Expression of PCA3 and PSA genes as a biomarker for differential diagnosis of nodular hyperplasia and prostate cancer

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ABSTRACT. We evaluated the expression of the PCA3 gene in urine from patients with nodular hyperplasia/benign prostatic hyperplasia (PNH) or adenocarcinoma type prostate cancer (PCa). The study included 59 men: 22 with PCa, 26 with PNH, and 11 with no alterations (controls). Patients’ urine was collected following prostatic massage and quantified by quantitative real-time PCR for prostate cancer antigen 3 gene (PCA3) and prostate-specific antigen gene (PSA) expression with the ACTB gene for normalization. PCA3 gene expression was detected in 16 patients with PCa and 4 with PNH; in the control group, there was no expression of the gene. No significant difference was observed in the mean levels of PCA3
and PSA expression, the PCA3/PSA ratio, and the total PSA levels when the groups of patients with PCa and PNH were compared. The area under the receiver operating characteristic (ROC) curve was 0.625, 0.596, 0.559, and 0.503 for PCA3 and PSA expression, the PCA3/PSA ratio, and total PSA levels, respectively. The sensitivity and specificity of the PCA3 test were 73 and 85%, respectively. Considering the estimated cutoff values (0.2219 and 0.5007 for PCA3 and PCA3/PSA, respectively), we observed a significant difference between the frequency of individuals with values above in the PCa group compared with the PNH group (P < 0.001). We conclude that the qualitative PCA3 test could be applied to initial screening for differentiation between individuals with PCa or PNH and those without prostate changes.

**Key words:** Prostate cancer; Nodular hyperplasia; **PCA3**; **PSA**; Gene expression