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Correlation of PD-L1 expression, clinicopathologic and molecular characteristics in an array of solid tumors: A large-scale real world study

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Background: Programmed death ligand-1 (PD-L1) is a predictive marker of anti-programmed death protein 1 (PD-1)/PD-L1 therapies for solid tumors. Limited literature exists correlating PD-L1 expression, clinicopathological & molecular profiles. We aimed to 1) correlate PD-L1 immunohistochemistry (IHC) results with these profile across multiple solid tumors & 2) assess clinical outcomes (overall survival (OS) & disease-free survival (DFS)) of PD-L1 status with / without anti-PD-L1 immunotherapy (IT).

Design: All cases tested for PD-L1 IHC over 2 years (Aug 2019-Sep 2020) were retrieved for this study. Clinicopathological variables recorded included age, race, tumor type, type of PD-L1 clone, PD-L1 status (Tumor Proportion Score (TPS): negative: <1%, low:1-49%, high: >50%), Combined Positive Score (CPS): negative <1, low 1-10, high > 10), clinical stage, anti-PD-L1 IT. Microsatellite instability (MSI) status using IHC & Ploymerase chain reaction (PCR) assays was recorded. High PD-L1 was defined as PD-L1 expression of TPS >50%/CPS>10. Outcome studies included OS and DFS after generating Kaplan-Meier curves & compared using log rank test. Univariate analysis using Cox regression models were also used.

Results: There were 205 cases tested for PD-L1 by IHC. Cohort included non-small cell lung cancers (127), head & neck carcinomas (37), gastric or gastroesophageal carcinoma (20), kidney or urothelial carcinoma (16), cervical carcinomas (5). Median age was 70 years (range 28-90). Most were high stage cancers [stage 1: 5/205, stage 2: 5/205, stage 3: 30/205, stage 4 165/205]. PD-L1 IHC clones included: 22C3 (152/205), 28-8 (21/205) & both (32/205). High PD-L1 expression was observed in 52/205 (25.3%), out of which [37/127 (29.1%) were adenocarcinoma, 13/54 (24%) were squamous cell carcinoma, 2/24 (4.1%) others]. Anti PD-L1 IT was given in 65/205 (31.7%) patients. Anti PD-L1 IT was significantly associated with longer median survival OS ($p=0.015$) & DFS ($p=0.004$) (Figure 1). PD-L1 status was significantly associated with OS ($p=0.034$) but not DFS ($p=0.076$) (Figure 1). High PD-L1 had shorter median survival and higher hazards of death in OS (HR=5.4, CI-1.3-23.1) irrespective of IT. Association between three groups of PD-L1 status when compared with IT was statistically significant ($p=0.048$, Figure 2). PD-L1 & MSI testing was available in 29 patients & did not show any statistical correlation in this small cohort. No significant difference in survival for those received IT (4/29) vs no IT (25/29) & tested for both PD-L1 & MSI (OS: $p=0.277$, DFS: $p=0.107$).

