



## The 65th ASH Annual Meeting Abstracts

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## 705.CELLULAR IMMUNOTHERAPIES: LATE PHASE AND COMMERCIALY AVAILABLE THERAPIES

**Early Predictors of Severe Cytopenia Post CAR-T for Identification of Patients for Potential Stem Cell Collection**

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**Background:** Cytopenias are a common complication of and prolonged (beyond month 3 post CAR-T infusion), severe (grade 3 or higher) cytopenias can be difficult to manage. Stem cell boosts have been reported to restore hematopoiesis; however, stem cells would need to be available prior to CAR-T therapy for potential use post CAR-T. Most lymphoma patients and limited number of myeloma patients may have pre-collected stem cells in storage. Identifying patients at high risk for prolonged and severe cytopenia post CAR-T at the time of CAR-T evaluation (baseline), before leukapheresis, can help identify the patients for coordination of stem cell collection during CAR-T manufacturing and increase the likelihood that the collected stem cells would be used. In this study, we aim to identify clinical variables at the time of CAR-T evaluation, prior to leukapheresis, that are associated with severe cytopenias at month 3 post CAR-T infusion and identify patients who could be considered for pre-emptive stem cell collection prior to CAR-T therapy.

**Methods:** We conducted a retrospective analysis of patients with multiple myeloma (MM) and non-Hodgkin lymphoma (NHL) who received CAR-T products at Mayo Clinic from 01/2016 to 06/2022. Patients with progressive disease in the first year post CAR-T were excluded from the analysis. Baseline (at CAR-T evaluation, prior to leukapheresis) variables were compared between those with and without severe cytopenia at month 3 post CAR-T. Severe cytopenias were defined as hemoglobin (Hg) < 8 g/dL, absolute neutrophil count (ANC) <  $0.5 \times 10^9/L$ , and/or platelet count (PLT) <  $50 \times 10^9/L$ . Statistically significant variables ( $p < 0.05$ ) by analysis were examined for statistical significance in multivariate analysis (MVA).

**Results:** Among the 166 patients who received CAR-T (88 NHL, 78 MM) during the study period, 31 (18.67%) had a severe cytopenia at month 3. Twenty baseline variables were examined; HGB, PLT, ANC, and c-reactive protein (CRP) We devised a cytopenia risk score using 1 point each for Hg < 10 or PLT < 100k at baseline, with a range of 0 to 2. Demographics and clinical outcome by cytopenia risk score is shown in Table 1B. A higher percentage of patients with a score of 1 or 2 had a severe cytopenia at month 3 (Figure 1). In particular, there was a . In addition

**Conclusion:** Baseline cytopenias before leukapheresis may identify patients with increased risk for severe cytopenias at month 3 post CAR-T. These patients can have continued slow hematopoietic recovery in the first year. Stem cell collection, if feasible, could be considered before CAR-T to alleviate post-CAR-T severe prolonged cytopenias.

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Table 1. Baseline cytopenia risk score

(A) Baseline variables associated with month 3 severe cytopenia

Variable	OR (95% CI) (univariate)	P value (univariate)	OR (95% CI) (multivariate)	P value (multivariate)
Hg	0.75 (0.57, 0.99)	.0055	0.74 (0.6, 0.91)	0.0052
Plt	0.99 (0.98, 0.99)	<.001	0.99 (0.98, 0.99)	0.0003

(B) Demographics and clinical outcome based on baseline cytopenia risk score

EVAL SCORE	0 (N=119)	1 (N=33)	2 (N=18)	Total (N=166)
Age, Median (Range)	62 (29-81)	61 (29-77)	62 (26-76)	62 (26-81)
Gender, Male, n (%)	70 (58.8%)	19 (61.3%)	6 (37.5%)	95 (57.2%)
Diagnosis, n (%)				
- Aggressive NHL	56 (47.1%)	15 (48.4%)	9 (56.2%)	80 (48.2%)
- Indolent NHL	8 (6.7%)	0 (0.0%)	0 (0.0%)	8 (4.8%)
- MM	55 (46.2%)	18 (51.6%)	7 (43.8%)	78 (47.0%)
Hg g/dL at baseline, Median (Range)	12.3 (10.0-16.2)	9.5 (7.4-13.4)	8.5 (6.9-9.6)	11.7 (8.0-16.2)
Plt x10 <sup>9</sup> /L at baseline, Median (Range)	190 (102-644)	144 (42-723)	63 (14-34)	173 (14-723)
ANC x10 <sup>9</sup> /L at baseline, Median (Range)	2.83 (0.32-13.13)	2.68 (0.02-10.73)	2.30 (0.21-7.56)	2.82 (0.02-13.13)
CRP mg/L at baseline, Median (Range)	4.3 (2.9-158.1)	6.9 (2.9-188.3)	17.1 (2.9-566.0)	5.3 (2.9-566.0)
Ferritin mcg/L at baseline, Median (Range)	124 (8-1852)	211 (23-1470)	652 (57-2732)	174 (8-2732)
LDH U/L at baseline, Median (Range)	201 (69-588)	220 (69-521)	221 (132-823)	207 (69-823)
ICANS				
Any grade, n (%)	71 (59.7%)	17 (54.8%)	13 (81.2%)	101 (60.8%)
>>G3, n (%)	12 (10.1%)	5 (16.1%)	1 (6.2%)	18 (10.8%)
CRS				
Any grade, n (%)	95 (79.8%)	28 (90.3%)	14 (87.5%)	137 (82.5%)
>>Gr 3, n (%)	2 (1.7%)	1 (3.2%)	0 (0%)	3 (1.8%)
Tocilizumab use, n (%)	35 (46.2%)	16 (51.6%)	5 (31.2%)	76 (45.8%)
Steroid use, n (%)	62 (52.1%)	19 (61.3%)	5 (31.2%)	86 (51.8%)

Figure 1: Cytopenia pattern post CAR-T based on baseline cytopenia risk score

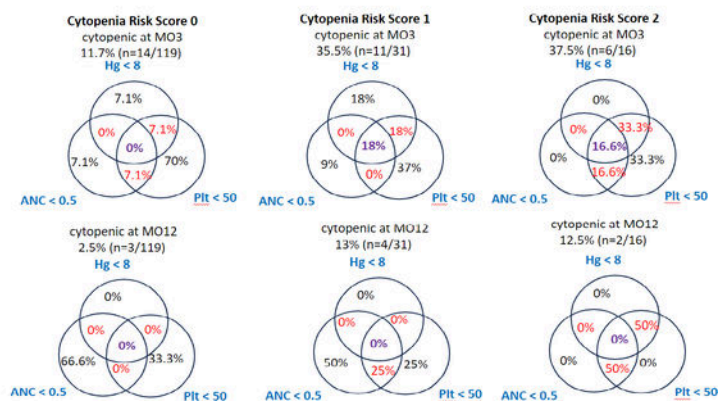


Figure 1

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