Clinicopathologic Characteristics and Novel Biomarkers of Aggressive B-Cell Lymphomas in the Nasopharynx

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Background

Although extranodal NK/T cell lymphoma, nasal type is highly distinctive, the most common nasopharyngeal lymphomas in the United States are non-Hodgkin B-cell lymphomas (B-NHL), accounting for 75% of all cases. Relatively little is known about the clinicopathologic features of these cases. In this study, we characterize a multi-institutional cohort of aggressive B-NHL primary to the nasopharyngeal area. We compare and contrast cases which are Epstein-Barr Virus (EBV) positive versus EBV negative. Prior studies have shown that PD-L1 and SSTR2 (Somatostatin receptor 2), potential markers for targeted therapeutics, are expressed in subsets of lymphomas. In this study, we aim to evaluate the expression of PD-L1 and SSTR2 in nasopharyngeal B-NHLs in light of their EBV status.

AIM

To compare EBV+ and EBV- nasopharyngeal aggressive B-NHL with emphasis on the rapeutic biomarkers such as PD-L1, SSTR2, and CD30.

Results

Table 1. Characteristics of cases

Characteristics	EBV + (n =12)	EBV - (n=41)
Average age at diagnosis	62	65
Average Ki-67 (% positivity)	73.6	84.8
Average CMYC (% positivity)	15	45
Cell of Origin (% of tested cases)	NGC = 60% GC = 40%	NGC = 68% GC = 32%

NGC = Non-germinal center type; GC = Germinal center type

Representative EBV+ versus EBV- Cases

- Average expression of CMYC was higher for EBV- cases than EBV+ cases (45% vs 15%)
- CD30 more often seen in EBV+ cases than in EBV- cases.
- Six of 15 cases tested (40%) were positive for SSTR2.
- Seven of 14 cases tested (50%) demonstrated expression of PD-L1 within tumor cells with an average H-score of 56. The EBV+ DLBCL cases demonstrated substantial PD-L1 reactivity.

Conclusions

This initial clinicopathologic study of aggressive B-NHLs of the nasopharynx reveals some differences between EBV positive versus EBV negative cases. The association of EBV+ cases with expression of CD30 and PD-L1 is particularly informative in terms of potential targeted therapies. This data is in line with previous studies of PD-L1 expression in virus-associated B-cell malignancies. In addition, a significant number of these cases expressed SSTR2, which could render them susceptible to somatostatin analogue therapy and peptide receptor radionuclide therapy.

References

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Methods

Case Selection

We retrieved a total of 53 cases of aggressive B-NHL from the two institutions:
- 48 diffuse large B-cell lymphomas (DLBCL)
- 2 Burkitt lymphomas
- 2 high-grade B-cell lymphomas
- 1 plasmablastic lymphoma

