Hematopoietic Cell Transplant Co-Morbidity Index (HCT-CI): Ability to Predict Outcomes in Haploidentical (HI) Hematopoietic Stem Cell Transplantation (HSCT)

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Introduction

We developed a 2 step approach to HI HSCT in which a fixed dose of allogeneic T cells are infused after reduced intensity (RIC) or myeloablative conditioning (HSCT step 1). After 2-3 days, cyclophosphamide (CY) 60 mg/kg/d x 2 is given to establish bidirectional tolerance. One day after the CY, a CD 34 selected stem cell product is infused (HSCT step 2).

This approach has been associated with a low incidence of non-relapse mortality (NRM) resulting in a significant improvement in overall survival (OS) in patients (pts) undergoing HI HSCT at our institution. This abstract examined the predictability of this tool in pts undergoing the 2 step HI HSCT.

Methods

We retrospectively analyzed pts treated on 2-step HI protocols. Groups were divided into 3 previously described risk groups: 0, 1-2, and ≥ 3. Survival data was calculated according to Kaplan-Meier methods.

Results

We identified 157 pts; 61 female, 96 male, median age 55 (range 19-78), 34% undergoing RIC HSCT with complete HCT-CI data who were transplanted from 2007 through 2013. 23 pts (15%) had a HCT-CI score of 0, 55 (35%) had a score of 1-2, and 79 (50%) had a score of ≥ 3. A HCT-CI score of 0 was associated with a significantly increased OS (p=0.039) with median survival not reached for HCT-CI score 0 or score 1-2 versus 21 months with score ≥ 3 (fig. 1). We also examined the predictability of the HCT-CI on OS of pts with (54%) versus without (46%) disease at HSCT, and found that differences (figures 2-3) between HCT-CI groups were limited to pts with disease at time of HSCT (p=0.003 vs p=0.765). Twenty nine of 157 (19 %) died of NRM: 3 pts (10%) in the 0, 8 (28%) in the 1-2, and 18 (62%) in the ≥ 3 score groups respectively.

Discussion/Conclusion

This analysis of the HCT-CI suggests its ability to correctly identify pts in the lowest score category as being at decreased risk for mortality. Predictability of OS in pts with higher scores was limited to those with disease at the time of HSCT. There was also a suggestion that higher scores correlated with increased rates of NRM. Of note, both the percent of pts with ≥3 points and their OS was higher in the 2 step group than what was reported by Sorror et al in 2005. While we believe this is due in part to the low NRM associated with the 2 step method even in higher risk groups, we also note that more of the 2 step pts had 2-3 points for low PFTs (80% vs 33%). This indicates that the calculation of pulmonary function as measured at our institution may have inflated the high risk numbers, affecting optimal use of the tool. Next steps include assessing PFT methodology as it affects the HCT-CI as well as assessing the utility of other comorbidity indices in conjunction with the HCT-CI, including Karnofsky performance score.

Figure 1: Overall Survival by HCT-CI Score

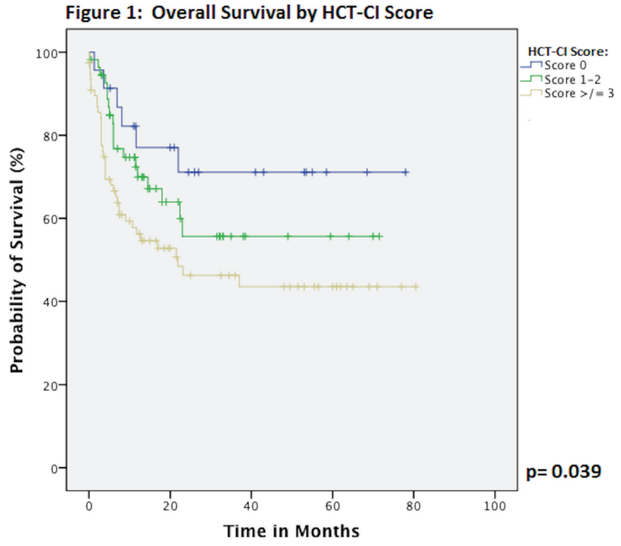

Figure 2: Overall Survival With Disease at HCT

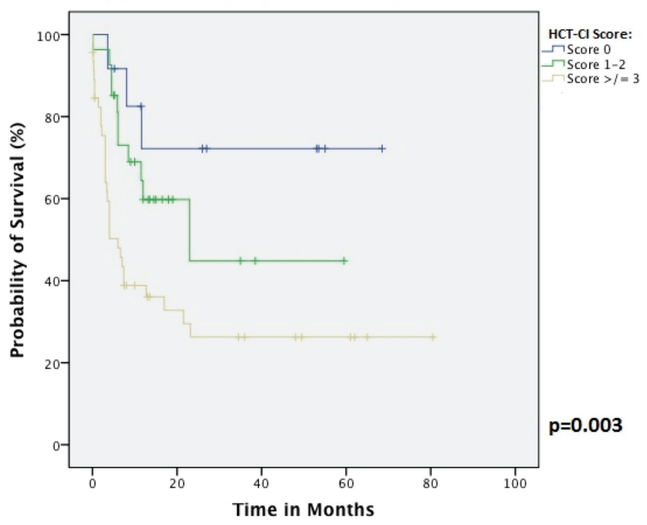

Figure 3: Overall Survival Without Disease at HCT