

Post Autologous Stem Cell Transplantation Complication Management in Case of Malignant Lymphoma Patients

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ABSTRACT

Introduction: Autologous hematopoietic stem cell transplantation (ASCT) represents a standard therapy in the management of hematologic malignancies such as malignant lymphomas and has been used for approximately three decades. The aim of this study was to determine the occurring post-ASCT complications and their impact on the patients' recovery for a better management. **Material and methods:** An observational retrospective study was performed during a five-year period between 2012 and 2017, involving 58 classical Hodgkin lymphoma and 36 non-Hodgkin lymphoma patients, who underwent ASCT in the Bone Marrow Transplantation Unit of Tîrgu Mureş. The main analyzed complications were: infections, bleeding, hydroelectrolytic disorders, and hypoalbuminemia. **Results:** After data analysis we found that 17 patients (18%) presented microbiologically confirmed infection, 10 patients (11%) presented clinically non-significant bleeding, 39 patients (42%) presented electrolyte disorders, and 33 patients (36%) presented hypoalbuminemia, obtaining a positive correlation between the rate of adverse events after ASCT with age ($r = 0.9914$, $p = 0.0009$) and the average hospitalization period ($r = 1$, $p < 0.00001$). **Conclusions:** The identification of adverse events and their correlation with the patients' clinical outcome can lead to better patient management and a faster recovery after ASCT.

Keywords: malignant lymphoma, autologous stem cell transplantation, complication management

INTRODUCTION

Autologous hematopoietic stem cell transplantation (ASCT) represents a standard therapy in the management of hematologic malignancies such as malignant lymphomas and has been used for approximately three decades.^{1,2} The standard first-line chemotherapy used in Hodgkin lymphomas consists of 12 applications of the ABVD (doxorubicin, bleomycin, vinblastin, dacarbazine) regimen. In case of non-Hodgkin lymphomas, the first line of chemotherapy includes 8 courses of the CHOP regimen (cyclophosphamide, doxorubicin, vincristine, and pred-

nisone). In both subtypes of lymphomas, the first-line chemotherapy can be combined with targeted antibody therapy (e.g., rituximab + CHOP) and radiation treatment. Despite the new era of novel targeted drugs, ASCT still remains a significant treatment method for relapsed or chemoresistant Hodgkin and non-Hodgkin lymphomas.²⁻⁴ Due to the high-dose conditioning regimens, post-ASCT complications, such as viral and bacterial infections, can have a major impact on clinical outcome and the patients' recovery.^{5,6}

The present study aimed to determine the complications occurring after ASCT, as well as their impact on the patients' recovery for a better patient management.

MATERIAL AND METHODS

An observational retrospective study was performed during a five-year period between 2012 and 2017, involving 58 classical Hodgkin lymphoma patients and 36 subjects with non-Hodgkin lymphoma, who underwent ASCT in the Bone Marrow Transplantation Unit of Tîrgu Mureş. All the enrolled patients benefited from standard-dose CEAM conditioning regimen (CCNU, etoposide, ara-c, melphalan). The main analyzed complications were: infections, bleeding, electrolyte disorders, and hypoalbuminemia. For each enrolled subject, lingual, nasopharyngeal, and urinary culture was collected for microbiological analysis before and after ASCT. In order to determine the presence or absence of hydroelectrolytic disorders and hypoalbuminemia, daily serum biochemistry analysis was performed. The obtained data was recorded in the patients' personal files. In order to identify the statistical relation between the presence of complications and the patients' age, as well as the number of complications and the hospi-

talization period, the Pearson Correlation Coefficient Calculator was used. The statistical significance was set at an alpha value of 0.05.

RESULTS

After processing all data regarding our study group, we found that most patients presented electrolyte disorders, followed by hypoalbuminemia, microbiologically confirmed infections, and clinically non-significant bleedings (Figure 1).

According to the number of complications present in each patient, the study lot was divided in five groups: patients without complications, and subjects with one, two, three, or four simultaneous complications. Regarding to the above-mentioned groups, the following distribution was found: 23 patients did not present any complication (24.4%), 28 patients with one adverse event post-ASCT (29.7%), 20 patients with two complications (21.3%), 14 out of 94 patients (14.9%) presented 3 complications, while 9 patients (9.6%) from the study lot presented all four of the examined adverse events (Figure 1). The correlation coefficient between the number of complications and the median age for each group was $r = 0.9914$ ($p = 0.0009$), showing that age was directly proportional to the number of complications, and the results also showed a positive correlation between the complication rate and the average days of hospitalization after ASCT ($r = 1$, $p < 0.00001$) (Table 1).

DISCUSSIONS

The results of the present study found that the most frequent complication occurring after autologous hematopoietic stem cell therapy in lymphoma patients was the presence of electrolyte disturbances, followed by low serum albumin levels and bacteriologically confirmed infections. The rarest complication found in our study cohort was the presence of non-significant bleedings. In case of bacteriological evidence of infection, targeted antibiotic therapy was initiated. In case of bleeding, supportive plate-

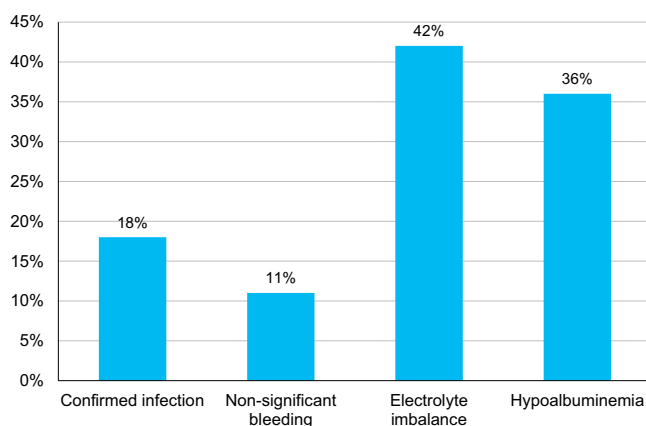


FIGURE 1. The rate of post-ASCT complications in the study population

TABLE 1. The median age and post-ASCT hospitalization period of each study group according to the number of complications

Number of complications	None	1	2	3	4
Median age (years)	31.6	34.1	37	41.2	45.8
Hospitalization period (average number of days)	14.4	15.2	16.1	16.9	17.7

let and fresh frozen plasma transfusion was administered, over and above in persisting active bleeding recombinant human coagulation factor VIIa (NovoSeven®) was dosed. Substitutive therapy was initiated in case of hydroelectrolytic disorders or hypoalbuminemia.

A study conducted by Jones *et al.* in the Anderson Cancer Center in Texas, focusing on post-ASCT complications during hospitalization and their impact on hospitalization costs, had highlighted the importance of this question. The results found a strong correlation between the presence of adverse events and increased costs.⁷ A recently published research by Otrrock *et al.* examined adverse events related to cryopreserved stem cell infusion and demonstrated that most of these immediate adverse events can be attributed to dimethyl-sulfoxide (DMSO), but the study did not evaluate the correlation between the DMSO-induced adverse events and the patients' age or hospitalization period.⁸

CONCLUSIONS

Based on the clinical and statistical analysis, we can conclude that the presence of complications and the number of these complications show a statistically significant positive correlation with the hospitalization period after autologous stem cell transplantation. Moreover, older patients were more likely to present multiple adverse events after transplantation. The identification of risk groups among transplanted patients and a better prediction of potential

complications can lead to a more efficient patient management, conducting to an improved post-ASCT clinical outcome and a cost-efficient hospitalization.

CONFLICT OF INTEREST

Nothing to declare.

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