urinary tract symptoms (LUTS) in men with benign prostatic hyperplasia (BPH). Prostatic arterial embolization (PAE) is a relatively new, minimally invasive treatment approach.

Objectives

To assess the effects of PAE compared to other procedures for treatment of LUTS in men with BPH.

Search methods

We performed a comprehensive search using multiple databases (The Cochrane Library, MEDLINE, Embase, LILACS, Scopus, Web of Science, and Google Scholar), trials registries, other sources of grey literature, and conference proceedings with no restrictions on language of publication or publication status, up until 25 September 2020.

Selection criteria

We included parallel-group randomized controlled trials (RCTs), as well as non-randomized studies (NRS, limited to prospective cohort studies with concurrent comparison groups) enrolling men over the age of 40 with LUTS attributed to BPH undergoing PAE versus TURP or other surgical interventions.

Data collection and analysis

Two review authors independently classified studies for inclusion or exclusion and abstracted data from the included studies. We performed statistical analyses by using a random-effects model and interpreted them according to the *Cochrane Handbook for Systematic Reviews of Interventions*. We used GRADE guidance to rate the certainty of evidence of RCTs and NRSs.

Main results

We found data to inform two comparisons: PAE versus TURP (six RCTs and two NRSs), and PAE versus sham (one RCT). Mean age, IPSS, and prostate volume of participants were 66 years, 22.8, and 72.8 mL, respectively. This abstract focuses on the comparison of PAE versus TURP as the primary topic of interest.

PAE versus TURP

We included six RCTs and two NRSs with short-term (up to 12 months) follow-up and one RCT with long-term follow-up (13 to 24 months).

Short-term follow-up: based on RCT evidence, there may be little to no difference in urologic symptom score improvement (mean difference [MD] 1.55, 95% confidence interval [CI] -0.40 to 3.50; 369 participants; 6 RCTs; $I^2 = 75%$; low-certainty evidence) measured by the International Prostatic Symptom Score (IPSS) on a scale from 0 to 35, with higher scores indicating worse symptoms. There may be little to no difference in quality of life (MD 0.16, 95% CI -0.37 to 0.68; 309 participants; 5 RCTs; $I^2 = 56%$; low-certainty evidence) as measured by the IPSS quality of life question on a scale from 0 to 6, with higher scores indicating worse quality of life between PAE and TURP, respectively. While we are very uncertain about the effects of PAE on major adverse events (risk ratio [RR] 0.71, 95% CI 0.16 to 3.10; 250 participants; 4 RCTs; $I^2 = 26%$; very low-certainty evidence), PAE may increase re-treatments (RR 3.64, 95% CI 1.02 to 12.98; 204 participants; 3 RCTs; $I^2 = 0%$; low-certainty evidence). Based on 18 re-treatments per 1000 men in the TURP group, this corresponds to 47 more (0 more to 214 more) per 1000 men undergoing PAE.

We are very uncertain about the effects on erectile function (MD -0.03, 95% CI -6.35 to 6.29; 129 participants; 2 RCTs; $I^2 = 78%$; very low-certainty evidence) measured by the International Index of Erectile Function at 5 on a scale from 1 to 25, with higher scores indicating better function. NRS evidence when available yielded similar results. Based on evidence from NRS, PAE may reduce the occurrence of ejaculatory disorders (RR 0.51, 95% CI 0.35 to 0.73; 260 participants; 1 NRS; low-certainty evidence).

Longer-term follow-up: based on RCT evidence, we are very uncertain about the effects of PAE on urologic symptom scores (MD 0.30, 95% CI -3.17 to 3.77; 95 participants; very low-certainty evidence) compared to TURP. Quality of life may be similar (MD 0.20, 95% CI -0.49 to 0.89; 95 participants; low-certainty evidence). We are also very uncertain about major adverse events (RR 1.96, 95% CI 0.63 to 6.13; 107 participants; very low-certainty evidence). We did not find evidence on erectile function and ejaculatory disorders. Based on evidence from NRS, PAE may increase re-treatment rates (RR 1.51, 95% CI 0.43 to 5.29; 305 participants; low-certainty evidence); based on 56 re-treatments per 1000 men in the TURP group, this corresponds to 143 more (25 more to 430 more) per 1000 men in the PAE group.

Authors' conclusions

Compared to TURP up to 12 months (short-term follow-up), PAE may provide similar improvement in urologic symptom scores and quality of life. While we are very uncertain about major adverse events, PAE may increase re-treatment rates. We are uncertain about erectile function, but PAE may reduce ejaculatory disorders. Longer term (follow-up of 13 to 24 months), we are very uncertain as to how both procedures compare with regard to urologic symptom scores, but quality of life appears to be similar. We are very uncertain about major adverse events but PAE may increase re-treatments. We did not find longer term evidence on erectile function and ejaculatory disorders. Certainty of evidence for the main outcomes of this review was low or very low, signalling that our confidence in the reported effect size is limited or very limited, and that this topic should be better informed by future research.

PLAIN LANGUAGE SUMMARY

Prostatic arterial embolization for treatment of lower urinary tract symptoms in men with benign prostatic hyperplasia

Review question

What are the effects of a procedure that reduces blood flow to the prostate (called prostatic arterial embolization) in men with symptoms caused by an enlarged prostate?

Background

An enlarged prostate may cause difficulty with urination such as a weak stream or the need to urinate often during the day or at night. This can be treated by medications or by different types of surgery. One main type of surgery is called transurethral resection of the prostate. This involves going inside the urethra through the penis and removing prostate tissue. Prostatic arterial embolization is another form of treatment that works by stopping blood flow to parts of the prostate. We did this study to compare how prostatic arterial embolization compares to transurethral resection of the prostate and other procedures used in men with an enlarged prostate.

Study characteristics

We found eight studies that compared prostatic arterial embolization to transurethral resection of the prostate. In six of eight studies, so-called randomized trials, chance decided which group people were in. In the other two studies, the men themselves and their doctors decided. We also included one study that compared prostatic arterial embolization to a sham procedure (men were made to believe that

they received treatment, but in reality, they did not). We found no evidence comparing prostatic arterial embolization to other treatments than TURP.

Key results

Prostatic arterial embolization compared to transurethral resection of the prostate

Based on up to 12 months' follow-up (short term), prostatic arterial embolization and transurethral resection of the prostate may work similarly well in helping to relieve symptoms. Men's quality of life may also improve similarly. We are very uncertain about differences in major unwanted effects. Prostatic arterial embolization may increase the need for being treated again for the same problem. We are very uncertain as to any differences with regard to the need for an erection problem, but prostatic arterial embolization may reduce problems with ejaculation.

Based on 13 to 24 months' follow-up (longer term), we are very uncertain about the effects of prostatic arterial embolization on urinary symptoms compared to transurethral resection of the prostate. Quality of life may be similar. We are also very uncertain about the effects of prostatic arterial embolization on major unwanted effects. Prostatic arterial embolization may increase the need for another treatment. We found no data on erection or ejaculation problems.

Certainty of evidence

The certainty of evidence for all main outcomes was low or very low. This means that the true effect can be very different from what this review shows. Better, larger studies with longer follow-up are needed to better answer the question of how prostatic arterial embolization compares to other treatments.