

Pelabresib in combination with ruxolitinib for Janus kinase inhibitor treatment-naïve patients with myelofibrosis: results of the MANIFEST-2 randomized, double-blind, Phase 3 study

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Oral 628

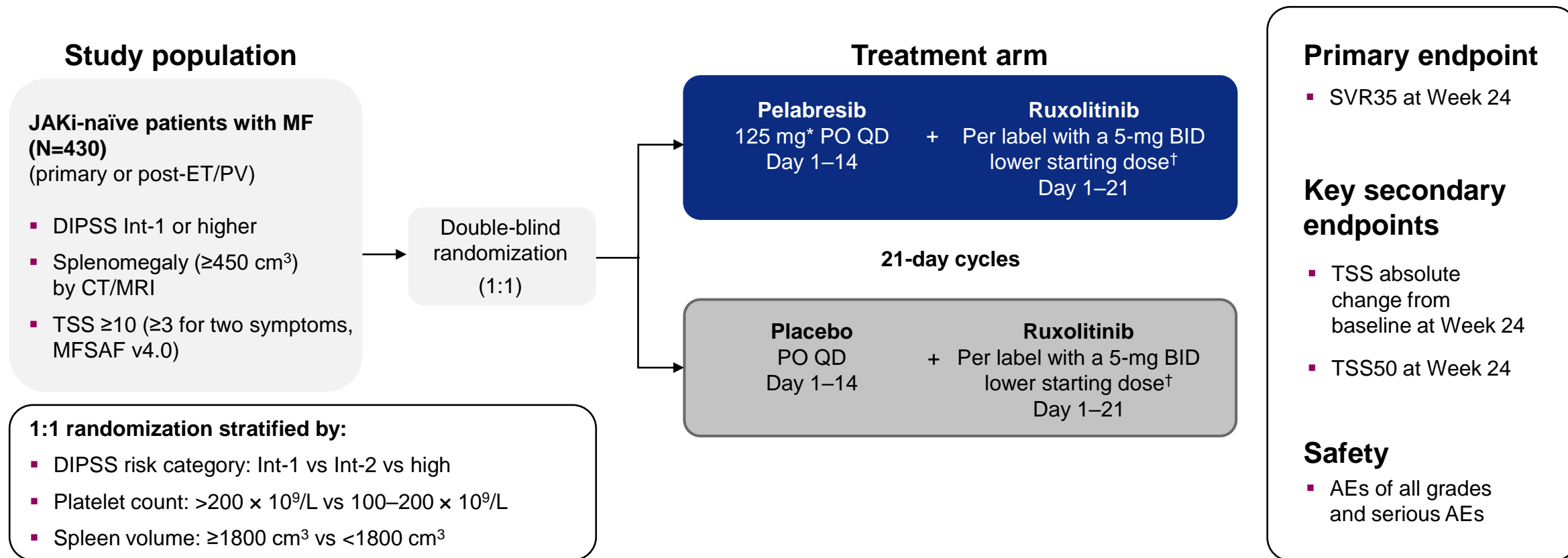
Pelabresib clinical development in myelofibrosis

- Myelofibrosis (MF) is a debilitating and progressive disease, characterized by four hallmarks: bone marrow fibrosis, cytopenias (e.g., anemia), MF-associated symptoms, and splenomegaly¹
 - Reduction of spleen size is associated with improved overall survival²
- MF results from the dysregulation of the JAK/STAT pathway and BET-mediated gene modulation³
- JAK inhibition is the standard of care in intermediate- and high-risk MF⁴
- Unmet medical need persists due to the limited depth and durability of response and treatment-emergent adverse events^{1,5}
- Pelabresib (CPI-0610) is an investigational, oral, small-molecule drug designed to inhibit BET proteins and decrease BET-mediated gene expression involved in MF pathogenesis^{6,7}

The objective of the MANIFEST-2 study is to assess the efficacy and safety of the combination of pelabresib + ruxolitinib in JAKi-naïve patients with MF

BET, bromodomain and extraterminal domain; JAK, Janus kinase; JAKi, Janus kinase inhibitor; MF, myelofibrosis; STAT, signal transducer and activator of transcription. 1. Tefferi A. *Am J Hematol*. 2021;96(1):145-162; 2. Bewersdorf J, et al. *Hemasphere*. 2023;7(S3):1965-66; 3. Kleppe M, et al. *Cancer Cell*. 2018;33(1):29-43.e7; 4. Bose P, Verstovsek S. *Hemasphere*. 2020;4(4):e424; 5. Harrison CN, et al. *Future Oncol*. 2022;18(27):2987-2997; 6. Albrecht BK, et al. *J Med Chem*. 2016;59(4):1330-1339; 7. Mascarenhas J, et al. *J Clin Oncol*. 2023;41(32):4993-5004.

