Keywords: Absolute lymphocyte count; Absolute monocytes count; Survival; Autologous peripheral hematopoietic stem cell transplantation; Diffuse large B-cell lymphoma

Introduction

Day 15 absolute lymphocyte count (ALC-15) ≥ 500 cells/µl has been reported to be a prognostic factor for survival post-autologous peripheral hematopoietic stem cell transplantation (APHSCT) [1-8]. However, some patients relapsed post-APHSCT despite achieving an ALC-15 ≥ 500 cell/µl, while other patients with an ALC-15 < 500 cells/µl remained in complete remission post-APHSCT. However, recent gene-expression profiling studies in non-Hodgkin lymphoma (NHL) have demonstrated that gene expression by tumor-infiltrating myeloid-derived cells predicts clinical outcomes [9-10]. Furthermore, monocyte-derived cells may also provide trophic factors which directly promote the growth and survival of malignant lymphocytes [11-12].

Monocytes and their progeny, as myeloid-derived cells, promote lymphomagenesis by suppression of host immunity, stimulation of tumor angiogenesis, and provision of trophic factors; thus, we studied the impact of absolute lymphocyte count/absolute monocyte count ratio at day 15 (ALC/AMC-15 ratio), as a simple biomarker combining host immunity (i.e., ALC-15) and tumor microenvironment [i.e., absolute monocyte count at day 15 (AMC-15)], on clinical outcomes post-APHSCT in patients with diffuse large B-cell lymphoma (DLBCL).

Materials and Methods

Patient population

To participate in the study, patients were required to be candidates for APHSCT with the diagnosis of DLBCL, have chemosensitive disease prior to APHSCT, and have mobilized enough peripheral blood stem cells to proceed with APHSCT (minimum of 2.0 x 10^6 CD34 cells/kg). Patients were excluded if they failed to mobilize stem cells, required bone marrow harvest, were infused with both peripheral blood and bone marrow harvest-derived stem cells, or participated in stem cell transplantation clinical trials. Patients stem cells mobilized by the combination of granulocyte-colony stimulating factor (G-CSF) and chemotherapy (i.e., cyclophosphamide or etoposide) or the combination of G-CSF and Plerixafor were also excluded. No patients were lost to follow-up. From 1994 to 2007, 256 DLBCL patients qualified for the study. All patients gave written, informed consent allowing the use of their medical records for medical research. Approval for the retrospective review of these records was obtained from the Mayo Clinic Institutional Review Board and was in accordance with US federal regulations and the Declaration of Helsinki.

End points

The primary end point of the study was to assess the impact of ALC/AMC-15 ratio on overall survival (OS) and progression-free survival (PFS) from the time of APHSCT. The second end point was to identify the source of AMC-15 recovery post-APHSCT. The ALC-15, AMC-15, and ALC/AMC-15 were calculated from the complete blood cell count (CBC) [13] obtained at day 15 post-APHSCT. ALC/AMC-15 ratio was calculated by dividing ALC-15 over AMC-15. The infused autograft-absolute lymphocyte count (A-ALC) for each apheresed unit collection was calculated as follows: A-ALC = (% collection lymphocytes) x absolute white blood cell count [WBC]/kg. The infused autograft-absolute monocyte count (A-AMC) for each apheresed unit was calculated as follows: A-AMC = (% collection monocytes) x absolute WBC)/kg.
Prognostic factors

The following prognostic factors were evaluated in the study:

- International Prognostic Index (IPI) [14] at diagnosis: [age ≥ 60 years, lactate dehydrogenase (LDH > normal), performance status (PS ≥ 2 vs < 2), extranodal sites (≥ 2 vs < 2), stage (III/IV vs I/II), IPI at [15] at relapse (IPI-R) [age-R (≥ 60 vs ≤ 60 years), extranodal sites-R (≥ 2 vs < 2), LDH-R (abnormal), performance status-R (≥ 2 vs < 2), and stage-R (I/II vs III/IV)], disease status prior to APHSCT [complete remission (CR) vs partial response (PR)], ALC-15, AMC-15, ALC/AMC-15 ratio, absolute neutrophil count at day 15 (ANC-15) post-APHSCT, absolute platelet count at day 15 (plts-15) post-APHSCT, and pre-transplant rituximab (+R) vs no rituximab (-R)

