



Return to Work of Lymphoma Survivors after Autologous Stem Cell Transplantation: A Single-center Cross-sectional Study

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Abstract

Background: Effectiveness of autologous stem cell transplantation (ASCT) in patients with relapsed/refractory lymphoma is accepted by all authors. After ASCT, the 5-year overall survival rates can reach up to 80%. However, returning to work after ASCT and the employment status of these patients are unknown.

Objectives: This study aimed to examine the rate of not returning to work in the post-treatment period and the factors that may affect the employment status of patients who underwent ASCT with the diagnosis of relapsed/refractory lymphoma.

Methods: This cross-sectional study was conducted from January to June 2020. It was performed on patients within the age ranges of 18-65 who had undergone ASCT with the diagnosis of relapsed or refractory lymphoma and were in remission without recurrence one year after ASCT.

Results: In total, 80 (74.8%) out of 107 patients included in the study were male, and the median age was 49.0 (21-63). Majority of participants were primary school graduates (n=66, 61.7%) and married (n=90, 84.1%). Before ASCT, 30 (28.0%) patients worked in the private sector and 17 (15.9%) of them were self-employed. The median follow-up time was 34.8 months (12.4 - 124.7 months). During this follow-up period, 35 (57.3%) out of 61 patients did not return to work. Most of these patients had retired (n=29, 47.5%). It was observed that having a higher education level (OR: 0.32 [0.14-1.22] 95% CI, p:0.041) and being a public employee (OR: 0.30 (0.12-0.97) 95% CI, p:0.033) are independent factors that reduce the risk of not returning to work.

Conclusion: It was found that more than half of the patients did not return to work. The low level of education and employment in non-public sectors posed the risk of not returning to work. It may be possible for patients to return to work with well-planned options, such as part-time shifts.

Keywords: Autologous stem cell transplantation, Chemotherapy, Employment, Lymphoma

1. Background

Approximately 85,000 new cases of lymphoma are diagnosed annually in the US, and it is the fifth most common type of cancer (1). Treatment resistance or relapse is observed in nearly 15% of Hodgkin lymphoma (HL) patients and 30% of non-Hodgkin lymphoma patients with standard treatments (2). One of the treatment options in patients with relapsed/refractory lymphoma is autologous stem cell transplantation (ASCT) applied after high-dose chemotherapy (HDCT) (3,4). It should also be mentioned that upfront ASCT administration is preferred in some types of aggressive lymphoma (5). After ASCT, 5-year overall survival rates can reach up to 80% (6).

It is thought that cancer survivors experience some physical and social problems in their lives after completing their treatment. Emotional disorders, physical limitations, problems in family life as well as difficulties in returning to work are among them (7-11). It is thought that the demographic characteristics, treatment modalities, psychological conditions, and work-related issues of cancer

survivors have separate effects on their returning to work (12). While the effectiveness of ASCT in patients with lymphoma is accepted by all authors, HDCT-related late complications and changes in the quality of life of these patients after ASCT have been a matter of curiosity (13-16). The majority of patients diagnosed with lymphoma are in the working-age group. Therefore, returning to work after ASCT and the employment status of these patients are important problems (17,18).

2. Objectives

This study aimed to examine the rate of not returning to work in the post-treatment period and the factors that may affect employment status in patients with the diagnosis of relapsed/refractory lymphoma who have undergone ASCT.

3. Methods

3.1. Study design

This cross-sectional study was conducted from January to June 2020 at the Department of

Hematology, Ankara Oncology Research and Training Hospital, Health Sciences University, Ankara, Turkey. Local Ethics Committee approval was obtained before the beginning of the study.

Our hospital works as a comprehensive oncology center; approximately 150 bone marrow transplantations are performed annually in our hematology and stem cell transplantation clinic. Moreover, approximately 200 patients apply to our outpatient clinic daily.

3.2. Patients and Outcomes

The study population consisted of all patients who applied to our outpatient clinic and were diagnosed with lymphoma. The inclusion criteria were 1) age range of 18-65, 2) diagnosis of relapsed or refractory lymphoma, 3) experience of ASCT, and 4) remission without recurrence one year after ASCT. Patients who received oncological treatment had residual disease after ASCT, and had ASCT less than one year ago were excluded from the study.

Patients who met the inclusion criteria were informed about the study. The informed consent forms were given to those who were willing to participate in the study. After reading the informed consent form, those who accepted to participate in the study were interviewed by a hematologist through a face-to-face interview.

The primary objective of the study was to assess the rate of dropout or loss of occupation after ASCT. The secondary goal was to identify factors that could have an impact on unemployment.

