Prevalence and Characterization of EBV-Negative Post-Transplant Lymphoproliferative Disorder

Poster: ABCL-542

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Introduction/Background

A common and potentially fatal post-solid organ transplant (SOT) complication is post-transplant lymphoproliferative disorder (PTLD). The incidence has increased over the last two decades with significant morbidity and mortality. While the association of Epstein-Barr Virus (EBV) with the development of PTLD is well recognized, little is known about the etiology of EBV-negative PTLD.

Objective

To characterize the differences between EBV-positive and EBV-negative PTLD to better understand the pathogenesis of EBV-negative PTLD.

Methods

- Single, large academic center retrospective study that reviewed patients who developed PTLD after SOT.
- Data was collected on PTLD patients (>18 years) from 2011 to 2021.
- Data included demographics, SOT type, time from SOT to PTLD development, tumor EBV status, PTLD site, histopathological morphology, tumor markers, and overall survival.
- EBV tumor status was compared using $\chi 2$, Fisher's Exact, and Wilcoxon Rank Sum tests.

Results

A total of 99 patients met the inclusion criteria. Of those, 45.5% were EBV-positive and 54.5% were EBV-negative. Tumor EBV status did not differ by race, but males were more likely to be EBV-negative (63% v. 44.4% of females, p=0.065). EBV tumor status did not differ by SOT type.

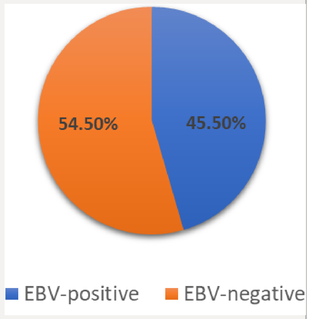


Figure 1: Distribution of EBV-Positive and EBV-Negative PTLD

- The interval between SOT and PTLD diagnosis was longer in EBV-negative patients (8.68 years) than EBV-positive patients (4.93 years) (p=0.001).
- There was a significant difference in EBV-negative PTLD site (p=0.046) and PTLD subtypes (p=0.002).
- Site of EBV-negative PTLD consisted of gastrointestinal (38.9%), head/neck (11.1%), liver/spleen (11.1%), CNS (3.7%), other lymph (24%), and other non-lymph (11.1%).
- Monomorphic (65.5%) and T-cell (90%) subtypes were more common in EBV-negative patients, compared to the polymorphic (15.4%) and plasmablastic/ plasmacytic (27.3%) subtypes.

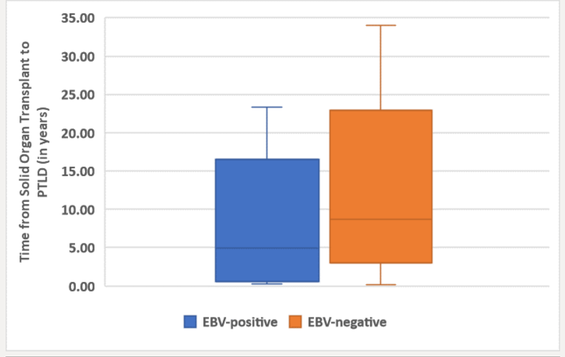


Figure 2: Time From SOT to PTLD Development in EBV-Positive and EBV-Negative PTLD

Morphologic Subtype	EBV-Positive (n=44)	EBV-Negative (n=54)	Total (n=99)
Monomorphic	20 (34.5%)	38 (65.5%)	58
Polymorphic	11 (84.6%)	2 (15.4%)	13
Hodgkin like	4 (66.6%)	2 (33.3%)	6
T-cell	1 (10%)	9 (90%)	10
Plasmacytic/ Plasmablastic	8 (72.7%)	3 (27.3%)	11
Unclassified	1 (100%)	0	1

Table 1: Distribution of histopathologic morphologies by tumor EBV status

Expression of CD20 did not differ by tumor EBV status. Those who were CD30-negative were more likely to be EBV-negative (90% v. 25%, p=<0.001). Those who were CD138-negative were more likely to be EBV-negative (75% v. 26.7%, p=0.012). There was no difference in overall survival by tumor EBV status.

Discussion/Conclusions

This single institution retrospective review shows that there are distinct differences between EBV-negative and EBV-positive PTLD. EBV-negative PTLD has a **longer interval from SOT to PTLD development**, **is more likely to occur in the gastrointestinal tract**, and **is more likely to have a monomorphic morphology**. Monomorphic morphologies are typically more aggressive, which is likely contributing to the difficulty associated with treating EBV-negative PTLD. It is important to note that EBV-negative PTLD was **more likely to be CD30 and CD138 negative**, which further limits targeted treatment options. It is surprising that there was no difference in overall survival in EBV-positive and EBV-negative PTLD.

Future direction: This study highlights the various differences seen with EBV-negative PTLD and demonstrates the need for more research on EBV-negative PTLD etiologies.

References

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