Figure 1 - 407

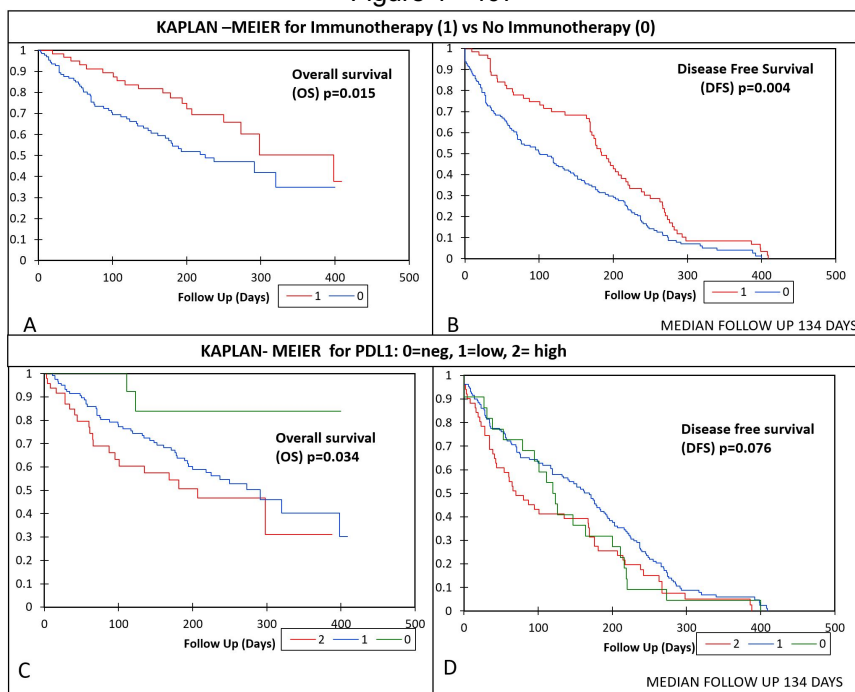


Figure 2 - 407

ANTI-PDL1 IMMUNOTHERAPY	NEGATIVE PDL1 TPS/CPS (<1%)	LOW PDL1 TPS(1-49%) CPS(1-10%)	HIGH PDL1 TPS >50% /CPS >10	TOTAL	CHI SQUARE TEST
YES	4	38	23	65	P= 0.048
NO	18	93	29	140	
TOTAL	22	131	52	205	

Conclusions: This study supports the rational approach for PD-L1 therapy. High PD-L1 expression is more commonly seen in adenocarcinoma. Expression of high PD-L1 is associated with worse OS but not DFS. PD-L1 IT is significantly associated with longer median survival, OS & DFS. Larger, prospective studies are needed to support our findings.

408 Expression of PD-L1 Antibody in Anal and Cervical Invasive Squamous Cell Carcinoma: Comparison of Two Clones

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Background: PD-L1 is an immunoregulatory molecule associated with adverse outcomes in several malignancies. Detection of PD-L1 by immunohistochemistry (IHC) on tumor cells is increasingly being integrated into the clinical management and for possible selection of patients who can respond to therapy. In this scenario, laboratories may have to explore which PD-L1 assays show the most reliable staining. The aim of this study was to compare the expression patterns of the commercially available Dako and Cell signaling (CS) PD-L1 antibody in anal and cervical invasive squamous cell carcinoma.

Design: 51 anal invasive squamous cell carcinoma cases (AISCC) and 73 cervical invasive squamous cell carcinoma (CISCC) cases were first stained using the Dako antibody (22C3 pharmDx). For AISCC, TPS was evaluated. TPS is the percentage of viable tumor cells showing positive staining. TPS= # of PD-L1 positive tumor cells/Total # of PD-L1 positive and PD-L1 negative tumor cells. For CISCC, a combined positive score (CPS) was evaluated. CPS = # PD-L1 staining cells (tumor cells, tumoral and peritumoral lymphocytes, macrophages) X 100/Total # of viable tumor cells. A subset (55 cases) was selected for comparison with the CS antibody (clone E1L3N, 1: 200 dilution). Cases stained by CS antibody included 10 cases of AISCC and 10 cases of CISCC that were PD-L1 negative by the Dako, antibody, the rest (35 cases) being PD-L1+ by Dako.

Results: See Table 1.

Anal ISCC: 18/51 (35%) of AISCC were PD-L1+ by the Dako antibody (Fig 1). By CS antibody (Fig 2), PD-L1 was positive in 40% of the Dako PD-L1+ cases. Six PD-L1+ cases with low TPS (1-10) by Dako were negative by CS antibody. Seven PD-L1+ cases with intermediate TPS (12-45) by Dako were positive but with lower TPS (1-20) by CS antibody.

Cervical ISCC: 30/73 (41%) of CISCC were PD-L1+ by the Dako antibody. By CS antibody, PD-L1 was positive in 35% of Dako PD-L1+ cases. Cases with lower CPS by the Dako antibody were seen to be negative by CS antibody. In cases PD-L1 + by the CS antibody, CPS scores were lower by the CS antibody compared with the Dako antibody.

Both in AISCC and CISCC, compared with the Dako antibody (Fig 1) cases that were PD-L1+ by the CS antibody had a lower intensity of staining (Fig 2).