3.3. Statistical analysis

Among the patients who completed the questionnaire, those who were working before ASCT

were included in the statistical analysis. The time between the date of ASCT and the date of completing the questionnaire was defined as the follow-up time. Those who did not work before ASCT were excluded from statistical analysis. The data were analyzed in IBM SPSS Statistics software for Windows (version 21.0). The relationships of employment status with demographic-, disease-, and treatment-related factors were analyzed using univariate analysis. It should be mentioned that a p-value of less than 0.05 was considered statistically significant.

4. Results

During the study, 978 patients who had applied to the hematology outpatient clinic were evaluated in terms of eligibility. In total, 115 patients who had undergone ASCT for lymphoma treatment were eligible for the study. It is noteworthy that eight patients did not want to participate in the study.

In total, 80 (74.8%) out of 107 patients included in the study were male, and the median age of subjects was 49.0 (21-63). Regarding the education level, 66 (61.7%) and 28 (26.2%) participants had primary and secondary school education, respectively. Moreover, the majority of the patients were married (n=90, 84.1%). All patient characteristics are summarized in [Table 1](#).

Before ASCT, 30 (28.0%), 17 (15.9%), 14 (13.1%), 16 (15.0%), and 30 (28.0%) patients worked in the private sector, were self-employed, public employee, retired, and unemployed, respectively. The median follow-up time was 34.8 months (12.4-124.7 months). During this follow-up period, 35 (57.3%) out of 61 patients did not return to work. Most of

Table 1. Demographic characteristics of patients.

Variables	(n=107)	%
Age (years), median (IQR)	49.0 (21.0-63.0)	
Gender		
Male	80	74.8
Female	27	25.2
Education level		
Primary school	66	61.7
Secondary school	28	26.2
Higher education	4	3.7
Illiterate	9	8.4
Marital status		
Single	17	15.8
Married	90	84.1
Working status before ASCT		
Private sector employee	30	28.0
Self-employed	17	15.9
Public employee	14	13.1
Retired	16	15.0
Unemployed	30	28.0
Monthly income		
<400 \$	79	73.8
401-800 \$	28	26.2
Type of lymphoma		
Hodgkin lymphoma	39	36.4
Non-Hodgkin lymphoma	68	63.6

IQR: interquartile range, ASCT: autologous stem cell transplantation

these patients had retired (n=29, 47.5%) while three (4.9%) patients quit working voluntarily and three (4.9%) patients were dismissed.

When the factors that may be associated with unemployment were examined, the univariate analysis indicated that education level, monthly income, and sector of employment were related to

not returning to work (Table 2). According to the results of the multivariate regression analysis, it was found that having a higher education level (OR: 0.32 [0.14-1.22] 95% CI, P=0.041) and being a public employee (OR: 0.30 (0.12-0.97) 95% CI, P=0.033) are independent factors that reduce the risk of not returning to work (Table 3).

Table 2. Univariate analysis of the characteristics of patients for the risk of not returning to work

Characteristics	Odds ratio (95% confidence interval)	P
Age (years)	0.88 (0.75-0.98)	0.09
Gender		
Male	Ref	
Female	0.75 (0.25-1.55)	0.31
Education level		
Primary school	Ref	
Secondary school	0.76 (0.55-2.11)	0.37
Higher education	0.29 (0.16-1.01)	0.03
Marital status		
Single	Ref	
Married	0.87 (0.65-0.98)	0.35
Working status before ASCT		
Private sector employee	Ref	
Public employee	0.27 (0.13-0.85)	0.02
Monthly income		
<400\$	Ref	
401-800 \$	0.32 (0.19-1.12)	0.04
Type of lymphoma		
Hodgkin lymphoma	Ref	
Non-Hodgkin lymphoma	0.88 (0.71-1.01)	0.81

ASCT: autologous stem cell transplantation

Table 3. Multivariate analysis of the characteristics of patients for the risk of not returning to work

Characteristics	Odds ratio (95% confidence interval)	P
Education level		
Primary school	Ref	
Secondary school	0.89 (0.67-2.98)	0.69
Higher education	0.32 (0.14-1.22)	0.041
Working status before ASCT		
Private sector employee	Ref	
Public employee	0.30 (0.12-0.97)	0.033
Monthly income		
<400\$	Ref	
401-800 \$	0.47 (0.17-1.32)	0.06

ASCT: autologous stem cell transplantation

5. Discussion

In this study, which included only lymphoma survivors, the not returning to work rate after ASCT was found to be 57.3% in patients who worked before ASCT. It was observed that having a higher level of education and being a public employee reduce the risk of not returning to work.

