



Long-Term Outcomes From the Phase 3 OCEAN (OP-103) Study: Melphalan Flufenamide (Melflufen) and Dexamethasone Versus Pomalidomide and Dexamethasone in Relapsed Refractory Multiple Myeloma

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CONCLUSIONS

- Long-term results of the OCEAN study reported here were consistent with previous analyses¹
- Overall survival (OS) outcomes continued to be more favorable with melflufen + dexamethasone (dex) in patients with no prior autologous stem cell transplant (ASCT) or with time to progression (TTP) >36 months after ASCT (defined as the target population)
 - OS in the intention-to-treat (ITT) population, however, trended in favor of pomalidomide (pom) + dex
- No new safety signals were reported
 - The safety of melflufen + dex primarily consisted of hematologic adverse events that were manageable with dose modifications, which is consistent with previous reports¹⁻⁴
- This long-term follow-up of OCEAN confirms the favorable safety and overall survival outcomes of melflufen + dex in the target population and supports its continued use as a treatment choice for patients with relapsed refractory multiple myeloma (RRMM)

BACKGROUND

- Melphalan flufenamide (melflufen) is a first-in-class peptide-drug conjugate that utilizes increased peptidase expression to selectively release potent alkylating agents inside tumor cells¹ (Suppl Fig 1)
- Based on results of the phase 2 HORIZON study and supported by the phase 3, randomized, controlled OCEAN study¹ melflufen was approved in Europe for use in patients with triple-class refractory multiple myeloma with ≥3 prior lines of therapy (LoTs) and without prior ASCT or with a TTP >36 months after prior ASCT
- In the OCEAN study, melflufen + dex showed superior progression-free survival (PFS) compared with pom + dex (6.8 vs 4.9 months; hazard ratio [HR]: 0.79; P=0.032)
 - PFS benefit in the melflufen + dex arm was mainly driven by patients who had not received prior ASCT
- OS in the ITT population was not different between the melflufen and pom arms (HR: 1.10; P=0.47) at a median follow-up of 19.8 vs 18.6 months¹
 - However, OS trended in favor of melflufen + dex in patients without prior ASCT and favored pom + dex in patients with prior ASCT¹
- Post-hoc analyses of OCEAN and HORIZON demonstrated that a TTP <36 months after prior ASCT was a negative prognostic factor for OS with melflufen + dex¹