Peripheral blood stem cell (autograft) collections

The three different types of instruments used at our facility during the period examined in this study were the COBE Spectra (Gambro BCT, Lakewood, CO, USA), Baxter Amicus (Baxter Healthcare, Deerfield, IL, USA) and Fenwal CS3000 (Baxter, Healthcare, Deerfield, IL, USA). All patients were collected using a single instrument type based on availability of the instrument on the day of collection. Patients received G-CSF for mobilization at a dose of 10µg/kg daily for 5-7 consecutive days by subcutaneous injection. None of the patients received chemotherapy or other mobilizing agents. Once the peripheral blood CD34+ cell count was ≥ 10 cells/µl, patients began daily apheresis until a minimum target of 2.0 x 10^6 CD34+ cells/kg was reached.

Conditioning regimens

Conditioning regimens were as follows: two-hundred and three patients received BEAM [BCNU (300 mg/m²) on day -6, Etoposide]...
(100mg/m²) twice daily from days -5 to -2, ARA-C (100mg/m²) twice daily from days -5 to -2, and Melphalan (140mg/m²) on day -1], forty-seven patients received BEAC [BCNU (300 mg/m²) on day -6, Etoposide (100mg/m²) twice daily from days -5 to -2, ARA-C (100mg/ m²) twice daily from days -5 to -2, and Cyclophosphamide (35mg/kg) on day -1], and six patients received Cyclophosphamide (60 mg/m² x 2) and total body irradiation (TBI) (12 Gy).

Response and survival
Response criteria were based on the guidelines from the International Harmonization Project on Lymphoma [16]. OS was measured from the date of transplant to the date of death, or last follow-up. PFS was defined as the time from transplant to the time of progression, relapse, death, or last follow-up.

Statistical analysis
OS and PFS were analyzed using the approach of Kaplan and Meier [17]. Differences between survival curves were tested for statistical significance using the 2-tailed log-rank test. The Cox proportional hazard model [18] was used for the univariate and multivariate analysis to evaluate the variables under the prognostic factors section to assess their impact on post-APSCHT OS and PFS times. The choice of optimal cut-off of ALC-15, AMC-15, and ALC/AMC-15 ratio to assess survival was based on their utility as a marker for the clinically relevant binary outcome of death/survival using the receiver operating characteristics curves (ROC) and area under the curve. The binary clinical outcome (death/survival) was established at 5 years post-APHSCT. Patients were classified as “alive/censored” when follow-up time was greater than 5 years and “death” for patients known to have died before this time point [19]. Relapse mortality (RM) and non-relapse mortality (NRM) were estimated using the cumulative incidence method.

Prediction of AMC-15 recovery was explored using logistic regression models, univariately assessing continuous and dichotomized values of A-AMC as well as other potential prognostic factors. χ²-tests were used to determine relationships between categorical variables. The Wilcoxon-rank test was used to determine associations between continuous variables and categories, and Pearson’s correlation coefficients were used to evaluate associations for continuous variables. The Mahalanobis distance was used as an independent approach to assess the robustness of the Pearson correlation. All p values represented were two-sided and statistical significance was declared at p <0.05.

Results
Patient’s characteristics
The median age at the time of transplant for this cohort of 256

![Image](https://example.com/image.png)

Figure 1: Receiver operating characteristics curves (ROC) and area under the curve (AUC) to identify best cut-off points for absolute lymphocyte count at day 15 (ALC-15); absolute monocyte count at day 15 (AMC-15); and absolute lymphocyte count/absolute monocyte count ratio at day 15 (ALC/AMC-15) for the binary clinical outcome “death/survival” established at 5 years post-autologous peripheral hematopoietic stem cell transplantation (APHSCT). (a) ALC-15 ≥ 500 cells/µl had an AUC of 0.75 with a sensitivity of 76% and specificity of 69%.
(b) AMC-15 ≥ 600 cells/µl had an AUC of 0.70 with a sensitivity of 72% and specificity of 67%.
(c) ALC/AMC-15 ≥ 1 had an AUC of 0.85 with a sensitivity of 84% and a specificity of 79%.
DLBCL patients was 57 years (range: 17-77 years). The distribution of additional baseline characteristics for these patients is presented in Table 1. The median follow-up on living patients (N = 129) is 5.6 years (range: 0.2-16.7 years). The day 100 transplant related mortality (TRM) for the cohort of patients was 2% (5/256). One-hundred and five patients died due to relapse/progression of lymphoma. Seventeen patients died of unrelated lymphoma causes, excluding the five patients that died in the first 100 days post-APHSCT.