Global, randomized, double-blind, active-control, Phase 3 study



AE, adverse event; BID, twice daily; CT, computed tomography; DIPSS, Dynamic International Prognostic Scoring System; ET, essential thrombocythemia; Int, intermediate; JAKi, Janus kinase inhibitor; MF, myelofibrosis; MFSAF, Myelofibrosis Symptom Assessment Form; MRI, magnetic resonance imaging; PO, orally; PV, polycythemia vera; QD, once daily; SVR35, $\geq 35\%$ reduction in spleen volume; TSS, total symptom score; TSS50, $\geq 50\%$ reduction in total symptom score. *The starting dose for pelabresib was 125 mg QD and protocol-defined dose modifications based on AEs and treatment response allowed a dose range between 50 mg and 175 mg QD; †Ruxolitinib was started at 10 mg BID (baseline platelet count $100\text{--}200 \times 10^9/\text{L}$) or 15 mg BID (baseline platelet count $>200 \times 10^9/\text{L}$) with a mandatory dose increase by 5 mg BID after one cycle and a maximum dose of 25 mg BID per label. Harrison CN, et al. *Future Oncol*. 2022;18(27):2987-29977.

Patient disposition

	Pelabresib + ruxolitinib	Placebo + ruxolitinib
Randomized	214 (100%)	216 (100%)
Treated	212 (99.1%)	214 (99.1%)
Discontinued double-blind treatment	58 (27.1%)	54 (25.0%)
Adverse event	23 (10.7%)	14 (6.5%)
Physician decision (including lack of benefit)	9 (4.2%)	20 (9.3%)
Disease progression	5 (2.3%)	5 (2.3%)
Eligible for transplant	8 (3.7%)	9 (4.2%)
Other*	13 (6.0%)	6 (2.8%)
Ongoing on double-blind treatment	154 (72.0%)	160 (74.1%)

	Pelabresib + ruxolitinib	Placebo + ruxolitinib
Mean daily dose for pelabresib (14 days per 21-day cycle)	108 mg	N/A
Mean daily dose for ruxolitinib (daily)	29.3 mg	31.3 mg
Median follow-up on study (weeks)	45.4	

Data cut off: August 31, 2023. N/A, not applicable. *Other: non-compliance, withdrawal of consent. The study opened for enrollment in November 2020; the first patient received their initial treatment on April 22, 2021, and the last patient received their first treatment on March 2, 2023. Percentages reported are based on the number of patients randomized (intent-to-treat set).

