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Following Hematopoietic Cell Transplantation (HCT), Specific Variables Demonstrate Associations with Self-Reported Physical and Mental Well-Being

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Introduction

With increased survival rates due to advancements in cancer treatments, there is growing attention on the quality of life (QoL) of survivors. Both the disease itself and its treatments have the potential to impact the physical and emotional well-being of long-term survivors. Additionally, the presence of comorbid medical conditions and psychosocial factors can also influence these issues. Psychosocial factors, such as personality traits and social support, may either positively or negatively affect perceived QoL [1].

Hematopoietic cell transplantation (HCT) serves as a significant treatment for hematologic malignancies and certain solid tumors. Previous studies have indicated that various factors are linked to overall, physical, and emotional health-related QoL following HCT. These factors include age at transplantation, employment status at transplantation, educational status, marital status, family functioning at the time of transplantation, social support, pre-HCT QoL, medical comorbidities, transplant type [2], intensity of conditioning regimen, time after transplantation, development of acute or chronic graft-versus-host disease (aGVHD, cGVHD), osteoporosis or other long-term complications, ongoing medication requirements, and relapse. In the case of children, family functioning and individual characteristics such as resilience and social skills, socioeconomic status, and the intensity of treatment were significant factors, while age and gender were not significant [3].

However, findings regarding the impact of certain factors, such as the intensity of conditioning regimen, have been inconsistent across studies. Similarly, in a study involving leukemia survivors who did not undergo transplantation, gender and education were found to be related to QoL. The disparities in findings across studies may stem from methodological limitations, such as small sample sizes, the use of convenience samples, variability in patient populations at different centers, and the utilization of different assessment tools to evaluate the outcomes of interest [4].

Discussion

We conducted a comparison of 916 cases of Diffuse Large B-Cell Lymphoma (DLBCL) undergoing either autologous (n = 837) or matched HLA-identical sibling allogeneic (n = 79) hematopoietic cell transplantation (HCT) between 1995 and 2003. Factors considered when determining whether to recommend autologous or allogeneic transplantation for DLBCL include implicit differences in treatment-related mortality (TRM), concerns over disease relapse in an autograft, inability to collect hematopoietic stem cells, and the potential benefits of a Graft-Versus-Lymphoma (GVL) effect from an allograft [5]. Allogeneic transplantation is thus typically offered to patients perceived to be at lower risk for TRM and at higher risk for disease relapse or progression.

While nonmyeloablative (NMA) and reduced-intensity conditioning (RIC) regimens are becoming less common in allogeneic HCT for NHL, approximately two-thirds of allografts for DLBCL reported to the CIBMTR utilized myeloablative (MA) regimens, indicating the widespread use of this approach. The differences observed between the cohorts in terms of patient, disease, and transplant-related characteristics reflect a clear effect of patient selection, with the allogeneic transplant cohort having a lower median age, higher prevalence of extranodal and marrow involvement, and more resistant, higher-risk disease. Differences in graft source and the reduced use of total body irradiation (TBI) in conditioning regimens are consistent with the MA transplant approach [6].

In our analysis, we controlled for pretransplant imbalances between the cohorts in two separate statistical analyses, yielding very similar results. In a multivariate Cox model comparing all autograft recipients to the allograft cohort, overall TRM after allogeneic transplant was significantly higher than after autologous HCT. This difference was primarily driven by higher TRM in the first 12 months after allogeneic transplant, with no difference observed in survivors beyond 12 months. In a prospective study by the Johns Hopkins group [7], 100-day TRM was reported as 33.3% for allogeneic HCT recipients versus 17.4% for autologous HCT recipients ($P = .03$). TRM remained significantly higher for allograft HCT recipients after 100 days (17.8% versus 6.5%, $P < .001$). Similarly, Ratanatharathorn and colleagues reported in their prospective comparison that 12 out of 16 deaths in the allogeneic HCT group were unrelated to NHL, compared to only 4 out of 22 in the autologous HCT population. These findings align with our data, where 31 out of 60 deaths in the allogeneic group were unrelated to cancer, compared to 110 out of 414 deaths in the autologous group [8].

Demographic and clinical variables routinely assessed by transplant teams were moderately associated with self-reported physical health. This association was also observed in self-reported and clinician-assessed performance scores and the presence of graft-versus-host disease (GVHD) in HCT survivors. However, demographic and clinical factors accounted for very little of the variance in long-term mental health (< 10%) [9]. This underscores the independence of these mental and physical health outcomes. Other studies have reported similar findings. For example, one study found no association between

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transplant type or chronic GVHD with physical limitations and no association between type of transplant or pre-transplant medical complications with depression. However, other studies have suggested that allogeneic HCT and especially chronic GVHD are associated with poorer mental health [10].

Acknowledgment

None

Conflict of Interest

None

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