
Dokkyo Medical University School of Medicine, Dept. of Urology, Mibu, Japan

INTRODUCTION & OBJECTIVES: It is known that false-positive rate of PSA-based screening is very high. There is an urgent need for more accurate, noninvasive diagnostic testing for prostate cancer to avoid unnecessary prostate biopsies. We investigated several urine biomarkers for prostate cancer detection, compared with PCA3.

MATERIAL & METHODS: Urine samples were obtained from 62 patients, who needed prostate biopsy, with informed consent following a digital rectal exam (DRE) before either needle biopsy in our Hospital. After isolation of RNA from each sample, quantitative RT-PCR was performed to detect 14 prostate cancer biomarkers (PCA3, TMPRSS2-ERG, EZH2, CRISP3, GOLPH2, Mcm5, WDR19, PSGR, AGR2, IL-1a, FGFR2IIlb, FGFR2IIlc, FGF8 and FGF7) and the control transcripts PSA and GAPDH. The amount of PCR product was estimated by ΔCt method. The ΔCt value was normalized against urine PSA expression (ΔCt = CtPSA - Ct variable) and was used as urine biomarker value. When the sample indicated no expression of the urine marker, “Ct=50” was adopted as the expression value. Patients underwent systematic prostate needle biopsy (20 cores or more) with transrectal ultrasonography. Receiver observer characteristics (ROC) curve analysis of each urine biomarker was performed and area under the curve (AUC) was calculated. The cut-off level of each marker, sensitivity and specificity were estimated. Statistical analysis was performed with R.

RESULTS:

Thirty-five patients of prostate cancer were confirmed by needle biopsy and 27 patients were benign. The AUC of 5 markers was more than 0.6 (FGF7=0.748, FGFR2IIlb=0.701, PSGR=0.641, PCA3=0.634 and EZH2=0.601). But, the AUC of only 4 markers was more than 0.6 (FGF7=0.826, PCA3=0.717, GOLPH2=0.638 and TMPRSS2-ERG=0.606) in PSA gray zone (PSA<10, 17 positive and 23 negative biopsies). The sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and accuracy of FGF7 and PCA3 were shown in the Table. The ΔCt value of PCA3 was significantly higher in cancer group than in benign group (p<0.03). However, the ΔCt value of FGF7 was significantly lower in cancer group than in benign group (p<0.001). There was no significant difference between the AUC values of FGF7 and PCA3.

CONCLUSIONS: It was reported that higher expression of FGF7 was detected in prostate cancer than that in benign prostate hyperplasia.
tissues. However, FGF7 expression in urine sediment of prostate cancer patients was lower than that of benign group in this study. Lower expression of FGF7 in urine sediment may be a novel candidate of urine biomarker for prostate cancer detection.

[This study was supported by JSPS KAKENHI Grant Number 21592059.]