The Value of Post-Biopsy PSA Ratio as a Predictive Factor of High Risk Prostate Cancer

Introduction and Objective: We previously reported that the post-biopsy prostate PSA increase is significantly greater in patients with benign prostatic hyperplasia than in those with prostate cancer. We investigated whether the post-biopsy PSA change may predict the severity of prostate cancer.
Materials and Methods: From January 2007 to July 2010, 294 patients with an initial diagnosis of prostate cancer were included. All patients underwent 10-core prostate needle biopsy, and serum PSA level was checked before (pre-PSA) and 60 minutes after biopsy (post-PSA). The PSA ratio defined as post-PSA/pre-PSA. We determined cut-off value of PSA ratio according to ROC curve and divided into two groups according to PSA ratio. Clinicopathologic outcomes were retrospectively analyzed between high PSA ratio and low PSA ratio groups by multivariate logistic regression analysis.
Results: The mean PSA ratio was 3.68, and cut-off value was 1.9 according to ROC curve (AUC 0.758, Sensitivity 80.4%, specificity 64.1%). Baseline PSA, Gleason score and T stage were significantly higher in low PSA ratio group (Table 1).
Conclusions: Our results suggest that low post-biopsy PSA ratio is important predictive factor of high risk prostate cancer and worse prognosis. This parameter may be valuable in the pretreatment risk assessment of prostate cancer.

Table 1. Clinical and oncologic characteristics between high PSA ratio and low PSA ratio groups

	PSA ratio<1.9 (n=150)	PSA ratio≧1.9 (n=144)	p-value
Mean age (years)	69.54±7.17	69.1±6.21	0.578
Mean BMI (kg/m^2)	23.38±2.45	23.51±2.28	0.661
Mean initial PSA (ng/ml)	50.7±38.18	14.33±8.44	<0.01
Mean prostate size (gm)	33.70±18.73	35.95±15.09	0.257
Prostate biopsy			
Gleason score	8 (6-10)	7 (6-9)	<0.001
Positive core	5.9 (1-10)	3.71 (1-10)	<0.001
Clinical stage			
≦T2	69	122	
≧T3	81	22	<0.001
LN involvement	7	2	0.097
Distant metastasis	21	7	0.006
Pathologic specimen	n=61	n=82	
Gleason score	7.52 (6-10)	7.07 (6-9)	0.004
T2	12	49	
≧T3	49	33	<0.001
Positive surgical margin	38	28	0.001
LN involvement	1	0	0.427
Follow-up period (mo)	21.46±8.15	20.05±7.33	0.149
PSA nadir			
Mean value (ng/ml)	0.12±0.05	0.10±0.07	0.768
Time to nadir (mo)	7.66±5.15	6.02±4.17	0.007
BCR after RP			
BCR (+)	6 (9.83%)	5 (6.09%)	0.302
Time to BCR (mo)	12±4.38	18±3.74	0.037

BMI: body mass index; PSA: prostate specific antigen; BCR: biochemical recurrence, RP: radical prostatectomy