ELSEVIER

Blood 142 (2023) 3079–3082

The 65th ASH Annual Meeting Abstracts

POSTER ABSTRACTS

624.HODGKIN LYMPHOMAS AND T/NK CELL LYMPHOMAS: CLINICAL AND EPIDEMIOLOGICAL

Patterns of Care and Impact of Initial Treatment in Peripheral T-Cell Lymphoma: Outcome Analysis from the Lymphoma Epidemiology of Outcomes (LEO) and Molecular Epidemiology Resource (MER) Prospective Cohort Study

Jia Ruan, MD PhD[1], Zhengming Chen, PhD[2], Melissa C. Larson, MS[3], N. Nora Bennani, MD[4], Danielle Wallace, MD[5], Pamela B. Allen, MD[6], David L Jaye, MD[7], Jonathon B. Cohen, MDMS[8], Luis Enrique Malpica Castillo, MD[9], Francisco Vega, MDPhD[10], Giorgio Inghirami, MD[11], Eric Mou, MD[12], Carla Casulo, MD[13], Neha Mehta-Shah, MD[14], Peter Martin, MD[1], Matthew J. Maurer, DSc[15], Brad S. Kahl, MD[16], Izidore S. Lossos, MD[17], James R. Cerhan, MD PhD[15], Christopher R. Flowers, MD MS[18], Andrew L. Feldman, MD[19]

[1] Division of Hematology and Medical Oncology, Weill Cornell Medicine, New York, NY
[2] Weill Cornell medicine, New York, NY
[3] Department of Quantitative Health Sciences, Mayo Clinic College of Medicine, Rochester, MN
[4] Mayo Clinic, Rochester, MN
[5] Wilmot Cancer Insitute, University of Rochester Medical Center, Rochester, NY
[6] Winship Cancer Institute, Emory University, Atlanta, GA
[7] Department of Pathology and Laboratory Medicine, Emory University, Atlanta, GA
[8] Winship Cancer Institute, Emory University, Atlanta, GA
[9] Department of Lymphoma and Myeloma, University of Texas MD Anderson cancer Center, Houston, TX
[10] Department of Hematopathology, MD Anderson Cancer Center , Houston, TX
[11] Weill Cornell Medicine, New York, NY
[12] Division of Hematology, Oncology, and Blood & Marrow Transplantation, University of Iowa, Iowa City, IA
[13] Wilmot Cancer Center, University of Rochester, Rochester, NY
[14] Division of Oncology, Washington University School of Medicine, Saint Louis, MO
[15] Department of Quantitative Health Sciences, Mayo Clinic, Rochester, MN
[16] School of Medicine, Washington University in St. Louis, St Louis, MO
[17] Sylvester Comprehensive Cancer Center, Division of Hematology, University of Miami School of Medicine, Miami, FL
[18] Department of Lymphoma and Myeloma, The University of Texas MD Anderson Cancer Center, Houston, TX
[19] Department of Laboratory Medicine and Pathology, Division of Hematopathology, Mayo Clinic, Rochester, MN

Background
Peripheral T-cell lymphomas (PTCLs) comprise a rare, heterogeneous group of non-Hodgkin lymphomas of mature T-cell origin. Most systemic (s) PTCL subtypes typically have poor outcomes with conventional anthracycline-based chemotherapy. Biomarker-driven and subtype-specific treatments are promising but unmet needs. Few benchmark studies exist to characterize the current real-world landscape of clinical and pathologic practice. We report the patterns of care and updated outcome data for PTCL patients enrolled in the LEO-MER multi-center prospective cohort study (ClinicalTrials.gov NCT02736357).

Methods
Patients aged 18 years or older with newly diagnosed PTCL were prospectively enrolled in the University of Iowa/Mayo Clinic MER cohort (2002-2015) or the expanded LEO cohort (2015-2020). Clinical, pathology, treatment, and outcome data were abstracted from medical records using a standard protocol in both cohorts. Pathology underwent expert re-review based on WHO criteria. Overall survival (OS) was calculated from date of diagnosis to date of death or last follow-up. Event-free survival (EFS) was calculated from date of diagnosis to disease progression, initiation of 2 nd line therapy, or death from any cause. EFS and OS were evaluated using Cox model and Kaplan-Meier estimator. Log-rank test was used to test the significance of difference between groups.