Cut-off values for ALC-15, AMC-15, and ALC-15/AMC-15 ratio for survival analysis

ROC curves and AUC were used to determine the optimal cut-off points for ALC-15, AMC-15, and ALC/AMC-15 ratio based on their utility as a marker for the clinical binary outcome of death/survival (Figure 1). ALC-15 ≥ 500 cells/µl had an AUC of 0.75 with a sensitivity of 76% and specificity of 69%. AMC-15 ≥ 600 cells/µl had an AUC of 0.70 with a sensitivity of 72% and specificity of 67%. ALC/AMC-15 ratio ≥ 1 had an AUC of 0.85 with a sensitivity of 84% and a specificity of 79%.

In multivariate logistic regression analysis, ALC/AMC-15 ratio showed a strong discriminatory utility as a marker for the clinical binary outcome of death/survival ($\chi^2 = 25.6, p < 0.0001$) compared with ALC-15 ($\chi^2 = 14.0, p < 0.0002$), and AMC-15 ($\chi^2 = 8.1, p < 0.005$). In order to evaluate the relevance of ALC/AMC-15 ratio post-APHSCT, patients were divided into two groups: ALC/AMC-15 ≥ 1 versus ALC/AMC-15 < 1.

### Table 2: Patients’ characteristics based on the ALC-15/AMC-15 ratio ≥ 1 versus < 1

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>ALC-15/AMC-15 ≥ 1 (N = 120)</th>
<th>ALC-15/AMC-15 &lt; 1 (N = 136)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>At Diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, years, median (range)</td>
<td>55 (22-76)</td>
<td>55 (17-76)</td>
<td>0.2</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>Male</td>
<td>71 (59.0%)</td>
<td>49 (36.0%)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>49 (41.0%)</td>
<td>49 (36.0%)</td>
<td></td>
</tr>
<tr>
<td>Extra-nodal sites</td>
<td>81 (66.2%)</td>
<td>87 (64.0%)</td>
<td>0.6</td>
</tr>
<tr>
<td>LDH (U/L), median (range)</td>
<td>211 (110-2400)</td>
<td>284 (111-2250)</td>
<td>0.3</td>
</tr>
<tr>
<td>PS</td>
<td></td>
<td></td>
<td>0.1</td>
</tr>
<tr>
<td>0</td>
<td>33 (27.5%)</td>
<td>33 (24.3%)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>85 (70.8%)</td>
<td>107 (78.6%)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2 (1.7%)</td>
<td>6 (4.4%)</td>
<td></td>
</tr>
<tr>
<td>Stage</td>
<td></td>
<td></td>
<td>0.9</td>
</tr>
<tr>
<td>I</td>
<td>13 (10.8%)</td>
<td>19 (14.0%)</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>21 (17.5%)</td>
<td>22 (16.2%)</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>26 (21.7%)</td>
<td>31 (22.8%)</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>60 (50.0%)</td>
<td>64 (47.0%)</td>
<td></td>
</tr>
<tr>
<td>IPI risk factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, years, median (range)</td>
<td>53 (31.7%)</td>
<td>56 (41.7%)</td>
<td>0.1</td>
</tr>
<tr>
<td>&gt;60</td>
<td>38 (68.3%)</td>
<td>80 (58.8%)</td>
<td></td>
</tr>
<tr>
<td>≤ 60</td>
<td>82 (56.2%)</td>
<td>56 (41.7%)</td>
<td></td>
</tr>
<tr>
<td>Extra-nodal sites</td>
<td>8 (6.7%)</td>
<td>13 (9.6%)</td>
<td>0.5</td>
</tr>
<tr>
<td>&gt; 1</td>
<td>112 (93.3%)</td>
<td>123 (90.4%)</td>
<td>&lt;0.04</td>
</tr>
<tr>
<td>≤ 1</td>
<td>21 (17.5%)</td>
<td>31 (22.8%)</td>
<td></td>
</tr>
<tr>
<td>LDH</td>
<td></td>
<td></td>
<td>&lt;0.04</td>
</tr>
<tr>
<td>abnormal</td>
<td>51 (42.5%)</td>
<td>75 (55.2%)</td>
<td></td>
</tr>
<tr>
<td>normal</td>
<td>64 (57.5%)</td>
<td>61 (44.8%)</td>
<td></td>
</tr>
<tr>
<td>PS</td>
<td></td>
<td></td>
<td>0.3</td>
</tr>
<tr>
<td>&gt; 1</td>
<td>2 (1.7%)</td>
<td>6 (4.4%)</td>
<td></td>
</tr>
<tr>
<td>≤ 1</td>
<td>116 (88.3%)</td>
<td>130 (95.6%)</td>
<td></td>
</tr>
<tr>
<td>Stage</td>
<td></td>
<td></td>
<td>0.8</td>
</tr>
<tr>
<td>I</td>
<td>34 (28.0%)</td>
<td>41 (30.0%)</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>86 (72%)</td>
<td>95 (70.0%)</td>
<td></td>
</tr>
<tr>
<td>IPI score</td>
<td></td>
<td></td>
<td>0.1</td>
</tr>
<tr>
<td>0</td>
<td>17 (14.0%)</td>
<td>15 (11.0%)</td>
<td></td>
</tr>
</tbody>
</table>

