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# CLINICAL CHARACTERISTICS OF PATIENTS WITH PERIPHERAL T-CELL LYMPHOMA (PTCL) AND CONCOMITANT HEPATITIS B VIRUS (HBV) INFECTION

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## INTRODUCTION

Peripheral T-cell lymphoma (PTCL) comprises about 15% of non-Hodgkin lymphoma (NHL) cases worldwide. Studies have demonstrated that patients with hepatitis B virus infection (HBV) have a higher risk of developing NHL.[1,2] The mechanism of this association is not understood; however, HBV has been shown to infect both B and T cells.[3,4] HBV-associated diffuse large B-cell lymphoma (DLBCL) has been shown to have particular clinical characteristics and outcomes.[5]

## AIM

Although progress is being made in characterizing HBV-related B-cell lymphomas, we aim to determine whether HBV-associated PTCL is linked to particular clinical characteristics and outcomes.

## METHOD

We conducted a retrospective study at the Abramson Cancer Center, University of Pennsylvania in Philadelphia. PTCL diagnosed between 12/1/2010 and 5/1/2024 were identified using Epic Slicer Dicer. Eligibility included patients aged ≥18 years with pathologically confirmed PTCL-NOS, AITL/TFH, ALCL, ENKTL, HSTCL, SPTCL, MEITL or EATL, and HBV cAb positivity (HBV sAg +/-). Patients with HIV, HTLV-I/II, and/or only primary CTCL were excluded. Features at PTCL diagnosis and overall survival (OS) were collected.

## RESULTS

A total of 14 patients were identified as having a concomitant history of PTCL and HBV infection. Most (n=8) patients had AITL/TFH, 3 had PTCL-NOS, 2 had ALCL, and 1 had MEITL. All 3 of the PTCL-NOS cases presented only with splenic and bone marrow involvement, without fitting clear criteria for HSTCL. Seven of the 8 AITL/TFH patients were evaluable for extra-nodal (EN) disease and splenic involvement: 5 had EN disease and 6 had splenic involvement. Five of the 8 AITL/TFH patients had EBV viremia, 2 of whom also had concomitant large B-cell lymphoma. All patients were treated with HBV prophylaxis; none had HBV reactivation or transaminitis at diagnosis or during treatment. Two of the 14 patients had chronic HBV infection (HBV sAg +).