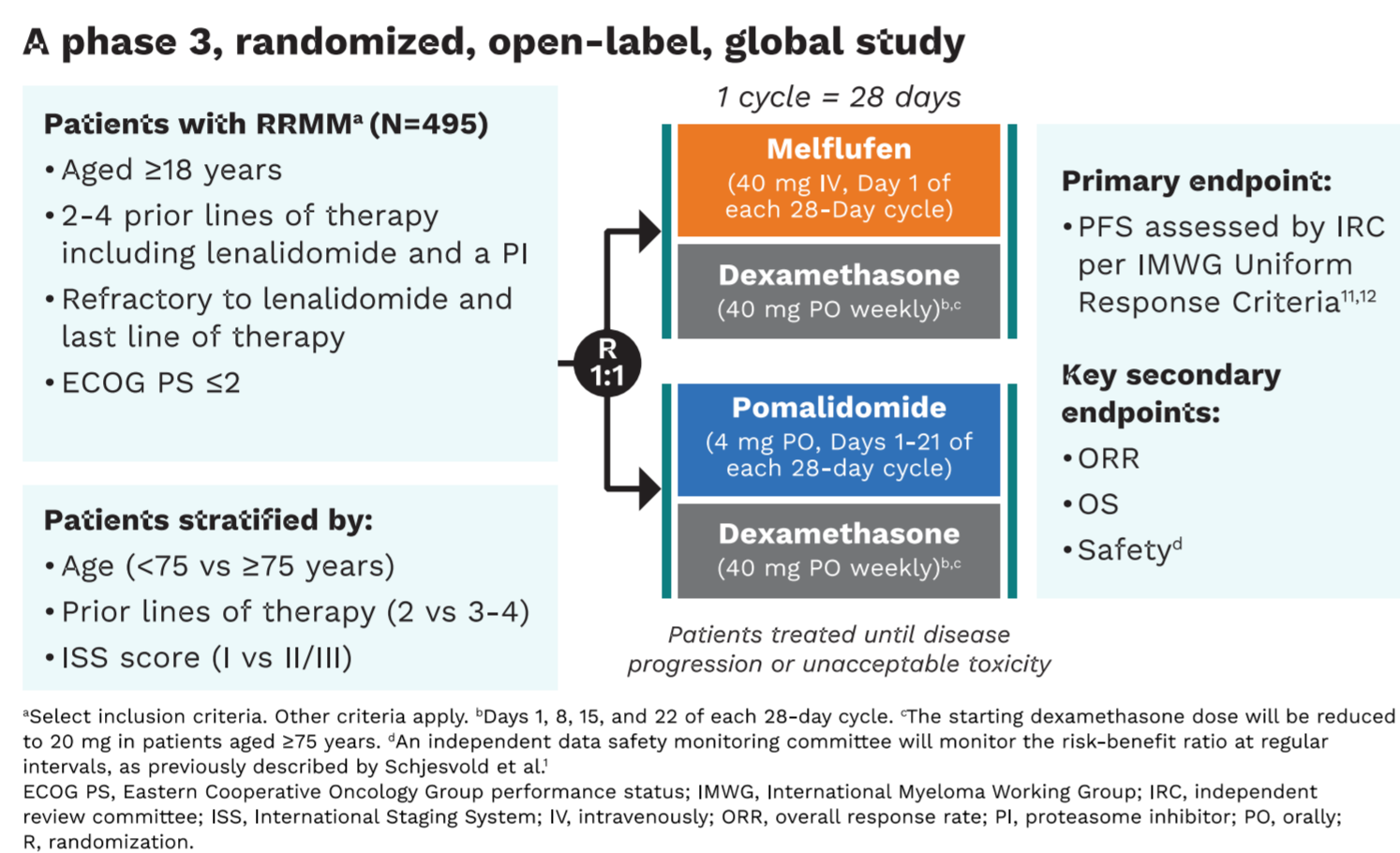
OBJECTIVE

Here, we present long-term OS and safety data (2-year follow-up from the initial data cut) from the final analysis of the OCEAN study (OP-103; NCT03151611) in patients with RRMM treated with melflufen + dex or pom + dex

METHODS

- The OCEAN study was a randomized phase 3, head-to-head study of melflufen + dex compared with pom + dex in patients with RRMM who had disease refractory to lenalidomide and last line of therapy (Figure 1)
- Patients must have received 2-4 prior LoTs including lenalidomide and a proteasome inhibitor
- Patients were randomized 1:1 (stratified by age, number of prior LoTs, and International Staging System score) to receive either
 - 28-day cycles of melflufen 40 mg intravenously on day 1 OR pom 4 mg orally daily on days 1 to 21
 - All patients received dex 40 mg (20 mg for patients ≥75 years) orally on days 1, 8, 15, and 22
- Analyses were performed in
 - The ITT population: all patients assigned to treatment
 - The safety analysis set: all patients who received at least 1 dose of melflufen, pom, or dex
 - The target population: patients without a prior ASCT or TTP >36 months after an ASCT

Figure 1. OCEAN Study Design



RESULTS

- As of the data cutoff date of February 3, 2023, 228 of 246 (93%) patients randomized to the melflufen arm, and 246 of 249 (99%) patients randomized to the pom arm, received at least 1 dose of study drug, and were included in the safety analysis (Suppl Fig 2)
 - In both arms, the most frequent reasons for treatment discontinuation were progressive disease (57% and 69%) and adverse events (AEs, 21% and 16%)
 - In both arms, the most frequent reasons for study discontinuation were death (73% and 68%) and study terminated by sponsor (18% and 22%)
- Baseline characteristics are shown in Table 1
 - The median age was 68 years (range, 39-91)
 - Patients had received a median of 3 prior LoTs