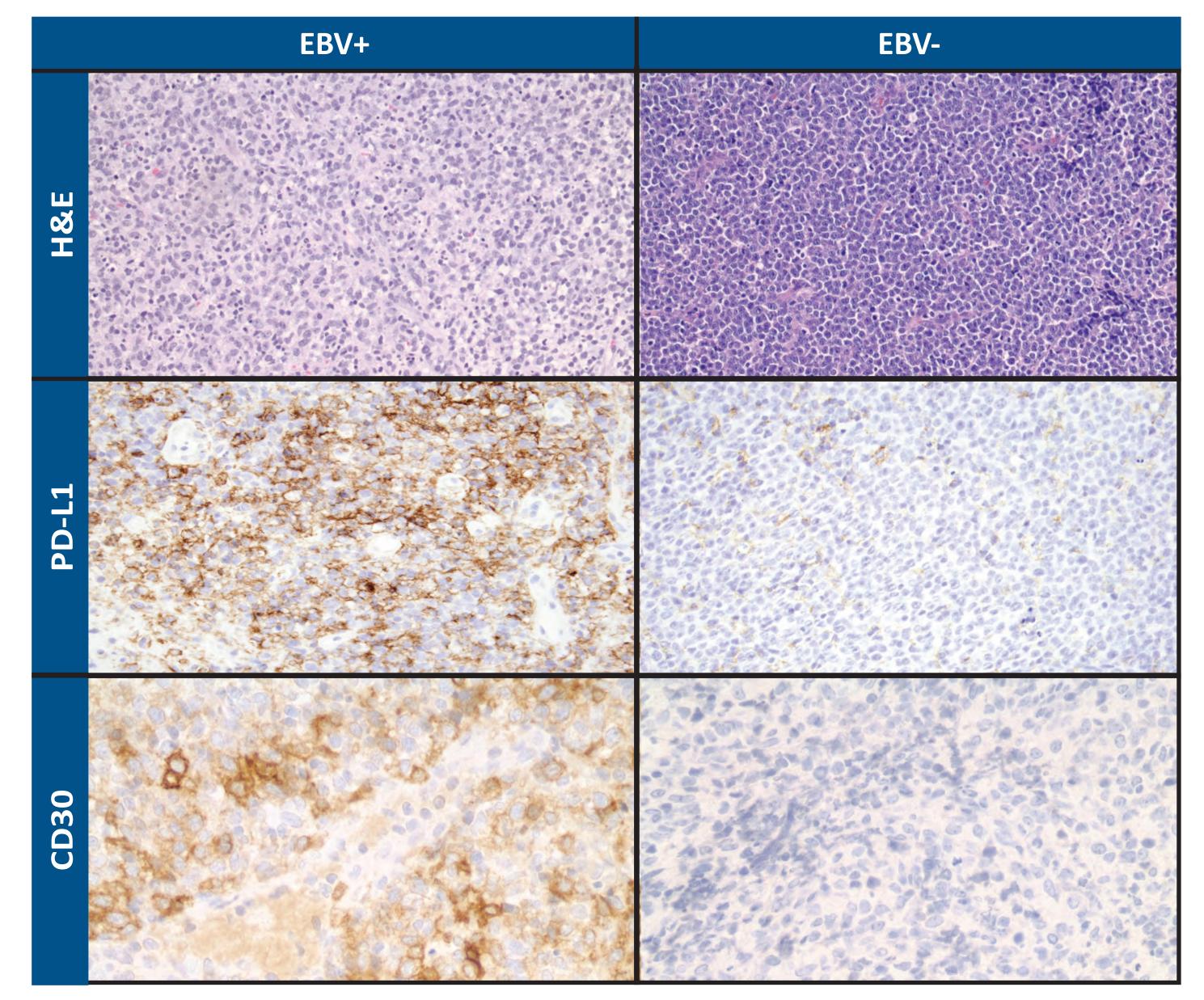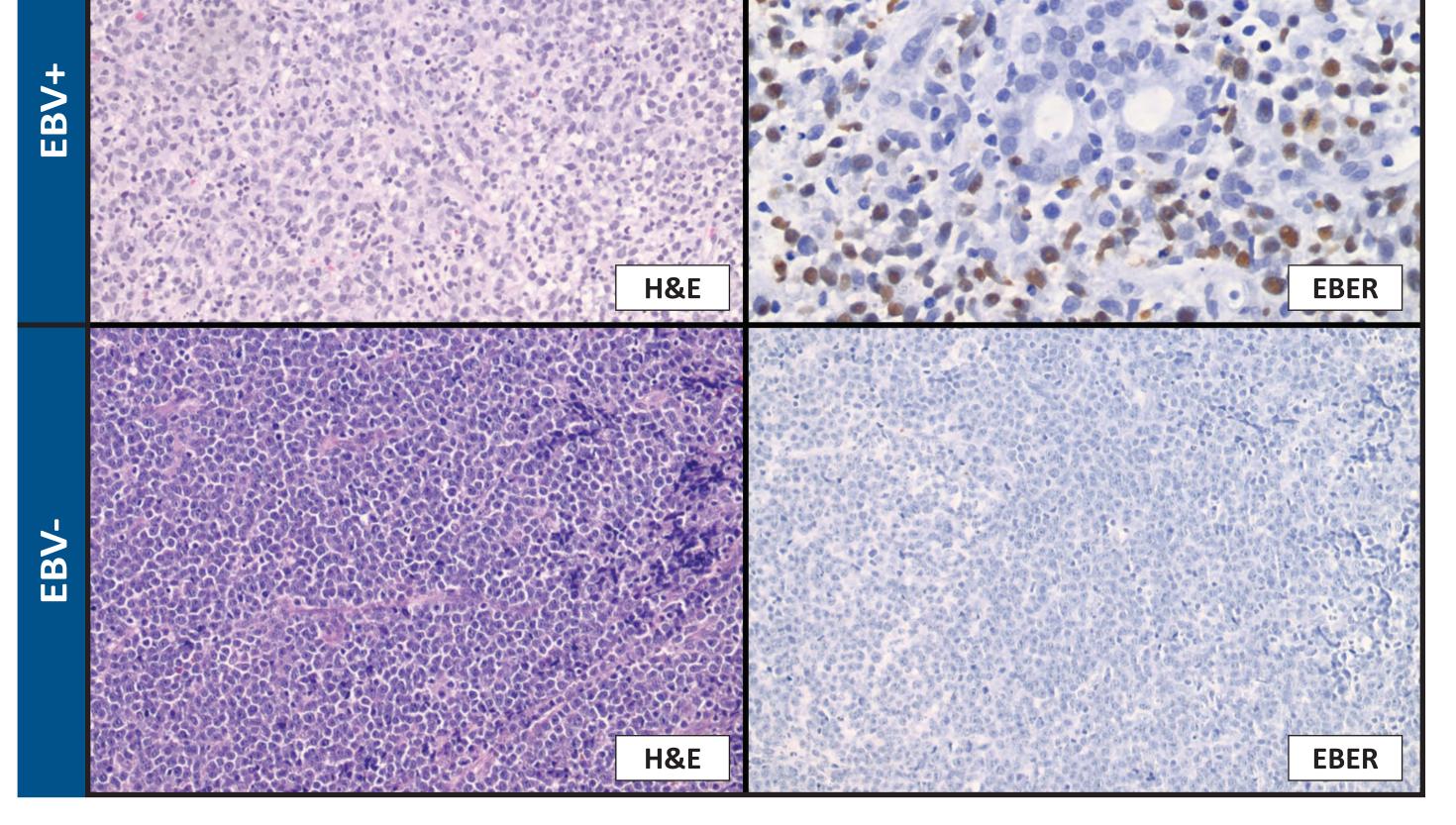Cases in which systemic lymphoma was found prior to or concurrently at initial diagnosis were excluded. All diagnoses were made according to contemporary WHO 2017 criteria using appropriate ancillary studies. For cases with available slides, staining was performed for in situ EBV (EBER), SSTR2 and PD-L1.

