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Outcomes of allogeneic hematopoietic cell transplantation for lymphoma patients, a single-institution experience

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INTRODUCTION

Hodgkin's (HL) and non-Hodgkin (NHL) lymphomas are common hematologic malignancies with multiple treatment options. The conventional approach to relapsed HL and NHL patients has been high-dose therapy followed by autologous hematopoietic cell transplantation (HCT) [2]. Allogeneic HCT can provide cure to those patients who are ineligible for autologous HCT, patients who have relapsed after several lines of therapy, or after failure of autologous HCT [1]. Some centers offer allogeneic HCT to high-risk lymphoma patients in second complete remission, however, there have been no prospective comparative studies to evaluate the effectiveness of this approach [3-6]. This single-center study reports the outcomes of allogeneic HCT for lymphoma since 2005.

OBJECTIVE

To study and analyze the outcomes of lymphoma patients who underwent an allogeneic HCT at the Princess Margaret Cancer Centre, using Anti-thymocyte globulin and Post-transplant Cyclophosphamide and compare it with the other regimen outcome.

METHOD

We analyzed transplant outcomes among 116 patients who received allogeneic HCT for lymphoma at Princess Margaret Hospital between 2005 and 2021. The study was approved by the institutional research ethics board.

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RESULTS

Patient demographic and clinical characteristics are shown in **Table 1**. One hundred-sixteen individuals received allogeneic HCT for lymphoma 2005-2021: of these 10 (8%) had HL and 106 (92%) had NHL. The median age was 48 years (range: 20-69) and 74 (64%) were male. Twenty-five (22%) patients had a prior autologous HCT. At the time of transplant, 38 (33%) patients were in complete remission, 67 (58%) in partial remission and 11 (9%) had stable disease. Sixty-six (57%) patients received myeloablative conditioning (MAC), whereas 50 (43%) received reduced-intensity conditioning. Of all subjects, 51 (44%) had a matched sibling donor, 41 (35%) matched unrelated donor, 15 (13%) mismatched unrelated donor and 9 (8%) received haploidentical donor grafts. The median hematopoietic cell transplant comorbidity index was 1 (range: 0-5).

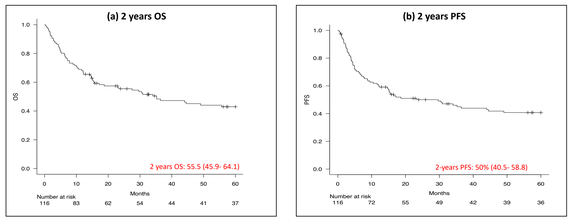
The median follow-up was 29 months (range: 0.93-213.6). The median CD34+ cell dose was 6.8×10^6/kg. The median neutrophil and platelet engraftment times was 16 days (range: 4-35) and 13 days (range: 0- 184). Progression-free survival and overall survival at two years were 50% (95% CI: 40.5-58.8) and 55.5% (95% CI: 45.9-64.1). Transplant-related mortality was 10.4% (95% CI: 5.7-16.8) at 100 days and 28.1% (95% CI: 20.1-36.6) at two years. Cumulative incidence of relapse at two years was 21.9% (95% CI: 14.8-29.9).

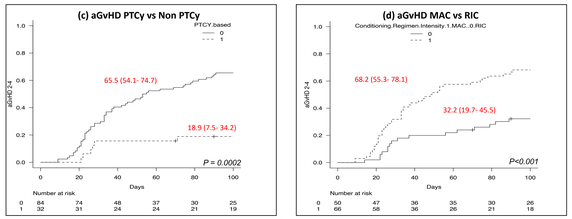
At day-100, the incidence of grade 2-4 and grade 3-4 acute graft-vs-host disease (GVHD) was 52.8% (95% CI: 43.2-61.4) and 23.7% (95% CI: 16.3- 31.9), respectively. The incidence of moderate-severe cGVHD at two years was 31.1% (95% CI: 22.7-39.8). Graft-vs-host disease- and relapse-free survival at two years was 21.8% (14.7-29.8).

In univariate analysis, conditioning intensity didn't impact on overall survival (55.8.2% vs. 54.9% [P= 0.39]; HR=0.81 [95% CI: 0.49- 1.32], P= 0.40]) nor GRFS (22.7% vs. 20.5% [P<0.81]; HR=0.95 [95% CI: 0.63- 1.43], P= 0.81]), as well as use of post-transplant cyclophosphamide (PTCy) in GVHD prophylaxis didn't impact on overall survival (60.3% vs 53.5% [P<0.3]; HR=0.72 [95% CI: 0.39- 1.33], P= 0.30]) & GRFS (25.7% vs. 20.2% [P<0.38]; HR=0.81 [95% CI: 0.50-1.30], P= 0.38]). Compared to patients who received RIC, subjects who received MAC had a higher incidence of grade 2-4 (68.2% vs. 32.2% [P<0.001]; HR=2.52 [95% CI: 1.51- 4.22], P= 0.0003]) and grade 3-4 aGVHD (31.8% vs. 12.8% [P=0.046]; HR=2.23 [95% CI: 1.01- 4.89], P= 0.046]), but in multivariate analysis, MAC doesnot have an impact on grade 3-4 aGVHD (HR=1.33 [95% CI: 0.61- 2.85], P = 0.47). Use of PTCy had a significant impact on acute GVHD, with lower risk of grade 2-4 aGVHD (HR=0.24 [95% CI: 0.11-0.52], P = 0.0002) and grade 3-4 aGVHD (HR=0.19 [95% CI: 0.04-0.82], P = 0.02).

Table1: Patient characteristics

	N=116
Age at transplant in years (median, range)	48 (20-69)
Male	74 (64)
Female	42 (36)
Transplant indication (N, %)	
HL	10 (8.6)
DLBCL	5 (4.3)
FL	54 (46.6)
MCL	11 (9.5)
TCL	27 (23.3)
Other	9 (7.7)
Previous autologous HCT (N, %)	25 (22)
Disease stage at diagnosis (N, %)	
I-II	4 (3.4)
III-IV	112 (96.6)
Disease status at allogeneic HCT (N, %)	
CR	38 (33)
PR	67 (58)
Stable	11 (9)
HCT-CI (median, range)	1 (0-5)
Donor-recipient ABO (N, %)	
Matched	72 (62)
Major/bidirectional mismatch	26 (22)
Minor mismatch	18 (16)
Time from diagnosis to allogeneic HCT in months	45 (5.5- 341)
Conditioning regimen intensity (N, %)	
MAC	66 (57)
RIC	50 (43)
Donor type (N, %)	
MSD	51 (44)
MUD	41 (35)
MMUD	15 (13)
HID	9 (8)





CONCLUSIONS

AlloHCT continues to be a valuable curative approach for relapsed refractory lymphoma, with an optimal two-year overall survival rate exceeding 55%, although these patients have undergone extensive prior transplant.

The intensity of conditioning does not significantly affect overall survival or Graft-versus-Host Disease-free, relapse-free survival (GRFS), making reduced-intensity conditioning (RIC) the preferred regimen.

While the use of a PTCy-based protocol effectively controls GVHD, it does not have a significant impact on overall survival or GRFS. However, longer follow-up and further studies are needed to validate these findings.

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