Age-Based Comparison of Stem Cell Transplantation during the First Line of Therapy for Multiple Myeloma Patients

Jorge Arturo Arturo Hurtado Martinez, MD[1*], Jay R. Hydren, PhD[1*], Patricia Alejandra Flores Pérez, MD[1*], Mason S. Barnes[1*], Felipe Flores Quiroz, MD[1*], Nathan Sweeney, PhD[2], Karla Mariana Castro Bórquez, MD[1*], Andrea Isabel Robles Espinoza, MD, MBA[1*] and Jennifer M. Ahlstrom, BA[1*]

[1] HealthTree Foundation, Lehi, UT

[2] Tempus, Chicago, IL

BACKGROUND

High-dose chemotherapy followed by stem cell transplantation (SCT) has been the standard first-line therapy for eligible multiple myeloma (MM) patients for over three decades. However, most studies evaluating SCT in MM have focused on patients under 65 years old, despite the increasing number of older patients diagnosed with MM. Retrospective data suggest that SCT can offer good survival outcomes with acceptable toxicities in patients over 65. This registry retrospective study aims to compare the time to next treatment (TTNT) of SCT versus non-SCT treatments in MM patients, assessing those aged <65 and ≥65 years old.

METHODOLOGY

Using HealthTree Cure Hub for Multiple Myeloma (PMID: 35271305), we analyzed realworld data from 1279 patients with multiple myeloma. Patients were categorized into two groups based on age at the start of their first line of therapy (<65 and ≥65). Kaplan-Meier 'Time to Next Treatment' (TTNT) R analysis was employed to compare patients who underwent stem cell transplant (SCT) and those who did not (NSCT) within each age group. SCT patients received a high-dose melphalan preparative regimen (140–200 mg/m2). Age groups were also subclassified by high-risk cytogenetics, using mSMART staging by fluorescence in situ hybridization (FISH), and Revised International Staging System (R-ISS) stage. Chi-square tests were used to assess the association with R-ISS and mSMART stages.

RESULTS

We analyzed the data of 1279 MM patients, of whom 830 (64.9%) were <65 and 449 (35.1%) were ≥65. The <65 group had a mean age of 55±7, whereas the group ≥65 had a mean age of 70±5. 52.5% were female. The majority of patients were White (78.2% in the <65 group and 81.77% in ≥65), with other relevant groups including Blacks (5.8% in the <65 group and 4.2% in the ≥65 group), and Hispanics or Latinos (4.0% in the <65 group and 2.8% in the ≥65 group). The median year of diagnosis was 2018 (2006-2022). R-ISS staging was available for 664 patients and not dissimilar between groups (p = 0.69): in the <65 group, 159 (37.2%) patients were classified as R-ISS stage I, 188 (44.0%) patients stage II, and 81 (18.9%) patients stage III. In the ≥65 group, 81 (34.3%) were stage I, 118 (50.0%) stage II, and 37 (15.7%) stage III. 1196 patients had mSMART staging available, of whom, patients with high-risk, double, and triple hit, represented 15.9%, 4.6%, and 0.4%, respectively. Age group high-risk characteristics proportions were not dissimilar (p = 0.7).

In the <65 group, 69.2% had a transplant during their first line of therapy, while in the ≥65 group, 48.8% had a transplant. For patients aged <65, the mean TTNT was 32.5 mo (SD 25) in the SCT group, and 16 mo (SD 21.6) in the NSCT group. For patients aged ≥65, the mean TTNT was 28.6 mo (SD 18.9) in the SCT group, and 16.5 mo (SD 18.3) in the NSCT group. The TTNT survival at 4 years was significantly higher in patients that experienced an SCT in both groups, <65 (SCT=40%, NSCT=18%, p = <0.0001) and ≥65 (SCT=43%, NSCT=14%, p = <0.0001).

Time to Next Treatment Analysis Younger than 65

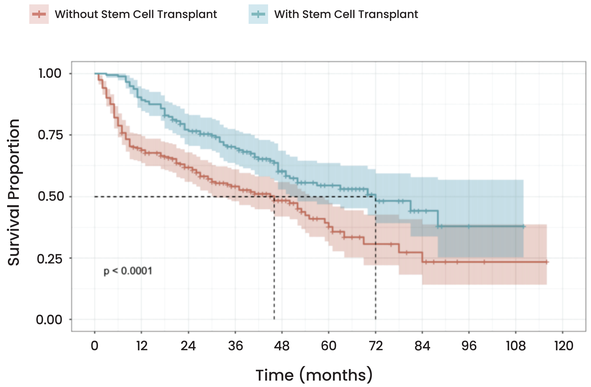

Figure 1. Time to next treatment (TTN) in patients <65 years, TTNT was 32.5 mo (SD 25) in the Stem Cell Transplant (STC) group and 16 mo (SD 21.6) in the Non-Stem Cell Transplant (NSCT) group. Survival at four years is higher for SCT as well.

Time to Next Treatment Analysis 65 years or older

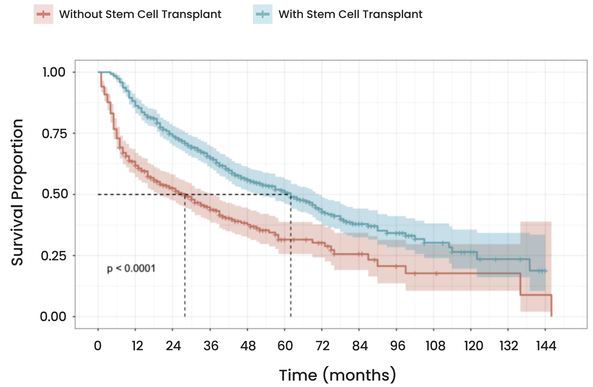

Figure 1. Time to next treatment (TTN) in patients >65 years, mean TTNT, and survival at 4 years were higher in the Stem Cell Transplant (SCT) group.

CONCLUSION

Our findings add to the compelling evidence that SCT demonstrates favorable outcomes in both age groups of MM patients. The mean TTNT difference of SCT vs NSCT observed in the <65 group is 16.5 mo, and in the ≥65 group, it is 12.1 mo. Furthermore, patients who underwent SCT in both age groups had significantly higher TTNT survival rates at 4 years, doubling the rates to 40% in the <65 group and 43% in the ≥65 group, emphasizing the substantial benefits of SCT as a first-line therapy for multiple myeloma. These results contribute to the growing body of evidence supporting the efficacy and acceptability of SCT in the management of multiple myeloma across all age groups. It also emphasizes the importance of considering SCT as a viable treatment option for eligible MM patients, including those aged 70 and above, to improve long-term outcomes.