**Abbreviations:** Age-R = age at relapse; Extra nodal sites-R = extranodal sites at relapse; LDH = lactate dehydrogenase; LDH-R = lactate dehydrogenase at relapse; PS = performance status; PS-R = performance status at relapse; Stage-R = stage at relapse; IPI = International Prognostic Index; IPI-R = International Prognostic Index at relapse; CTX= cyclophosphamide; TBI = Total body irradiation; BEAC = BCNU, etoposide, Ara-C, and cyclophosphamide; BEAM = BCNU, etoposide, Ara-C, and melphalan; CR = complete remission; PR = partial response.

AMC-15 < 1 (Table 2). The only differences between the groups were the dichotomized LDH at diagnosis, IPI values at diagnosis, extranodal sites at relapse (ES-R), LDH at relapse (LDH-R), performance status at relapse (PS-R), stage at relapse (stage-R), IPI values at relapse (IPI-R), and the outcome prior to transplant. No difference between the groups was observed in regard to number of prior treatments before transplant and the use or not of pre-transplant rituximab. The day 100 TRM for the ALC/AMC-15 ratio ≥ 1 group was 0.8% (1/120) and 3% (4/136) for the ALC/AMC-15 ratio < 1 group (p = 0.4). The unrelated lymphoma mortality for the ALC/AMC-15 ratio ≥ 1 group was 6% (7/120) and 7% (10/136) for the ALC/AMC-15 ratio < 1 group (p = 0.8).

Overall survival and progression-free survival

Figure 2a shows the OS and PFS post-APHSCT for the cohort of 256 DLBCL patients. The 5-year OS rate and PFS rate were 50% and 45%, respectively. Figure 2b shows the OS post-APHSCT based on patients treated +R versus –R prior to APHSCT. The 1-year and 3-year OS rates for +R and –R cohorts were 78% versus 55% and 66% versus 42%, respectively. Figure 2c shows the PFS post-APHSCT based on patients treated +R versus –R prior to APHSCT. The 1-year and 3-year PFS rates for +R and –R cohorts were 66% versus 45% and 57% versus 38%, respectively. Due to the long-term follow-up in this study, we also studied the cumulative mortality of RM and NRM to compare with other long-term follow-up studies of DLBCL post-APHSCT [20].

Figure 2 D shows that ten year estimated incidence of RM and NRM was 30% and 15%, respectively. Figure 3 shows the OS and PFS for AMC-15, AMC-15, and ALC/AMC-15 ratio. The median OS (Figure 3a) and PFS (Figure 3b) times for AMC-15 ≥ 500 cells/µl vs < 500 cells/µl were not reached at 1.4 months, 5-year OS rates of 72% vs 28%, p < 0.0001; and 197.0 months vs 5.8 months, 5-years PFS rates of 66% vs 24%, p < 0.0001, respectively.

