P079 The expression and prognostic value of programmed death-ligand 1 in prostate needle biopsy tissue of prostate cancer patients undergoing primary radiation therapy

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Introduction & Objectives: Programmed death 1 (PD-1) and programmed death-ligand 1 (PD-L1) are potential new targets for the treatment of prostate cancer (PC) and their expression in prostatectomy tissue has been shown by multiple investigators. However, their expression in PC from needle biopsy specimen has not been revealed, which may be clinically important in patients undergoing primary radiotherapy (pRT).

Materials & Methods: All patients who were diagnosed with prostate cancer and underwent radiotherapy at the Ajou University Hospital from January 1999 to December 2015 with paraffin block tissue available were included. A median of 5 biopsy cores (1-13) per patient were available for staining. Three to four biopsy cores were mounted on each slide. Immunohistochemical staining was carried out on the Benchmark XT automatic staining device with incubation time of 32 min for PD-L1 (clone 22C3; Dako) and visualized with the OptiView DAB IHC Detection Kit (Ventana Medical Systems). The percentage of stained cells (0%, <1%, ≥1%) and intensity of staining (scaled 0 to 3) on cancer cell membrane were recorded for each biopsy core containing cancer.

Results: Total 1064 slides were examined from 171 patients, among which 971 slides contained at least 5% area of cancer. Key patient clinicopathological characteristics included mean age of 70 (50-82) years, mean PSA of 35.2 (1.0-340.0) ng/ml, Gleason score distribution of 13.5%, 28.1% and 58.4% for 6, 7 and ≥8, respectively and T stage distribution of 33.9%, 32.2% and 34.0, for stage ≤2, 3a and ≥3b, respectively. Among 971 slides, 60%, 25% and 15% showed 0%, <1% and ≥1% staining percentage, respectively, and 60%, 17%, 16% and 7% showed 0, 1, 2 and 3 staining intensity. When the slide with the highest staining percentage was taken as the representative value for each patient, 29%, 33% and 39% of patients showed 0%, <1% and ≥1% staining percentage, respectively. The expression of PD-L1 was stronger with higher Gleason scores, which was statistically significant (p=0.001). During mean follow-up of 94 months, biochemical recurrence (BCR) occurred in 38 of 171 patients and the 10-year BCR-free survival was 73%. When BCR-free survival was determined by the presence (>0%) or absence (0%) of PD-L1 expression, BCR-free survival were significantly worse in the PD-L1 positive group (p=0.036) with 10-year BCR-free survival rates of 67% and 82%, respectively.

Conclusions: We confirmed relatively low but definite PD-L1 expression in prostate needle biopsy specimen, especially with high Gleason score. Patients with high risk PC undergoing primary RT with positive PD-L1 expression may be potential candidates for PD-L1 inhibitor therapy at adjuvant/salvage setting in the future.