Results
LEO-MER enrolled 1132 PTCL patients during the study period (462 MER and 670 LEO). Of these, 722 were sPTCLs (281 MER and 441 LEO), including PTCL-NOS (N=253, 35%), anaplastic large cell lymphoma (ALCL; N=180, 24.9% [74

ALK+, 106 ALK-]), angioimmunoblastic T-cell lymphoma (AITL, N=164, 22.7%), extranodal NK-TCL (N=50, 6.9%), adult T-cell leukemia/lymphoma (N=33, 4.6%), enteropathy-associated TCL (N=19, 2.6%), and hepatosplenic TCL (N=13, 1.8%) (**Table 1**). Median age at diagnosis was 60 years. M:F ratio was 1.5. Comparing LEO to MER, African American population was 15.4% vs 0.7%, and Hispanic was 10% vs 2.2%. Clinical characteristics were comparable between MER and LEO overall: PS≥2, 20.9%; elevated LDH, 50.7%; stage III-IV, 67.6%; and IPI 2-5, 65.7%.

The most common 1 st line chemotherapy regimens overall were CHOP-based (N=506, 70%), including 60% receiving CHOP-like chemotherapy in both MER and LEO cohorts (CHOP [N=268, 37%], CHOEP [N=91, 13%] or EPOCH [N=75, 10%]), and 16% with CHOP-like in combination with novel agents in LEO cohort (BV+ [N=41, 9.3%], azacitidine+ [N=11, 2.5%], pralatrexate+ [N=10, 2.3%], lenalidomide+ [N=8, 1.9%]) (**Table 1**). More patients received etoposide in LEO (40.3%) than in MER (20.3%). 74 patients (10.3%) underwent consolidative SCT following induction chemotherapy (71 auto and 3 allo). 65 patients (11.2%) received frontline therapy on clinical trials. At a median follow-up of 9.4 years in MER and 4 years in LEO, 177 (MER) and 269 (LEO) events, and 150 (MER) and 206 (LEO) deaths were observed, respectively. The 3-year EFS and 4-year OS estimates for sPTCL were 46.3% and 59.1% in MER, and 40.4% and 51.3% in LEO. EFS and OS correlated with IPI scores and differed by sPTCL subtypes (**Figure 1**). ALCL had superior survival, with 3-year EFS and 4-year OS of 78.2% and 90.5% for ALK+, and 65.9% and 76.9% for ALK-. Non-ALCL subtypes including PTCL-NOS and AITL had inferior outcomes, with 3-year EFS and 4-year OS of 31.4% and 42.8% for PTCL-NOS, and 33.4% and 50.7% for AITL. In subset analysis, the addition of etoposide to CHOP chemotherapy as either CHOEP or EPOCH was associated with improved OS for ALK- ALCL (p=0.038, log-rank), but not for ALK+ ALCL (p=0.75) or non-ALCL subtypes of PTCL-NOS and AITL (p=0.88).

Conclusion

The LEO-MER study is the largest prospective cohort study of PTCL to date. Patterns of care in the LEO cohort begin to incorporate novel agents in frontline therapy. Outcomes continue to mature with longitudinal follow-up and ongoing accrual, which poise to shape benchmarks in the contemporary era. The lack of benefit of etoposide adding to CHOP induction and poor overall survival of non-ALCL subtypes underscores the unmet need of therapeutic breakthrough for non-ALCL frontline treatment, particularly through clinical trials with biomarker-guided approaches incorporating novel agents.