Scoring of PD-L1 Immunohistochemistry
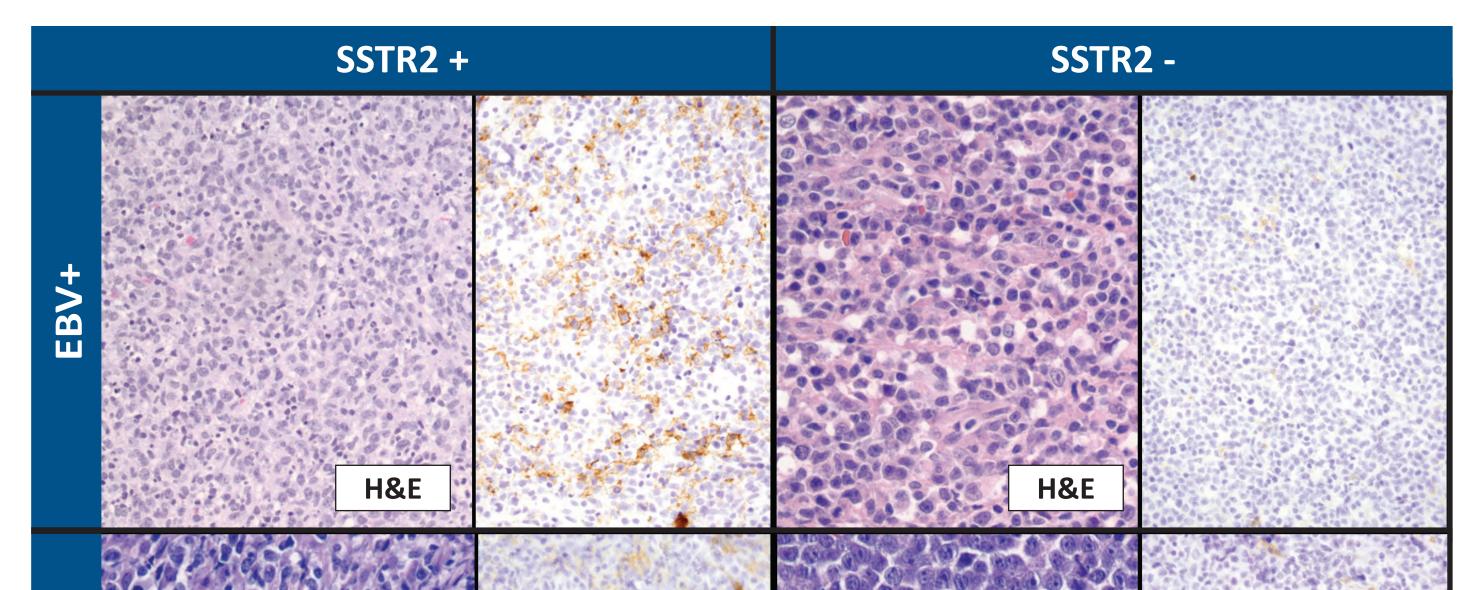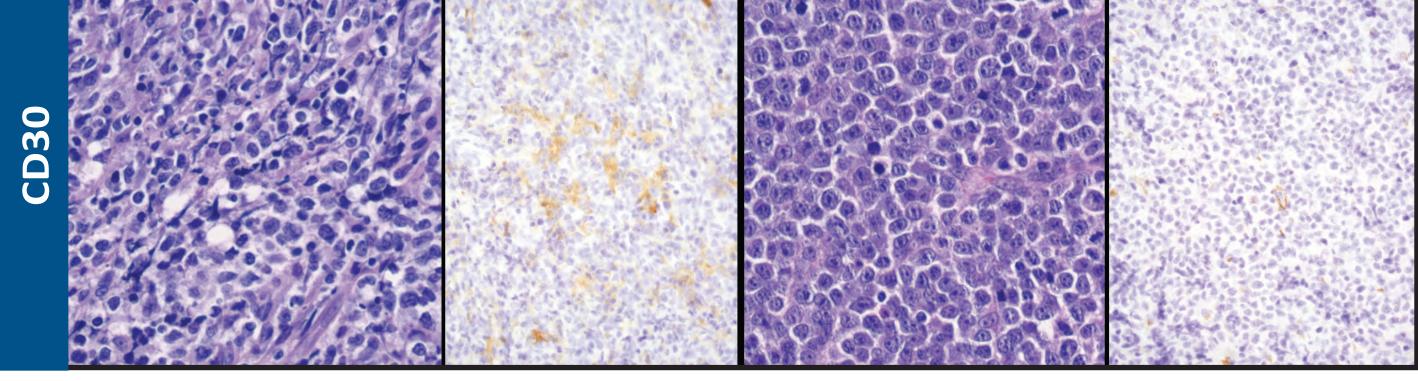
H score for PD-L1 = Intensity x % Positive
- Intensity is graded 1-3
- Minimum = 0 and maximum = 300

EBV-positive B-NHL is associated with higher PD-L1 and CD30 expression.

Six of 15 cases tested (40%) were positive for SSTR2, which are found in both EBV positive (top-left) and EBV negative (lower left) cases.