

THROMBOSPONDIN-1 AS A POTENTIAL BIOMARKER PREDICTING THE DEVELOPMENT OF BENIGN PROSTATIC HYPERPLASIA

Hypothesis / aims of study

Many factors affect the pathogenesis of benign prostatic hyperplasia (BPH). Previously, we reported that interleukin-18 (IL-18) may promote stromal hyperplasia in the prostate by inducing production of thrombospondin-1 (TSP-1) using BPH rat model and human cultured prostatic cells(1). Therefore, in this study, we aimed to determine the expression levels of IL-18 and TSP-1 in human prostate tissue and assess the roles of these expressions as biomarkers to diagnose the progression of BPH.

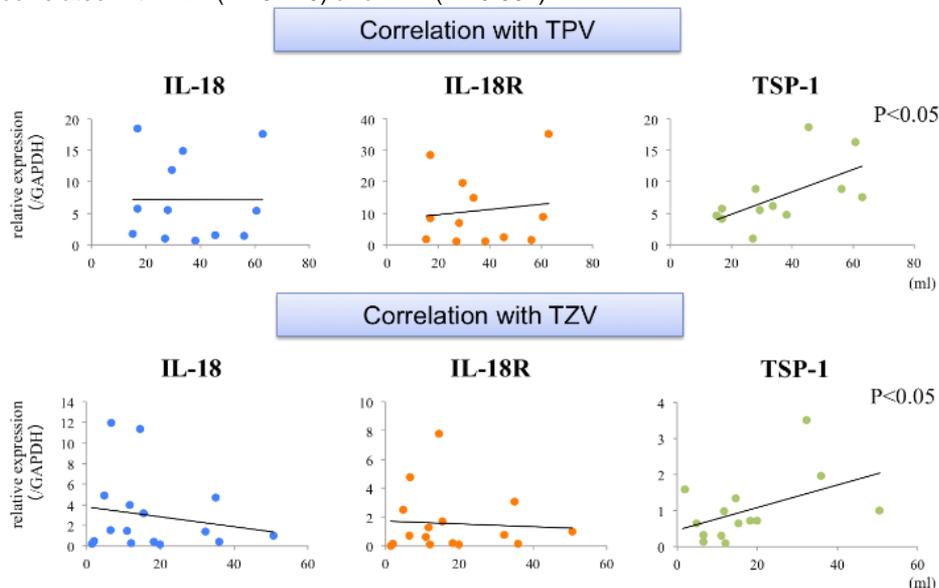
Study design, materials and methods

Study 1: We enrolled 16 patients without malignancy who underwent transperineal prostate biopsy at our institution. We obtained prostate tissues from the transitional zone and used these samples for total RNA extraction and cDNA preparation. The expression levels of IL-18 and TSP-1 mRNAs were evaluated by quantitative real-time reverse transcription polymerase chain reaction. We evaluated the correlation between mRNA expression levels and age, total prostate volume (TPV), transitional zone volume (TZV), transitional zone index (TZI), and serum PSA levels using Pearson's product-moment correlation coefficient.

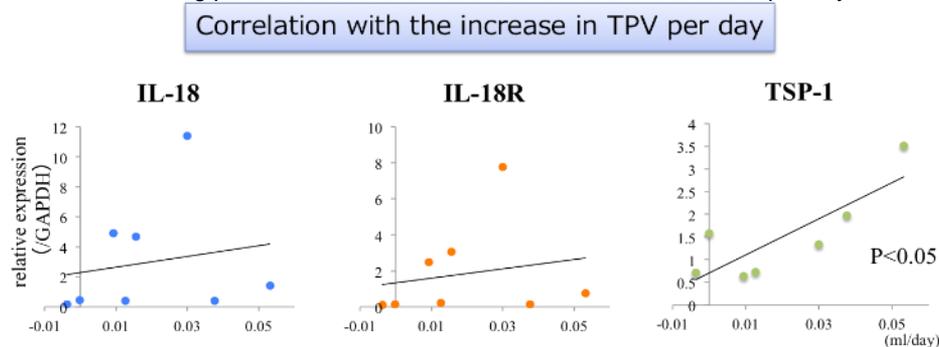
Study 2: Samples from eight of the patients in Study 1 were used to measure the volume of the prostate at biopsy and at a given point in time after biopsy. We evaluated the correlation between the increase in prostate volume per day and mRNA expression.

Results

Study 1: There were no correlations among age, serum PSA levels, and mRNA expression. TSP-1 expression was positively correlated with TZV ($r = 0.729$) and TPV ($r = 0.664$).



Study 2: The mean observation period was 853.1 ± 412.2 days, and the mean increase in prostate volume was 12.3 ± 12.5 mL. There was a strong positive correlation between the increase in volume per day and TSP-1 expression ($r = 0.717$).



Interpretation of results

TSP-1 is an extracellular matrix and has shown to be a regulator of angiogenesis and an activator of latent transforming growth factor beta (TGF- β). Previously, we reported that TSP-1 promoted the proliferation of prostatic stromal cells and it might induce

the development of prostatic stromal hyperplasia directly or indirectly. Thus, we speculated that high expression level of TSP-1 reflected large prostate size and the increment in prostate volume.

Concluding message

TSP-1 was positively correlated with prostate volume and the increase in prostate volume per day. This result suggested that TSP-1 may be a potential biomarker for predicting the development of BPH.

References

1. Hamakawa et al. Prostate. 74:590-601, 2014

Disclosures

Funding: NONE **Clinical Trial:** Yes **Public Registry:** No **RCT:** No **Subjects:** HUMAN **Ethics Committee:** The ethics committee of Nagoya City University Hospital **Helsinki:** Yes **Informed Consent:** Yes