Incidence, clinical characteristics and risk factors of IEC-HS in patients treated with Talicabtagene Autoleucel (Humanized anti-CD19 CAR-T)

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Introduction

- Talicabtagene autoleucel (Tali-cel), a humanized anti-CD19 CAR-T cell, is approved for use in relapsed/refractory (r/r) B-cell malignancies in India.
- IEC-HS is a potentially life-threatening syndrome post-CAR-T (defined as per the ASTCT guidelines)

Objectives

- To calculate the incidence rate of IEC-HS in patients receiving Tali-cel therapy.
- To investigate the clinical characteristics and the factors associated with the development of IEC-HS.

Methods

- Retrospective study of patients receiving Tali-cel from January 2023 to November 2024.
- Patients with r/r B-cell lymphoma/leukemia who received Tali-cel therapy at Tata Memorial Hospital as part of standard care or a clinical trial.

Results

- Incidence of IEC-HS was **15.38%** with a median onset of **17 days** post-infusion (range, 4-48).
- Severity of IEC-HS at onset was **grade 1-2 in 72%** (13/18) cases and **grade 3-4 in 28%** (5/18) cases.
- Infections during the IEC-HS episode, **61%** (11/18), with positive cultures in **63.6%** (7/11) and pneumonia in **54.5%** (6/11).
- Treatment of IEC-HS: first-line anakinra **in 94%** (17/18) with a median **duration of 10 days** (range, 2-22), starting at 100 mg q8h and requiring dose escalation to a maximum of 200 mg q8h in 23.5% (4/17) patients.
- Outcomes in patients developing IEC-HS: **resolution in 61%** (11/18) of patients, 1 died of IEC-HS progression, 2 died from disease progression, 2 died from sepsis, 1 died from Stevens-Johnson syndrome, and 1 died from subdural hemorrhage.
- On univariate and multivariate analysis, pre-infusion **ferritin and disease bulk** were significantly associated with increased risk of IEC-HS development.

Conclusion

- IEC-HS is a serious but manageable complication of CAR-T cell therapy.
- Early recognition and targeted intervention are key to improving outcomes.

Characteristics and risk factors of IEC-HS			IEC-HS (Yes) (n=18)	IEC-HS (No) (n=99)
Demographics and disease characteristics				
Age, years (median, IQR)			32 (20.25 – 58.5)	37 (23.00 – 53.00)
Gender, n (%)	Female		4 (22.2%)	19 (19.2%)
	Male		14 (77.8%)	80 (80.8%)
Diagnosis, n (%)	B-cell acute lymphoblastic leukemia (B-ALL)	B-ALL (n)	11 (61.1%)	46 (46.5%)
		Not in remission (ALL – blasts)	5/11	11/46
		MRD positive	6/11	21/46
	B-cell lymphoma (BCL)	BCL (n)	7 (38.9%)	53 (53.5%)
		Extranodal involvement (lymphoma)	6/7	26/53
Bulky Disease, p-value 0.014			**9 (50%)**	**21 (21.2%)**
Hematological and inflammatory markers				
Ferritin, ng/ml (median, IQR), p-value < 0.001			**2250.46 (717.75 – 5273.25)**	**638 (314.00 – 1667.00)**
CRP, mg/dl (median, IQR)			1.23 (0.27 – 4.58)	0.39 (0.18 – 2.09)
Triglycerides, mg/dl (median, IQR)			129 (100.85 – 201.75)	115 (86.00 – 157.50)
Fibrinogen, mg/dl (median, IQR)			332 (230.50 – 453.75)	356 (311.00 – 422.00)
LDH, U/L (median, IQR)			242 (203.50 – 562.00)	243.5 (194.00 – 337.75)
Treatment-related factors				
CRS grade, n (%)	1-2		16 (89%)	68 (68.6%)
	3-4		1 (6%)	2 (2%)
G-CSF use, n (%)			11 (61.1%)	53 (53.5%)
Dose of CAR-T, dose/kg infused (median, IQR)			9 (5.75 – 11.39)	8 (6 -11)