**Title: Comparison of the efficacy and safety between single-dose etoposide and G-CSF plus patient-adapted plerixafor mobilization for patients with multiple myeloma: A preliminary study**

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**Background:** Considering high-dose chemotherapy followed by autologous stem cell transplantation (ASCT) is still standard-of-care in eligible multiple myeloma (MM) patients, the collection of sufficient count of CD34+ cells to transplant without significant morbidity and mortality is major challenge.

**Methods:** To address this issue, we have compared the efficacy and safety of two stem cell mobilization regimens, single-dose etoposide (the EP group; 375 mg/m2 for 1 day; n = 45) and G-CSF + patients-adapted (peripheral blood [PB] CD34+ cell count < 15 /µL) plerixafor (the G-CSF group; n = 18) which have been used between Jan 2019 and Dec 2019 in our institutions.

**Results:** The median ages of the EP and G-CSF groups were 61 (range, 33 – 81) and 63 (range, 46 – 69) years (*P* = 0.226). Other clinical and treatment-related characteristics, including the proportion of patients who received lenalidomide-containing induction chemotherapy (11.4% vs. 5.6%; *P* = 0.662), were not significantly different (*P* > 0.050) between two groups. No patients of the EP group underwent apheresis procedure for two or more days, whereas 4 (22.2%) of the G-CSF group underwent apheresis procedure for two days. In addition, ten (55.5%) patients of the G-CSF group received one dose of plerixafor administration. The optimal collection rate (≥ 6 × 106/kg CD34+ cells) of the EP group was significantly higher compared to that of the G-CSF group (93.2% vs. 44.4%; *P* < 0.001). However, the adequate collection rate (≥ 3×106/kg CD34+ cells) of two groups were not significantly different (100% vs. 94.4%; P = 0.290). The failure of collection (< 2×106/kg CD34+ cells) and grade 3 or worse toxicity were not observed in both the EP and the G-CSF groups.

**Conclusions:** This preliminary study showed significantly higher optimal collection rate of the EP group, compared to the G-CSF group. However, most of patients in both groups achieved adequate collection for receiving single transplantation without significant toxicities. Single-dose etoposide may be preferable option for patients to need tandem transplantation. Our results will be confirmed by well-designed phase III prospective study, which are planned by our myeloma study group.