One of the first studies investigating the long-term socio-medical situation of hematological cancer survivors was performed by Abrahamsen et al. in 1998 in Norway (19). The aforementioned study was conducted on 459 HL survivors. According to its results, 95% of the patients returned to their work or education in the 18th month after the diagnosis, while 2% of the male and 3% of the female subjects did not have any job after the treatment. They also found that the majority of patients with HL were able to return

to social life.

In their cross-sectional study, Kiserud et al. investigated the long-term employment status and related factors of 312 lymphoma survivors who received ASCT after HDCT (12). According to the results, the employment rate before and after ASCT was 77%; however, this rate dropped to 58% during the follow-up period. Female gender, advanced age, presence of comorbidity, cognitive problems, and anxiety/depression were found to be associated with unemployment.

Winterling et al. carried out a study on 177 patients who had undergone allogeneic stem cell transplantation (allo-SCT) due to different hematological malignancies (20). They observed that the prevalence rate of patients with a full-time occupation decreased from 82% at the beginning, to 52% in the median 8-year follow-up after allo-SCT.

Moreover, they found that the prevalence rate of part-time working patients increased from 0% at the beginning to 27% after allo-SCT. In the aforementioned research, although there was a significant decrease in the proportion of patients with full-time occupations, it was observed that patients continued to work, albeit part-time. It was also found that patients who left work after allo-SCT had sick leave or disability pension.

Kirchhoff et al. in their research performed in the US have obtained similar to those of the previous study (21). They have investigated the return to work rate and related factors of patients who had undergone HSCT due to hematological malignancies in the first five years after HSCT. In the above-mentioned study, patients who were alive and relapse-free in the fifth year after HSCT were included in the analyses. Based on the results, 60%, 32%, and 8% of 88 patients who worked full-time before HSCT continued to work full-time, part-time, and stopped working after HSCT, respectively.

Mosher et al. reviewed 22 studies to investigate the physical, psychological, and social conditions of the patients after HSCT (22). As a result of this study, it was reported that returning to work gradually increased if there was no recurrence of malignancy in the following years after HSCT. In addition, the rate of returning to work increased from 61% at the end of the first year to 84% at the end of the fifth year. In the same study, it was mentioned that HSCT survivors in their 10th year were not different from control groups with the same age, gender, and race in terms of returning to work.

There are small differences in the rates of not returning to work after ASCT in the studies that have been mentioned so far (12,19-22). This may be due to the characteristics of the patients included in the studies and the different social security practices of countries, such as insurance, invalidity pension, and unemployment pension. Remarkably, in our patient group, the rate of not returning to work after ASCT was much higher than in the subjects of all previous studies. Treatments, such as chemotherapy and radiotherapy, given before ASCT may have caused permanent complications and limitations in the participants of this study. However, this is not the main reason for the high rate of not returning to work in them. Part-time work is not the frequently preferred method in our country and the majority of the patients were entitled to retirement pension after ASCT. In other studies, the proportion of patients who switched from full-time to part-time work is quite high. The rate of patients eligible for retirement pension is very low in these studies. These two reasons may have caused the rate of not returning to work to be higher in the present study.

Limitations

One of the limitations of this study was the

relatively small sample size. Another limitation was the lack of data on ASCT-related late toxicities and psychological problems, such as depression, which may lead to not returning to work. However, this study was one of the rare studies investigating the rate of not returning to work and related factors in a homogeneous patient group, such as lymphoma survivors after ASCT.

6. Conclusion

In this study, the not returning to work rate in patients who worked before ASCT was found to be 57.3%. It was observed that having a higher level of education and being a public employee reduce the risk of not returning to work. Finally, it should be noted that even after very important treatments, such as ASCT, it may be possible for patients to return to work with well-planned options, such as part-time shifts.

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None.

Footnotes

Authors' Contributions: J.Y. and MSD conceived and all authors reviewed the study conception and design. J.Y., T.N.Y., B.U.U., D.S., T.D., S.B., M.B., A.M., N.A.B., and D.İ. contributed to data collection and preparation. S.B., M.K.C., H.B., and J.Y. analyzed the data. All authors contributed to the interpretation of results. J.Y., M.S.D., M.K.C., and F.A. drafted the manuscript and all authors critically revised it. All authors read and approved the final manuscript.

Ethical Considerations: The present study followed the Declaration of Helsinki. Accordingly, informed consent was obtained from all participants. Moreover, approval was granted by the Ethics Committee of Health Sciences University, Dr. Abdurrahman Yurtaslan Ankara Oncology Research and Education Hospital (Date:06/11/2019 Number: 2019-11/450).

Conflicts of Interest: The authors declare that they have no conflicts of interest related to this study.

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