

Comparison of high dose melphalan and busulfan plus melphalan as a conditioning regimen

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Background/Aims: High dose melphalan (HDMEL) is considered the standard conditioning regimen for autologous stem cell transplantation in multiple myeloma patients. Recent studies showed that busulfan plus melphalan (BUMEL) was comparable to HDMEL as conditioning regimen. We compared the efficacy of HDMEL and BUMEL in multiple myeloma who underwent autologous stem cell transplantation with a conditioning regimen.

Methods: This is a single-center, retrospective study including multiple myeloma patients who underwent autologous stem cell transplantation with a conditioning regimen in Seoul National University Hospital between December 2015 and December 2019.

Results: A total of 113 patients with a median age of 57.0 years (range : 33 – 64 yrs) at autologous stem cell transplantation were included. Eighty-one (71.7%) received HDMEL and 32 (28.3%) received BUMEL as a conditioning regimen. Median progression free survival (PFS) for BUMEL was not reached while the median PFS for HDMEL was 31.5 months (HR 1.052, 95% confidence interval [CI] 0.496-2.228, p = 0.895). Some side effect showed significantly difference between HDMEL and BUMEL. BUMEL group showed more mucositis (p = 0.002) and thrombocytopenia requiring transfusion (p = 0.035), higher aspartate aminotransferase level (p = 0.031), longer hospitalization (p = 0.000) than HDMEL group.

Conclusions: BUMEL showed similar efficacy compared to HDMEL. But we should be careful in terms of toxicity with BUMEL.

TABLE 1. Demographic characteristics

| Characteristics | HDMEL (n=81, 71.7%) | BUMEL (n=32, 28.3%) | P |
|--------------------|------------------------|------------------------|-------|
| Age at diagnosis | Median (range, range) | Median (range, range) | 0.602 |
| Age at transplant | Median (range, range) | Median (range, range) | 0.000 |
| Sex | Male | Male | 0.763 |
| Female | Female | Female | 0.237 |
| Performance status | ECOG 0 | ECOG 0 | |
| ECOG 1 | 1 (1.2%) | 1 (3.1%) | 0.703 |
| ECOG 2 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 3 | 2 (2.5%) | 7 (21.9%) | |
| ECOG 4 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 5 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 6 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 7 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 8 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 9 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 10 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 11 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 12 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 13 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 14 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 15 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 16 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 17 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 18 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 19 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 20 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 21 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 22 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 23 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 24 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 25 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 26 | 0 (0.0%) | 0 (0.0%) | |
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| ECOG 28 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 29 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 30 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 31 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 32 | 0 (0.0%) | 0 (0.0%) | |
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| ECOG 36 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 37 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 38 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 39 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 40 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 41 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 42 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 43 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 44 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 45 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 46 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 47 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 48 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 49 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 50 | 0 (0.0%) | 0 (0.0%) | |
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| ECOG 69 | 0 (0.0%) | 0 (0.0%) | |
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| ECOG 80 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 81 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 82 | 0 (0.0%) | 0 (0.0%) | |
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| ECOG 85 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 86 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 87 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 88 | 0 (0.0%) | 0 (0.0%) | |
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| ECOG 172 | 0 (0.0%) | 0 (0.0%) | |
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| ECOG 187 | 0 (0.0%) | 0 (0.0%) | |
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| ECOG 191 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 192 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 193 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 194 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 195 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 196 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 197 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 198 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 199 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 200 | 0 (0.0%) | 0 (0.0%) | |

TABLE 2. Outcomes of autologous stem cell transplantation

| Characteristics | HDMEL (n=81, 71.7%) | BUMEL (n=32, 28.3%) | P |
|-------------------------------------|------------------------|------------------------|-------|
| Time to relapse/progression, months | Median (range, range) | Median (range, range) | 0.702 |
| Time to relapse/progression, days | Median (range, range) | Median (range, range) | 0.000 |
| ECOG 0 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 1 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 2 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 3 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 4 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 5 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 6 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 7 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 8 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 9 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 10 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 11 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 12 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 13 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 14 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 15 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 16 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 17 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 18 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 19 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 20 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 21 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 22 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 23 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 24 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 25 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 26 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 27 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 28 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 29 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 30 | 0 (0.0%) | 0 (0.0%) | |
| ECOG 31 | | | |