Disclosures Ruan: *BMS:* Research Funding; *Genentech:* Research Funding; *Daiichi Sankyo:* Research Funding; *Secura Bio:* Consultancy; *AstraZeneca:* Consultancy, Research Funding. **Bennani:** *Acrotech:* Other: Advisory board; No personal compensation; *Acrotech:* Other: Scientific Advisory Committee, No personal compensation ; *Affimed:* Other: Advisory board; No personal compensation; *Secura Bio:* Other: Advisory board; No personal compensation; *Kymera:* Other: Advisory board; No personal compensation; *Astellas Pharma:* Other: Advisory board; No personal compensation. **Allen:** *Seattle Genetics:* Consultancy; *Secura Bio:* Consultancy; *Kyowa Kirin:* Consultancy; *Daiichi Sankyo:* Consultancy. **Cohen:** *BMS/Celgene:* Research Funding; *Novartis:* Research Funding; *Genentech:* Research Funding; *BioInvent:* Research Funding; *Lam Therapeutics:* Research Funding; *Takeda,:* Research Funding; *ADCT:* Consultancy; *AstraZeneca:* Consultancy, Research Funding; *Abbvie:* Consultancy; *Janssen:* Consultancy; *BeiGene:* Consultancy; *Loxo/Lilly:* Consultancy, Research Funding. **Vega:** *Allogene:* Research Funding; *Geron:* Research Funding. **Casulo:** *Verastem:* Research Funding; *Abbvie:* Consultancy; *GenMab:* Research Funding; *Gilead Sciences:* Research Funding; *SecuraBio:* Research Funding; *Follicular Lymphoma Foundation:* Other: Leadership role; *Bristol Myers Squibb:* Consultancy, Research Funding; *Lymphoma Research Foundation:* Other: Leadership Role; *Genentech:* Consultancy, Research Funding. **Mehta-Shah:** *Ono Pharmaceuticals:* Consultancy; *Corvus Pharmaceuticals:* Research Funding; *Genentech:* Consultancy; *Celgene:* Research Funding; *Kyowa Hakko:* Consultancy; *Daiichi Sankyo:* Consultancy, Research Funding; *AstraZeneca:* Consultancy, Research Funding; *C4 Therapeutics:* Consultancy, Research Funding; *Bristol Myers-Squibb:* Research Funding; *Genentech/Roche:* Research Funding; *Innate Pharmaceuticals:* Research Funding; *Secura Bio/Verastem:* Consultancy, Research Funding; *Karyopharm Therapeutics:* Consultancy; *Janssen:* Consultancy. **Martin:** *AbbVie, AstraZeneca, Beigene, Epizyme, Genentech, Gilead, Janssen, Pepromene, Daiichi Sankyo:* Consultancy. **Maurer:** *Adaptive Biotechnologies:* Membership on an entity's Board of Directors or advisory committees; *AstraZeneca:* Membership on an entity's Board of Directors or advisory committees; *BMS:* Consultancy, Research Funding; *Roche/Genentech:* Research Funding; *GenMab:* Membership on an entity's Board of Directors or advisory committees, Research Funding. **Kahl:** *BeiGene:* Consultancy, Honoraria, Research Funding; *Astra Zeneca:* Consultancy, Honoraria, Research Funding; *ADCT:* Consultancy, Honoraria, Research Funding; *Abbvie:* Consultancy, Honoraria; *Genentech:* Consultancy, Honoraria, Research Funding; *Janssen:* Consultancy, Honoraria; *Lilly:* Consultancy, Honoraria; *Gilead:* Consultancy, Honoraria; *Genmab:* Consultancy, Honoraria; *BMS:* Consultancy, Honoraria. **Lossos:** *LRF:* Membership on an entity's Board of Directors or advisory committees; *NCI:* Research Funding; *Adaptive:* Honoraria; *NCI:* Research Funding; *University of Miami:* Current Employment; *BeiGene:* Consultancy. **Cerhan:** *BMS:* Membership on an entity's Board of Directors or advisory committees, Research Funding; *NanoString:* Research Funding; *Genmab:* Research Funding; *Protagonist:* Other: Safety Monitoring Committee; *Genentech:* Research Funding. **Flowers:** *4D:* Research Funding; *Eastern Cooperative Oncology Group:* Research Funding; *Xencor:* Research Funding; *Burroghs Wellcome Fund:* Research Funding; *Adaptimmune:* Research Funding; *Acerta:* Research Funding; *SeaGen:* Consultancy; *Ziopharm:* Research Funding; *Spectrum:* Consultancy; *Allogene:* Research Funding; *Morphosys:* Research Funding; *Pfizer:* Research Funding; *Novartis:* Research Funding; *Nektar:* Research Funding; *Cellectis:* Research Funding; *Guardant:* Research Funding; *Iovance:* Research Funding; *Jannsen Pharmaceuticals:* Research Funding; *Sanofi:* Research Funding; *Pharmacyclics:* Research Funding; *Amgen:* Research Funding; *Takeda:* Research Funding; *TG Therapeutics:* Research Funding; *Karyopharm:* Consultancy; *Gilead:* Consultancy, Research Funding; *Genmab:* Consultancy; *Genentech Roche:* Consultancy, Research Funding; *Denovo Biopharma:* Consultancy; *Foresight Diagnostics:* Consultancy, Current holder of *stock options* in a