| AITL/TFH | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Patient | Age | Gender | OS (mo) | Stage | Nodal Disease | Splenic Disease | EN Disease | EN Location | Elevated LDH | Cirrhosis | HepB cAb | HepB sAg | HBV Viremia | HepC cAb | Disease Associated Variants on NGS |
| 1 | 69 | Female | 52 | 4 | Yes | Yes | Yes | Skin | Yes | No | Positive | Positive | Negative | Negative | NR |
| 2 | 75 | Female | 39 | 4 | Yes | Yes | Yes | BM | Yes | No | Positive | Negative | Negative | Negative | TET2 (p.S1441Mfs*7), TET2 (p.T556Nfs*11) |
| 3 | 69 | Male | NR | 3 | Yes | Yes | No | N/A | Yes | No | Positive | Negative | Negative | Negative | DNMT3A (p.R882H), TET2 (p.Q526*, p.T1554Sfs*1), U2AF1 (p.S34F) |
| 4 | 48 | Female | 47 | 3 | Yes | Yes | No | N/A | Yes | No | Positive | Negative | Negative | Negative | DNMT3A (p.G413Lfs*235), RHOA (p.G17V), TET2 (p.Q604*) |
| 5 | 54 | Male | NR | NR | Yes | NR | NR | NR | Yes | No | Positive | Negative | Negative | Negative | DNMT3A (p.R882H), TET2 (p.S1497*) |
| 6 | 72 | Male | 27 | 4 | Yes | No | Yes | Nasopharynx | Yes | No | Positive | Negative | Negative | Positive | NOTCH1 (p.Q2444*), TET2 (p.K1669Sfs*26 ), TNFRSF14 (p.? c.304+1G>A) |
| 7 | 57 | Female | 2 | 4 | Yes | Yes | Yes | BM, Liver | Yes | No | Positive | Positive | Negative | Negative | IDH2 (p.R172K) |
| 8 | 75 | Male | 18 | 4 | Yes | Yes | Yes | BM, Kidney, Testes | Yes | No | Positive | Negative | Negative | Negative | DNMT3A (p.R882H), TET2 (p.P1061Qfs*5) |
| **ALCL** | | | | | | | | | | | | | | | |
| Patient | Age | Gender | OS (mo) | Stage | Nodal Disease | Splenic Disease | EN Disease | EN Location | Elevated LDH | Cirrhosis | HepB cAb | HepB sAg | HBV Viremia | HepC cAb | Disease Associated Variants on NGS |
| 1 | 66 | Male | NR | 4 | Yes | Yes | Yes | BM | Yes | No | Positive | Negative | Negative | Negative | NR |
| 2 | 50 | Female | NR | 3 | Yes | No | No | N/A | Yes | No | Positive | Negative | Negative | Negative | NR |
| **MEITL** | | | | | | | | | | | | | | | |
| Patient | Age | Gender | OS (mo) | Stage | Nodal Disease | Splenic Disease | EN Disease | EN Location | Elevated LDH | Cirrhosis | HepB cAb | HepB sAg | HBV Viremia | HepC cAb | Disease Associated Variants on NGS |
| 1 | 68 | Male | 53 | 2 | No | No | Yes | Proximal jejunum | Yes | No | Positive | Negative | Negative | Negative | JAK3 (p.E958G) |

| PTCL-NOS | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Patient | Age | Gender | OS (mo) | Stage | Nodal Disease | Splenic Disease | EN Disease | EN Location | Elevated LDH | Cirrhosis | HepB cAb | HepB sAg | HBV Viremia | HepC cAb | Disease Associated Variants on NGS | Immunophenotype | FISH | Karyotype |
| 1 | 55 | Male | 4 | 4 | No | Yes | Yes | BM | No | No | Positive | Negative | Negative | Negative | FBXW7 (p.G423V), STAT5B (N642H) | CD2+ CD3+ CD4+ CD5- CD7- CD8- CD56- CD57- TCRa/b+ TCRg/d- | TCL1 neg, iso-7 neg | Normal |
| 2 | 43 | Female | 33 | 4 | No | Yes | Yes | BM | Yes | No | Positive | Negative | Negative | Negative | None Detected | CD2+ CD3+ CD4+ CD5+ CD7+ CD8+ CD56- TCRb+ TCR g/d- granzymb- perforin- EBER- | TCL1 neg, iso-7 NR | Normal |
| 3 | 44 | Male | NR | 4 | No | Yes | Yes | BM | NR | Yes | Positive | Positive | Negative | Negative | NR | CD3+ CD4- CD5- CD8- CD56+ TCRb- TCRd - granzymeb- perforin- TIA1+ EBER- | TCL1 neg, iso-7 neg | Normal |

***Table 1**: Clinical characteristics/outcomes of angioimmunoblastic T-cell lymphoma/T-follicular helper (AITL/TFH), anaplastic large cell lymphoma (ALCL), monomorphic epitheliotropic intestinal T-cell lymphoma (METIL) and peripheral T-cell lymphoma not-otherwise-specified (PTCL-NOS). NR: not reported, BM: bone marrow, NGS: next generation sequencing OS: overall survival.*

## CONCLUSIONS

Although a small sample size, most HBV-associated PTCL presented with EN and/or splenic involvement and involved AITL/TFH subtype. This entity warrants further investigation into this cohort's clinical characteristics, outcomes, and pathophysiology.

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## CONTACT INFORMATION

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