

## THE LONG-TERM RELATIONSHIP BETWEEN A REAL CHANGE IN PROSTATE VOLUME AND A SIGNIFICANT CHANGE IN LOWER URINARY TRACT SYMPTOM SEVERITY IN INDIVIDUAL MEN: 4.2 YEARS FOLLOW-UP DATA FROM A POPULATION-BASED STUDY OF MEN AGED 50–78 YEARS

### Hypothesis / aims of study

The poor to moderate correlation between lower urinary tract symptom severity and prostate volume has been confirmed time and again, in clinical samples and in cross sectional and longitudinal population-based studies. Intuitively, longitudinal studies tracking the changes of relevant parameters simultaneously would be more likely to reveal a better correlation. However, the relationship between long-term changes in lower urinary tract symptoms and changes in prostate volume (PV) has not been studied extensively. We therefore investigated whether *real* changes in PV corresponded with *significant* changes in symptom severity, in a community-based study.

### Study design, materials and methods

We used the database of a large longitudinal community-based study in men aged 50–78 years. At baseline and at follow-up all participants filled out a 113-item self-administered questionnaire; this questionnaire included the International Prostate Symptom Score (IPSS). They subsequently underwent further measurements, including serum PSA, digital rectal examination (DRE) and transrectal ultrasound (TRUS), including determination of total prostate volume (PV). Specifically, the IPSS and PV were measured at baseline and at 4.2-year follow-up. 864 men completed both rounds, for an adjusted response rate of 63%. Since this is a closed cohort study, the number of eligible men for the follow-up rounds decreases with time, because men die, move out of the municipality, have been treated for prostate or bladder cancer or neurogenic bladder disease, or, based on the judgement of their general practitioner, have become too ill or unfit to make a visit to the outpatient clinic for multiple anatomical and physiological measurements. However, a separate analysis has shown that prostate volume was not related to loss to follow-up.

A *significant* change in IPSS was defined as a change of  $\geq 4$  points. Taking into account the intra- and inter-observer variation for PV measurement, a *real* change in PV was defined as a %-change of  $\geq 26\%$ , or an absolute change of  $\geq 10$ cc, in individual men. These definitions are based on a previous analysis of prostate volume measurements in this population based setting [1].

### Results

At baseline an IPSS of 0–7, 8–19 and  $\geq 20$  points, was found in 76.5%, 21.4% and 2.1%, respectively. The median PV was 30.2 cc (interquartile range: 24.9–37.8 cc) at baseline. Of the men, 48.5% had a PV greater than 30 cc. Men who were older at baseline had a greater increase from baseline in IPSS at 4.2 years. There was a 0.9-point increase in IPSS on average over 4.2 years, or 0.2 points per year of follow-up. Men with baseline IPSS in the “severe”-category improve on average, while those who are in the category “no or minor symptoms” deteriorate on average. Men in the different age strata between 50 and 69 years had a comparable increase in PV per year, ranging between 4.3 and 5.0 cc or 1.0–1.2 cc/year. After 4.2 years about 20% of the men had experienced a significant increase in IPSS and 16–23% had a real increase in PV. Only a small percentage of the men (<1.5%) showed a real decrease in prostate volume.

The odds ratio for a significant *increase* in symptom severity, contrasting men who have a real increase in PV and men who do not show such an increase is 1.38 [95% CI: 1.10–1.73]. The odds ratio for a significant *decrease* in symptom severity, contrasting men who did not have a real increase in PV and those who did show such an increase is 1.48 [95% CI: 1.19–2.62].

### Interpretation of results

Our results show that men with growing prostates are at a greater risk of symptomatic deterioration and that men who have prostates that do not grow significantly are more likely to improve symptomatically. However, the odds ratios found in our analysis are relatively small; this indicates that the clinical relevance of the association is limited.

### Concluding message

BPH can be characterized as a progressive problem in a small proportion of men above the age of 50 years, at best.

### References

1. Prostate 62: 353–363, 2005

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**HUMAN SUBJECTS:** This study was approved by the Medical Ethical Committee ErasmusMC and followed the Declaration of Helsinki Informed consent was obtained from the patients.