Table 1. Baseline Patient Characteristics

Characteristics	Melflufen + Dex (n=246)	Pom + Dex (n=249)
Age, median (range), years	68 (41-91)	68 (39-87)
<65 years, n (%)	96 (39)	85 (34)
65 to <75 years, n (%)	113 (46)	125 (50)
≥75 years, n (%)	37 (15)	39 (16)
Male sex, n (%)	139 (57)	140 (56)
ECOG PS (0/1/2), %	37/53/11	37/55/8
ISS score (I/II/III) at study entry, %	48/38/13	50/38/12
High-risk cytogenetics at study entry, n (%) ^a	83 (34)	86 (35)
EMD at study entry, n (%)	31 (13)	31 (12)
Previous lines of therapy, median (range)	3 (2-4)	3 (2-4)
2 vs 3 or 4, %	46/54	45/55
Previous ASCT, n (%)	125 (51)	120 (48)

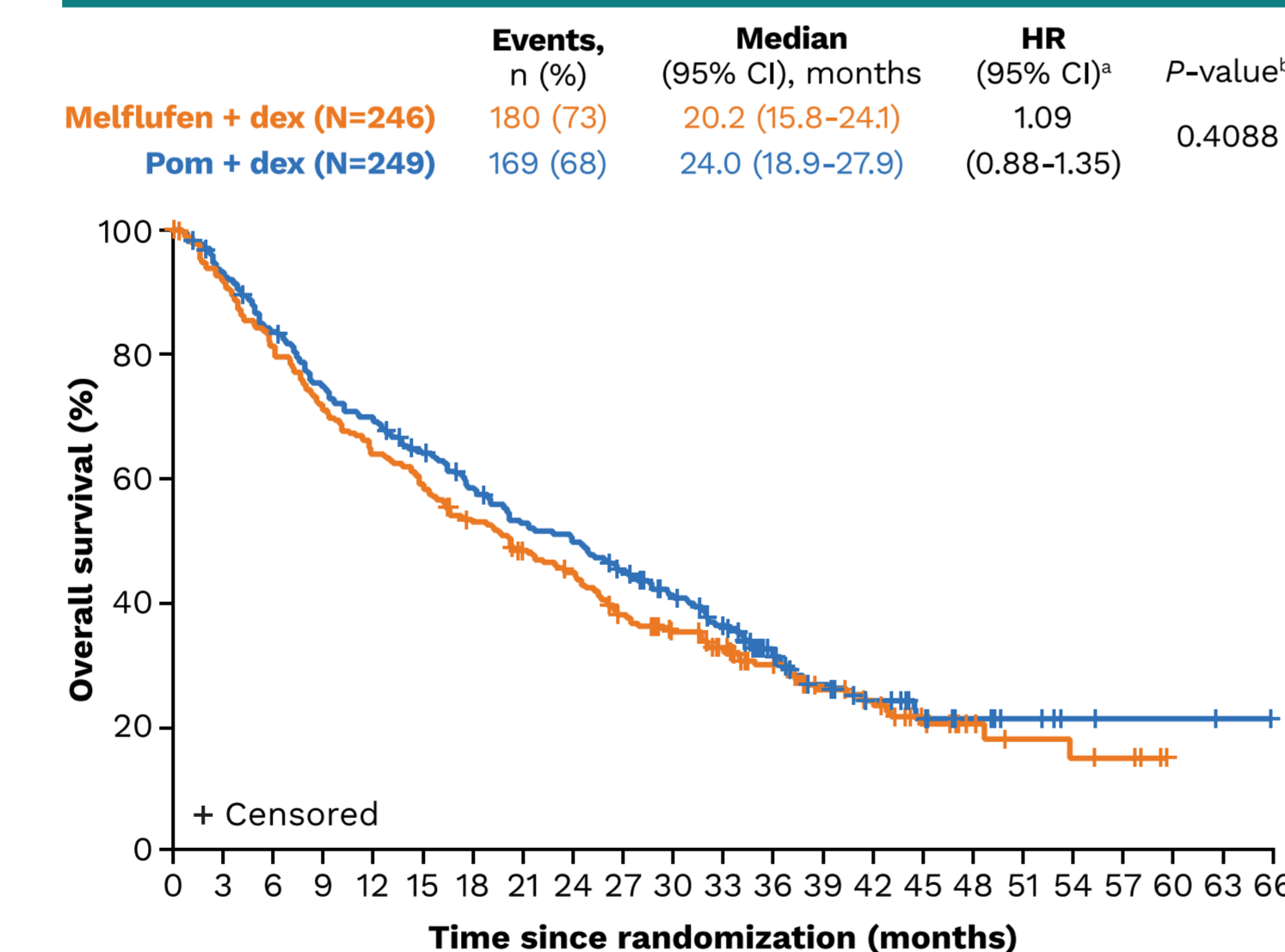
Data cutoff date: February 3, 2023. ^aDefined as t(4;14), t(8;24), t(11;22), del(17p), gain(12p), or gain(1q32) by fluorescence in situ hybridization. EMD, extramedullary disease; ISS, International Staging System; melflufen, melphalan flufenamide; pom, pomalidomide.