privately-held company; *Celgene:* Consultancy, Research Funding; *Beigene:* Consultancy; *Bayer:* Consultancy, Research Funding; *Abbvie:* Consultancy, Research Funding; *N-Power Medicine:* Consultancy, Current holder of *stock options* in a privately-held company; *Pharmacyclics Jansen:* Consultancy; *Kite:* Research Funding; *National Cancer Institute:* Research Funding; *V Foundation:* Research Funding; *CPRIT Scholar in Cancer Research:* Research Funding; *Cancer Prevention and Research Institute of Texas:* Research Funding.

https://doi.org/10.1182/blood-2023-180318

Table 1. LEO-MER PTCL Cohort Baseline Characteristics and Patterns of Care

	LEO (2015-2020)		MER (2001-2015)		Total	
Characteristic	**No. of Patients**	**Percent**	**No. of Patients**	**Percent**	**No. of Patients**	**Percent**
No. of Patients	441	100%	281	100%	722	100%
PTCL Subtypes						
Nodal						
PTCL-NOS	150	34.0%	103	36.7%	253	35.0%
AITL	98	22.2%	66	23.5%	164	22.7%
ALCL, ALK-	66	15.0%	40	14.2%	106	14.7%
ALCL, ALK+	41	9.3%	33	11.7%	74	10.2%
ENK-TCL	33	7.5%	17	6.0%	50	6.9%
EATL/MEITL	6	1.4%	15	5.3%	21	2.9%
HSTCL	10	2.3%	3	1.1%	13	1.8%
ATLL	29	6.6%	4	1.4%	33	4.6%
Gender						
Male	263	59.6%	173	61.6%	436	60.4%
Female	178	40.4%	108	38.4%	286	39.6%
Age, years						
Median (range)	60 (18-91)		58 (18-88)		60 (18-91)	
Race						
White	335	76.0%	247	91.5%	582	81.9%
African American	68	15.4%	2	0.7%	70	9.8%
Asian	16	3.6%	3	1.1%	19	2.7%
Ethnicity						
Hispanic	44	10.0%	6	2.2%	50	7.0%
Non-Hispanic	381	86.4%	224	83.0%	605	85.1%
ECOG Performance Status						
0-1	315	78.6%	222	79.9%	537	79.1%
≥2	86	21.4%	56	20.1%	142	20.9%
Ann Arbor Stage						
I-II	124	30.4%	97	35.4%	221	32.4%
III-IV	284	69.6%	177	64.6%	461	67.6%
LDH						
Normal	168	48.0%	124	51.2%	292	49.3%
Elevated	182	52.0%	118	48.8%	300	50.7%
IPI Risk Category						
0-1	95	31.1%	94	38.1%	189	34.2%
2	96	31.5%	57	23.1%	153	27.7%
3	75	24.6%	51	20.6%	126	22.8%
4-5	39	12.8%	45	18.2%	84	15.2%
Treatment						
CHOP-like chemo	238	54%	196	70%	434	60%
CHOP	103	23%	165	59%	268	37%
CHOEP	81	18%	10	3.6%	91	13%
EPOCH	54	12%	21	7.5%	75	10%
CHOP-like + Novel	71	16%	1	0.4%	72	10%
BV+CHP / CHEP	41	9.3%	0	0	41	5.7%
Aza+CHOP	11	2.5%	0	0	11	1.5%
PDX+CHOP	10	2.3%	0	0	10	1.4%
Len+CHOP/CHOEP/EPOCH	8	1.9%	1	0.4%	9	1.3%
Other						
ICE	9	2.2%	4	1.6%	13	1.8%
CEOP	6	1.4%	4	1.6%	10	1.4%
HyperCVAD	4	1.0%	5	2.0%	9	1.2%
SMILE	9	2.2%	0	0	9	1.2%
Survival						
Median follow-up (months)	47.8		112.1		70.6	
Events	269		177		446	
Deaths	206		150		356	
3-year EFS						
All	42.7% (95% CI:39.2%,46.6%)					
ALCL, ALK+	78.2% (95% CI: 69.3%,88.2%)					
ALCL, ALK-	65.9% (95% CI: 57.2%,76.0%)					
PTCL-NOS	31.4% (95% CI: 26.0%,37.9%)					
AITL	33.4% (95% CI: 26.9%,41.5%)					
4-year OS						
All	54.8% (95% CI:51.1%,58.7%)					
ALCL, ALK+	90.5% (95% CI: 84.0%,97.4%)					
ALCL, ALK-	76.9% (95% CI: 68.8%,86.0%)					
PTCL-NOS	42.8% (95% CI: 36.9%,49.6%)					
AITL	50.7% (95% CI: 43.4%,59.2%)					