The median OS (Figure 3c) and PFS (Figure 3d) times for AMC-15 ≥ 600 cells/µl vs < 600 cells/µl were 15.3 months vs not reached, 5-year OS rates of 27% vs 74%, p = 0.0001; and 6.0 months vs 142.0 months, 5-years PFS rates of 24% vs 68%, p < 0.0001, respectively. The median OS (Figure 3e) and PFS (Figure 3f) times for AMC/AMC-15 ratio ≥ 1 vs < 1 were not reached vs 9.9 months, 5-year OS rates of 86% vs 16%, p < 0.0001; and 197.0 months vs 4.4 months, 5-years PFS rates of 83% vs 10%, p < 0.0001, respectively.

Univariate and multivariate analysis

In the univariate analysis, the following variables were predictors for OS: age, IPI, LDH, CR prior to transplant, ALC-15, AMC-15, ALC/AMC-15 ratio, ANC-15, pla-t15, ES-R, LDH-R, PS-R, stage-R, IPI-R, and pre-transplant +R versus -R (Table 3). For PFS, the univariate analysis showed the following variable as predictors: CR prior to transplant, IPI, LDH, ALC-15, AMC-15, ALC/AMC-15 ratio, ANC-15, pla-t15, ES-R, LDH-R, PS-R, stage-R, IPI-R, and pre-transplant...
+R versus -R (Table 3). The multivariate analysis showed that ALC/AMC-15 ratio remained an independent predictor for OS and PFS when compared with the other prognostic factors analyzed in the study (Table 4).

Survival based on ALC-15/AMC-15 categories and ALC-15/AMC-15 ratio

Patients were divided into four groups based on their ALC-15 and AMC-15. Group 1 was patients with an ALC-15 ≥ 500 cells/µl and AMC-15 < 600 cells/µl; group 2 was patients with an ALC-15 < 500 cells/µl and AMC-15 < 600 cells/µl; group 3 were patients with an ALC-15 ≥ 500 cells/µl and AMC-15 ≥ 600 cells/µl; and group 4 were patients with an ALC-15 ≥ 500 cells/µl and AMC-15 < 600 cells/µl. Figure 4a shows the OS and Figure 4b shows the PFS based on the four group categories. Group 1 showed the best OS and PFS. Group 4 showed the worst OS and PFS. All patients in group 1 (ALC-15 ≥ 500 cells/µl and AMC-15 < 600 cells/µl) had an ALC-AMC-15 ratio ≥ 1, compared with all patients in group 4 (ALC-15 < 500 cells/µl and AMC-15 ≥ 600 cells/µl) with an ALC-AMC-15 < 1. However, we did not see any difference in OS and PFS between groups 2 and 3. Therefore, we studied if ALC-AMC-15 ratio can further discriminate survival in these two groups as patients in group 2 and 3 could have either an ALC-AMC-15 ratio ≥ 1 or an ALC-AMC-15 < 1. Figures 5a and 5b show that patients in group 2 with an ALC-AMC-15 ratio ≥ 1 had superior OS and PFS compared with patients in group 2 with an ALC-AMC-15 ratio < 1. Similarly, Figures 5c and 5d show that patients in group 3 with an ALC-AMC-15 ≥ 1 had a superior OS and PFS compared with patients in group 3 with an ALC-AMC-15 < 1.

Source of AMC-15 recovery post-APHSCT

We previously published that ALC-15 recovery post-APHSCT depended on the infused A-ALC from the autograft. In this study, we again showed a positive correlation between A-ALC and ALC-15 (r = 0.7, p < 0.0001). Thus, we set out to investigate if the monocytes collected in the autograft (A-AMC) directly affect AMC-15 recovery post-APHSCT. We identified a positive correlation between the infused A-AMC and AMC-15 before (r = 0.7, p < 0.0001) and after (r = 0.7, p < 0.0001) outliers identified by the Mahalanobis distance were eliminated (Figure 6). We also identified a positive correlation between infused CD34 and AMC-15 (r = 0.2, p < 0.02). In multivariate logistic regression analysis, A-AMC had a stronger contribution to AMC-15 recovery compared with infused CD34: CD34 (χ² = 4.2, p < 0.04) and A-AMC (χ² = 106.7, p < 0.0001).

