

ASSESSMENT OF THE PROGNOSTIC VALUE OF PSA

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ABSTRACT

Lower urinary tract symptoms (LUTS) often impair quality of life and lead to serious complications, including acute urinary retention (AUR), recurrent urinary tract infections, and prostate hemorrhage. Symptom severity is traditionally assessed using the International Prostate Symptom Score (IPSS), and prostate volume is measured by ultrasound. However, prostate volume alone does not always correlate with complication risk. PSA density (PSAD)—the ratio of total prostate-specific antigen (PSA) levels in the blood to prostate volume—is considered an informative marker for assessing malignancy risk, but its value in predicting BPH complications has been poorly studied, particularly in Russian and Central Asian populations.

PSA density assessment (PSA), calculated as the ratio of total PSA to prostate volume (0.15 ng/ml/cm^3 is considered normal), is a reliable prognostic marker in patients with BPH. PSA helps differentiate BPH from prostate cancer (PCA) more accurately than PSA alone and predict the risk of urinary retention or infectious complications after surgery.

The relevance of the study is due to the need to search for additional objective markers that help predict the severity of BPH and the risk of complications.

Purpose of the study. To evaluate PSA density in predicting the risk of complications in patients with BPH, and to compare PSAD with prostate volume data from ultrasound and the severity of symptoms according to the IPSS scale.

Material and research methods. A prospective clinical cohort study was conducted at the Fergana Urology Clinic. The study included 250 men with a confirmed diagnosis of BPH, with an average age of 66.3 ± 8.9 years.

Measurement methods used: prostate volume by ultrasound was calculated using the ellipsoid formula; PSA density (PSAD) was calculated as the ratio of total PSA (ng/mL) to prostate volume (cm^3); IPSS was a standardized LUTS assessment scale (0–35); complications were recorded: acute urinary retention (AUR), recurrent infections, and severe hematuria requiring treatment.

The statistical study included correlation analysis (Pearson's coefficient), logistic regression, and significance tests ($p < 0.05$). The analysis was conducted using SPSS v.22.

Results and discussion. The findings indicate that PSA density is a significant predictor of LUTS symptom severity and the risk of complications associated with BPH. Patients with a PSAD greater than 0.10 had higher IPSS scores and a significantly higher rate of complications.

This is consistent with several European and Russian studies in which elevated PSAD was associated with a progressive course of BPH. Importantly, PSAD provides additional information compared to prostate volume, as it takes into account the biochemical activity of the tissue relative to its size.

Correlations between PSAD and IPSS were higher than those between absolute prostate volume and IPSS, indicating a closer relationship between PSAD and clinical disease severity. Given that standard methods do not always predict complications, adding PSAD to the assessment may improve risk stratification and treatment planning.

Conclusions. PSA density correlates positively with the severity of lower urinary tract symptoms (as measured by the IPSS) and the incidence of complications in patients with BPH. PSAD above 0.10 ng/mL/cm³ is associated with significantly more severe LUTS and a higher risk of complications ($p < 0.001$). PSAD may serve as a useful additional marker of the risk of BPH complications in a comprehensive patient assessment.

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