Risk Factors and Outcome Predictors of Chronic GVHD Post Allogenic HSCT in Pediatric Cancer Patients: A Single Center Experience from a LMIC Setting

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Introduction

Despite recent advances in donor selection, conditioning regimens, graft manipulation, and supportive care, chronic GVHD (cGVHD) remains the leading cause of post-transplant morbidity and mortality. It is the most devastating complication following allogenic hematopoietic stem cell transplant (HSCT), with a huge impact on patients' quality of life (QOL). Knowledge of risk factors to develop cGVHD, as well as predictors of outcome in patients who develop cGVHD, is of utmost importance in predicting its risk and thereby early intervention and prompt treatment initiation.

Aim

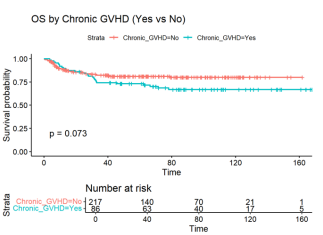
Our aim is to assess the risk factors to develop cGVHD in pediatric cancer patients with hematological malignancies who underwent allogenic HSCT from matched sibling donors, and also to determine their predictors of outcome.

Objectives

- To assess risk factors for developing cGVHD
- To determine outcome predictors in patients who develop cGVHD.

Methods

This retrospective analysis included a total of 304 patients aged 0.9-19.3 years, who underwent allogenic HSCT with either peripheral blood or bone marrow as a stem cell source between January 2007 to December 2020. They all received the same GVHD prophylaxis, consisting of cyclosporine and methotrexate. Diagnosis and scoring of cGVHD was done in accordance with the National Institute of Health (NIH) Consensus Criteria 2014.
Univariate as well as multivariate analysis was performed to assess the strength of the proposed risk factors.



Results

86 patients developed cGVHD, representing an incidence of 28.3%. In the multivariate logistic regression analysis, the source of stem cells (bone marrow vs. peripheral blood) was not significantly associated with the occurrence of cGVHD (OR = 1.36, 95% CI: 0.76-2.41, p = 0.3). Pre-transplant fungal infections, despite a high prevalence in our cohort (21.67%), did not show a significant association with cGVHD (OR = 0.66, 95% CI: 0.38-1.14, p = 0.14). Acute GVHD was significantly associated with the occurrence of cGVHD, with a higher odds ratio (OR = 3.68, 95% CI: 2.09-6.51, p < 0.001). Outcome predictors in patients who developed cGVHD were also analyzed; 48 cases (55.8%) had severe cGVHD. 61 patients (70.9%) had multiple organ involvement. Regarding the involvement of risk organs, 31 cases (36%) had liver involvement, while 19 cases (22.1%) had gastrointestinal involvement, and 30 patients (28.3%) developed lung cGVHD. Most of our patients (n=65, 75.6%) were steroid responders. None of the proposed outcome predictors had an impact on OS, EFS, or CIR.

Summary

This study analyzed 304 pediatric patients with hematological malignancies who underwent allogeneic HSCT from 2007 to 2020, focusing on risk factors and outcomes related to cGVHD. Incidence of cGVHD was 28.3%, with acute GVHD significantly associated with its occurrence. Among patients with cGVHD, 55.8% had severe cases and 70.9% experienced multiple organ involvement. The most affected organs were the liver, gastrointestinal tract, and lungs, with 75.6% responding well to steroids. However, none of the predictors influenced overall survival or event-free survival.

Discussion

With increasing survival rates, focus on improving QOL becomes essential. Given that acute GVHD is a major risk factor for cGVHD, predicting occurrence of cGVHD and implementing timely interventions are critical. Further studies are needed to identify key predictors of long-term outcomes.

References

1. The 2014 Ancillary Therapy and Supportive Care Working Group Report, Biology of Blood and Marrow Transplantation
2. Late Effects Surveillance Recommendations among Survivors of Childhood Hematopoietic Cell Transplantation: A GOG Report, Biology of Blood and Marrow Transplantation
3. Risk factors associated with increased non-relapse mortality and with poor overall survival in children with chronic graft-versus-host disease, Blood