Abbreviations: PTCL-NOS – peripheral T-cell lymphoma, not otherwise specified; AITL- angioimmunoblastic T-cell lymphoma; ALCL – anaplastic large cell lymphoma; ENK-TCL – extranodal NK/T cell lymphoma; HSTCL – hepatosplenic T cell lymphoma; EATL – enteropathy-associated T cell lymphoma; MEITL – monomorphic epitheliotropic intestinal T-cell lymphoma; ATLL – adult T-cell lymphoma/leukemia; ECOG – Eastern Clinical Oncology Group; LDH – lactate dehydrogenase; IPI – international prognostic index; BV – brentuximab vedotin; Aza – azacitadine; PDX – pralatrexate; EFS – event-free survival; OS – overall survival.

Figure 1. LEO-MER PTCL Cohort Overall Survival by Classification

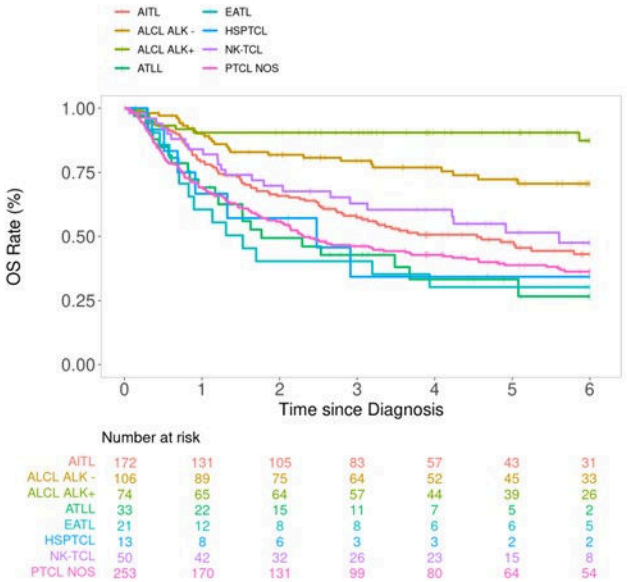

Figure 1