EFFICACY

OVERALL SURVIVAL

- ITT population: Median OS in the ITT melflufen and pom populations was 20.2 vs 24.0 months (HR, 1.09 [95% CI, 0.88-1.35]), at a median follow-up of 40.3 and 38.1 months, respectively (Figure 2)
 - Target population: Median OS in patients without a prior ASCT or TTP >36 months after an ASCT was 23.6 vs 19.1 months (HR, 0.88 [95% CI, 0.67-1.16]) in the melflufen and pom groups, respectively (Figure 3A)
 - Non-target population: Median OS in patients with TTP <36 months after ASCT was 15.7 vs 27.5 months (HR, 1.60 [95% CI, 1.15-2.21]) in the melflufen and pom groups, respectively (Figure 3B)

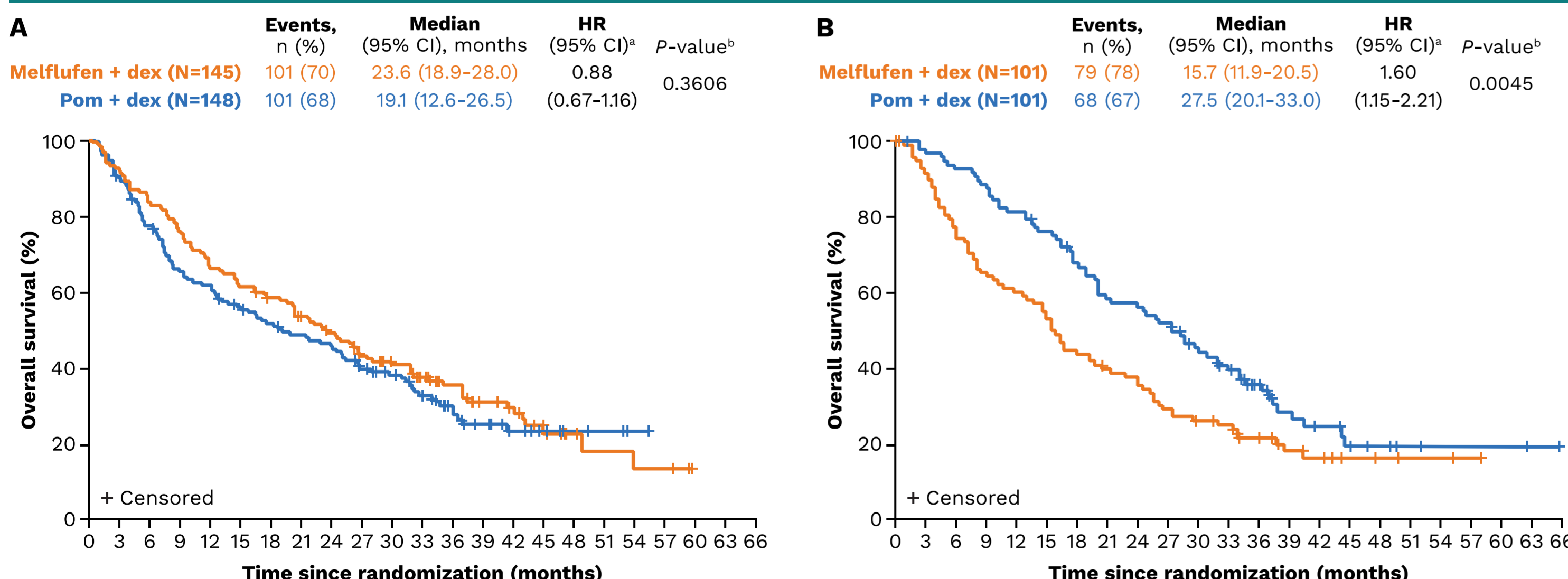
Figure 2. OS in the ITT Population



Patients at risk

Time since randomization (months)	0	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	
Melflufen + dex	246	223	197	174	155	143	127	112	103	85	74	63	48	34	28	16	9	6	3	4	0	0	0	0
Pom + dex	249	225	201	179	167	151	135	121	114	101	86	70	46	32	23	14	9	6	3	2	2	1	0	0

Figure 3. OS in Patients (A) Without ASCT or TTP >36 Months After ASCT and (B) With TTP <36 Months After ASCT

