XIX CONGRESSO NAZIONALE SIES2026
Firenze | 4-6 marzo 2026 Palazzo degli Affari

XIX Congress of the Italian Society of Experimental Hematology ABSTRACT N. CO42

Stem Cell Transplantation, immunotherapy and cell therapy

DYNAMIC CHANGES AFTER ALLOGENEIC STEM CELL TRANSPLANTATION OF EXTRACELLULAR VESICLES ORIGINATED FROM PLATELETS, ENDOTHELIAL CELLS AND LEUKOCYTES AFTER: CORRELATION WITH ACUTE GVHD

G. Lia[1|2], A. Melis[1|2], F. Ferrando[1|2], M. Dicataldo[1|2], A. Martin[1|2], A. Evangelista[4], I. Dogliotti[1], C.M. Dellacasa[3], A. Busca[3], B. Bruno[1|2], L. Giaccone[1|2]

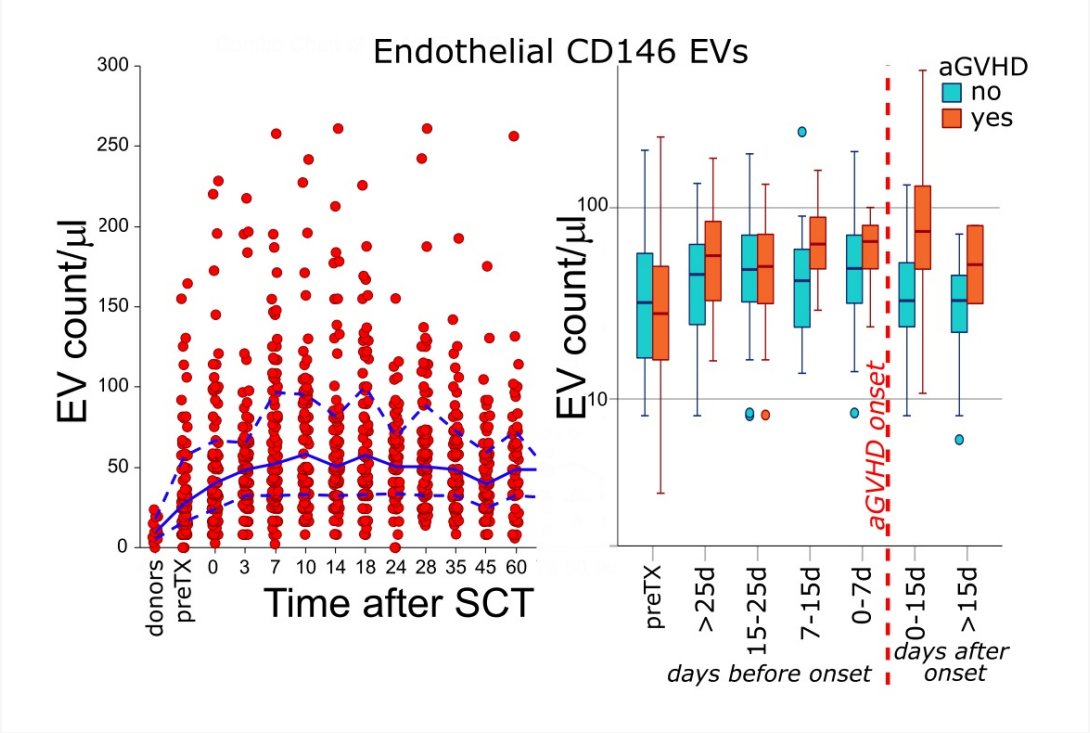
[1]Stem Cell Transplant Program, Department of Oncology, A. O. U. Città della Salute e della Scienza di Torino; [2]Department of Molecular Biotechnology and Health Sciences, University of Torino; [3]University Hospital A. O. U. "Città della Salute e della Scienza di Torino", Division of Hematology; [4]Clinical Epidemiology, A. O. U. Città della Salute e della Scienza di Torino.

Introduction: Acute Graft-versus-Host Disease (aGVHD) remains a major cause of morbidity and mortality following allogeneic stem cell transplantation (SCT). No validated biomarkers are currently available to improve its prevention and treatment. We previously identified a potential link between aGVHD risk and CD146 expression (a cell adhesion molecule expressed by activated/dysfunctional endothelial cells) on extracellular vesicles (EV). Although CD146 is broadly recognized as a pan-endothelial marker, it is also found in some lymphocyte subsets and macrophages. In this study, we applied a patented polychromatic flow cytometry (PFC) protocol to analyze kinetic changes in circulating EV after SCT and assess the origin and predictive value of CD146 EV in aGVHD.

Methods: Eighty SCT recipients were enrolled; 19 developed aGVHD (grade II: n=10; grade III-IV: n=9). Blood samples were collected at multiple time points: before SCT, and at 0, 3, 7, 10, 14, 18, 24, 28, 35, 45, 60, 70, 80, 90 and 180 days post-SCT. A few microliters of fresh, unprocessed blood were incubated in BD Trucount™ Tubes for absolute PFC-based EV counts using the following markers: phalloidin-FITC, APC-conjugated lipophilic cationic dye, anti-CD31-PE-Cy7, anti-CD45-V500, anti-CD41a-PE, and anti-CD146-B-V786. EV phenotypes were analyzed via BD FACSLyric™, identifying EV from leukocytes (CD45+ or LK), platelets (CD41a+/CD31+/CD45−), and endothelium (CD41a−/CD31+/CD45− or EC), including CD146+ LK and EC activated subsets. Associations between EV absolute counts and aGVHD risk were evaluated using logistic regression models (LRM), estimating odds ratios (OR) as absolute values and as proportional changes from baseline. Analyses were performed with STATA 15 and SPSS 25.

Results: Platelet-derived EV concentrations mirrored platelet counts over time (rho = 0.75; p<0.001). Total LK and CD146 LK EV did not significantly increase post-SCT, though CD146 LK EV levels remained higher in patients vs. healthy donors. These levels were not associated with aGVHD onset. Conversely, both total EC EV and CD146+ EC EV increased during the first two weeks post-SCT. CD146 EC EV were associated with aGVHD onset ([Figure] absolute level OR 1.11 p=0.038; EV count change OR 1.094 p=0.043). Notably, the ratio of CD146 EC EV to total EC EV rose significantly before aGVHD onset, suggesting endothelial activation. This increase was linked to elevated CD146 EC EV, with significant associations for both absolute ratio (OR 1.248; p=0.043) and ratio change (OR 1.183; p=0.033).

Conclusions: This study identified early post-SCT increases in endothelial EV, indicating endothelial dysfunction. CD146 EC EV, in particular, were associated with aGVHD onset and may serve as early biomarkers. A prospective study is underway to confirm these findings and further characterize EV immunophenotypes using another standardized PFC assay (MACSPlex EV Kit).


Endothelial CD146 EVs
EV count/µl
300
250
200
150
100
50
0
donors
preTX
0
3
7
10
14
18
24
28
35
45
60
Time after SCT
aGVHD
no
yes
100
10
aGVHD onset
preTX
>25d
15-25d
7-15d
0-7d
0-15d
>15d
days before onset
days after onset