We identified no correlation between A-AMC and ALC-15 (r = 0.07, p = 0.3). However, we found a positive correlation between the infused A-ALC/A-AMC ratio and ALC-AMC-15 ratio (r = 0.6, p < 0.0001).
Clinical outcomes post-APHSCT in DLBCL patients with an ALC-15 count ≥ 500 cells/µl. In contrast, patients with a higher AMC-15 recovery (≥ 600 cell/µl) experienced poor survival. Combining both biomarkers, ALC-15 ≥ 500 cells/µl and AMC-15 ≥ 600 cell/µl, as representative biomarkers of host immunity and the tumor microenvironment, to study clinical outcomes post-APHSCT in patients with DLBCL.

As in our previous publications, this study continues to show better clinical outcomes post-APH SCT in DLBCL patients with an ALC-15 ≥ 500 cells/µl. In contrast, patients with a higher AMC-15 recovery (≥ 600 cells/µl) experienced poor survival. Combining both biomarkers, ALC-15 ≥ 500 cells/µl and AMC-15 ≥ 600 cell/µl, as representative biomarkers of host immunity and the tumor microenvironment, to study clinical outcomes post-APHSCT in patients with DLBCL.
patients with an ALC/AMC-15 ratio ≥ 1 showed superior survival versus those with ALC/AMC-15 < 1. In multivariate logistic regression analysis, ALC-15/AMC-15 ratio showed a strong discriminatory utility as a marker for the clinical binary outcome of death/survival compared with ALC-15 and AMC-15. ALC/AMC-15 ratio was also an independent predictor for survival post-APHSCT in the multivariate analysis.

To further assess the survival discriminatory power of ALC/AMC-

15 ratio, patients were divided into four categorical groups based on low or high values from the cut-off values for ALC-15 (500 cells/µl) and AMC-15 (600 cells/µl): group 1 included patients with high ALC-15 and low AMC-15; group 2 was low values from both ALC-15 and AMC-15; group 3 was high values for both ALC-15 and AMC-15; and group 4 was low ALC-15 and high AMC-15. All patients in group 1 had an ALC/AMC-15 ≥ 1 and all patients in group 4 had an ALC/AMC-15 < 1. However, groups 2 and 3 could have patients with either an ALC/AMC-15 ratio ≥ 1 or < 1. These two groups had similar OS and PFS post-APHSCT. Patients in groups 2 and 3 with an ALC/AMC-15 ratio ≥ 1 had better OS and PFS compared with patients in the same groups with an ALC/AMC-15 ratio <1.

The association between AMC-15 and survival post-APHSCT led us to investigate the source of AMC-15 recovery post-APHSCT. We previously published that ALC-15 recovery depends on the infused A-ALC. None of the patients in this study had any manipulation of their collected and infused autograft. We identified a strong positive correlation between A-AMC and AMC-15. Arrows indicate those patients that according to the Mahalanobis distances are outliers. R1 and R2 correspond to the Pearson's r values before and after eliminating possible outliers. The regression line was estimated after the elimination of outliers.

The strengths of the study include long term follow-up of a uniform group of patients with DLBCL treated consecutively at a single institution. The median follow-up for the whole cohort was 2.8 years and 5.6 years for the living patients. This study expands on the previous publications regarding ALC-15 and highlights the importance of the interaction between host immunity and tumor microenvironment, using the simple biomarkers of ALC-15 and AMC-15 combined in the prognostic factor of ALC/AMC-15 ratio. Finally, the association between AMC-15 recovery post-APHSCT and infused A-AMC provides a rationale to develop therapeutic interventions to minimize collection of monocytes in the autograft or to deplete CD14+ monocytes in the autograft.

In conclusion, if reproducible, the ALC/AMC-15 ratio has the potential to be an early obtainable and universally applied biomarker to identify patients at higher risk of relapse for consideration of maintenance therapeutic interventions post-APHSCT.

References


Figure 6: Scatter plot comparing absolute monocyte count at day 15 (AMC-15) post-autologous peripheral hematopoietic stem cell transplantation (APHSCT) and infused autograft absolute monocyte count (A-AMC). A positive correlation was identified between A-AMC and AMC-15. Arrows indicate those patients that according to the Mahalanobis distances are outliers. R1 and R2 correspond to the Pearson's r values before and after eliminating possible outliers. The regression line was estimated after the elimination of outliers.


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