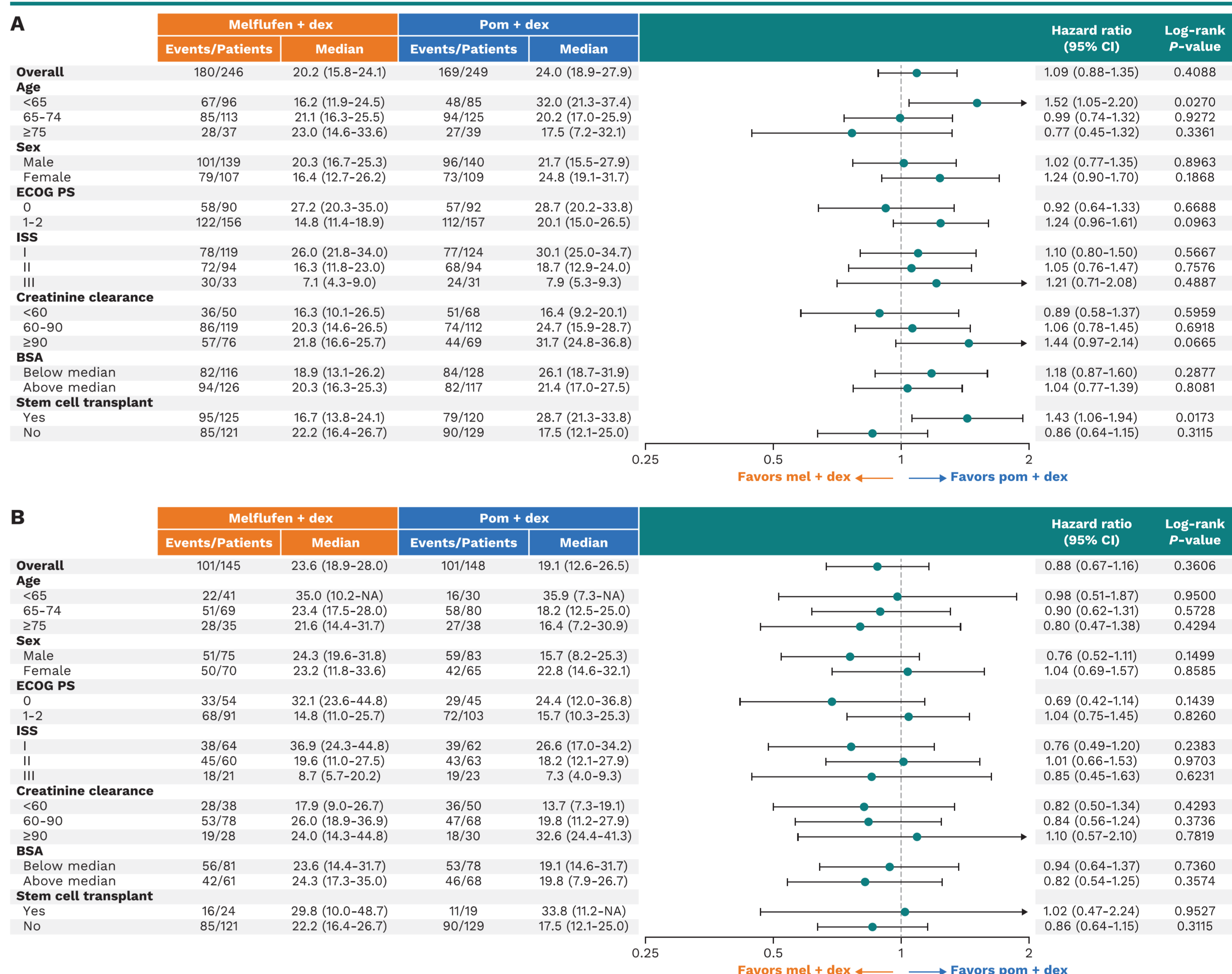


Data cutoff date: February 3, 2023. ^aHR and associated 95% CI and P-value are calculated using a Cox proportional hazards regression model. ^bUnstratified log-rank test. ASCT, autologous stem cell transplant; dex, dexamethasone; HR, hazard ratio; OS, overall survival; pom, pomalidomide; TTP, time to progression.

RESULTS

Although OS in the ITT population was higher for most subgroups in the pom arm, with notable exception for patients >75 years and patients without a previous ASCT (Figure 4A), it was generally in favor of melflufen when compared with pom in the target population (Figure 4B)

Figure 4. OS by Subgroup in (A) the ITT Population and (B) in Patients Without ASCT or TTP >36 Months After ASCT



SAFETY

- The median treatment duration was 25.2 weeks (range, 41-2571) in the melflufen arm and 22.1 weeks (range, 11-285.6) in the pom arm
- Hematologic treatment-emergent adverse events (TEAEs) were more common with melflufen + dex; occurrence of non-hematologic TEAEs was similar in the 2 arms (Suppl Table 1)
 - Grade 3/4 TEAEs were experienced by 90% of patients in the melflufen arm and 76% of patients in the pom arm (Table 2)
 - Grade 3/4 hematologic toxicity was more common in the melflufen arm, whereas Grade 3/4 infection and infestations were more common in the pom arm
 - Thrombocytopenia (78% vs 13%; occurring with Grade 3/4 hemorrhage in 1% vs 0%)
 - Neutropenia (64% vs 50%; occurring with Grade 3/4 infections in 4% vs 7%)
 - Anemia (43% vs 19%)
 - Infection and infestations (14% vs 24%)
- In the melflufen and pom arms, serious TEAEs occurred in 43% and 50% of patients, respectively (Table 2)
- Fatal TEAEs were similar in the melflufen and pom arms (14% vs 15%) (Table 2)

Table 2. Most Common Grade 3/4, Serious AEs, Fatal AEs, and SPM

Adverse event, n (%)	Safety Analysis Set		Target Population	
	Melflufen + Dex (n=228)	Pom + Dex (n=246)	Melflufen + Dex (n=137)	Pom + Dex (n=147)
Grade 3/4 AEs	204 (90)	187 (76)	122 (89)	108 (73)
Thrombocytopenia ^a	177 (78)	32 (13)	99 (72)	18 (12)
Concomitant with Grade 3/4 bleeding ^b	2 (1)	0 (0)	2 (2)	0 (0)
Neutropenia ^a	147 (64)	122 (50)	91 (66)	75 (51)
Concomitant with Grade 3/4 infection	8 (4)	16 (7)	4 (3)	9 (6)
Infection	31 (14)	58 (24)	21 (15)	36 (24)
Anemia ^a	99 (43)	46 (19)	58 (42)	28 (19)
Serious AEs^a	99 (43)	124 (50)	63 (46)	75 (51)
Pneumonia	14 (6)	23 (9)	8 (6)	14 (10)
COVID-19 pneumonia	12 (5)	14 (6)	8 (6)	10 (7)
Anemia	8 (4)	6 (2)	5 (4)	6 (4)
Thrombocytopenia	11 (5)	3 (1)	6 (4)	1 (1)
Atrial fibrillation	1 (0.4)	9 (4)	0 (0)	5 (3)
Fatal AEs^a	32 (14)	37 (15)	19 (14)	27 (18)
COVID-19 pneumonia	8 (4)	5 (2)	4 (3)	4 (3)
Pneumonia	4 (2)	4 (2)	2 (1)	4 (3)
Multiple organ dysfunction syndrome	2 (1)	2 (1)	1 (1)	2 (1)
Cardiac arrest	2 (1)	2 (1)	2 (1)	2 (1)
Renal failure	2 (1)	2 (1)	0 (0)	1 (1)
Second primary malignancy	5 (2)	5 (2)	3 (2)	4 (3)

Data cutoff date: February 3, 2023. ^aEvents of special interest represent grouped terms, or Standardized MedDRA Queries (SMQ). For thrombocytopenia, the preferred terms from hematopoietic thrombocytopenia (SMQ) were combined. ^bBleeding + hemorrhage. For neutropenia, the preferred terms from neutropenia, febrile neutropenia, neutrophil count decreased, neutropenic sepsis, neutropenic infection, cyclic neutropenia, band neutrophil count decreased, band neutrophil percentage decreased, the neutrophil percentage decreased, agranulocytosis, granulocyte count decreased, and granulocytopenia were combined. For anemia, the preferred terms under hematopoietic syndromes (SMQ) were combined. For hemorrhages, the preferred terms from hemorrhage terms (excluding laboratory terms; SMQ) and hemorrhage laboratory terms (SMQ) narrow were combined. For SPM, the preferred terms from the high-level term myelodysplastic syndromes or any term in malignant or unspecified tumors (SMQ) but will exclude high-level group term plasma cell neoplasm were combined. ^cSerious AEs presented are those occurring in ≥2% (10 patients) of the total safety population. ^dFatal AEs presented are those occurring in 4 or more patients. AE, adverse event; dex, dexamethasone; pom, pomalidomide; SPM, second primary malignancy.

- TEAEs led to dose reductions in 52% of melflufen-treated vs 28% of pom-treated patients, most frequently due to thrombocytopenia (32% vs 2%) and neutropenia (12% vs 8%) (Suppl Table 2)
- TEAEs led to permanent discontinuation in 30% of melflufen-treated vs 24% of pom-treated patients (Suppl Table 2)
- TEAEs led to dose delays in 68% of patients receiving melflufen vs 51% of patients receiving pom (Suppl Table 2)
- In the safety population, deaths occurred in 74% vs 68% of patients in the melflufen and pom arms (Suppl Table 3)
 - AEs were the primary cause of death ≤30 days after last dose in 8% and 11% of patients, respectively, followed by progressive disease (3% in each arm)

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