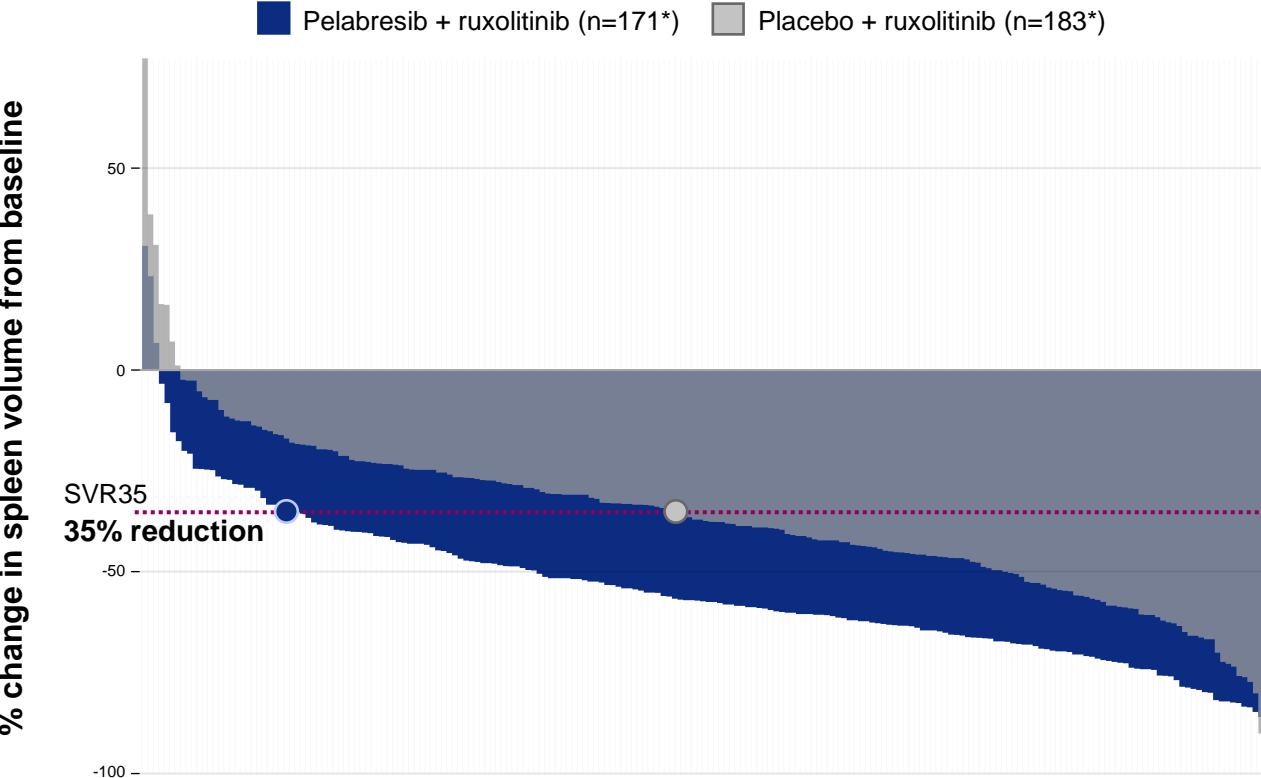
Baseline disease characteristics

Characteristic		Pelabresib + ruxolitinib (N=214)	Placebo + ruxolitinib (N=216)
Age — years	Median (min, max)	66 (19, 84)	66 (26, 88)
Sex — n (%)	Female / male	85 (39.7) / 129 (60.3)	94 (43.5) / 122 (56.5)
Race — n (%)	White / Asian / Black	160 (74.8) / 35 (16.4) / 2 (0.9)	163 (75.5) / 42 (19.4) / 0
	American Indian or Alaska Native	1 (0.5)	0
	Not reported / Unknown	15 (7.0) / 1 (0.5)	11 (5.1) / 0
Myelofibrosis subtype — n (%)	Primary myelofibrosis	107 (50)	110 (50.9)
	Post-polycythemia vera myelofibrosis	45 (21)	53 (24.5)
	Post-essential thrombocytopenia myelofibrosis	62 (29)	53 (24.5)
Dynamic International Prognostic Scoring System — n (%)	Intermediate-1	128 (59.8)	127 (58.8)
	Intermediate-2	75 (35)	74 (34.3)
	High-risk	11 (5.1)	15 (6.9)
Mutations — n (%)*	JAK2 V617F	125 (67.2)	122 (64.6)
	CALR	45 (24.2)	50 (26.5)
	MPL	11 (5.9)	13 (6.9)
	Triple negative	8 (4.3)	5 (2.6)
	High-molecular risk mutations	72 (38.7)	88 (46.6)
	Missing	28 (13.1)	27 (12.5)
Hemoglobin — g/dL	Median (range)	10.9 (5.8–18.0)	11.0 (6.7–17.9)
	≤10 — n (%)	70 (32.7)	76 (35.2)
Platelets — × 10 ⁹ /L	Median (min, max)	285 (99, 1303)	287 (66, 1084)
	>200 × 10 ⁹ /L — n (%)	154 (72)	157 (72.7)
Peripheral blasts	Mean (SD)	0.8 (1.18) [†]	0.8 (1.25) [‡]
RBC transfusions — patient n (%)	Requiring RBC transfusion at baseline	35 (16)	25 (12)
ECOG performance status — n (%)	0	107 (50)	109 (50.5)
	1	97 (45.3)	95 (44.0)
	≥2	10 (4.7)	10 (4.6)
	Missing	0	2 (0.9)
Spleen volume (central read) [§]	Median spleen volume (range) — cc	1308.89 (200.24–7117.03)	1382.97 (277.87–5540.45)
Total symptom score [¶]	Median total symptom score (range)	26.6 (7.3–66.4)	24.7 (9.0–68.4)

Data cut off: August 31, 2023. CALR, calreticulin; ECOG, Eastern Cooperative Oncology Group; JAK, Janus kinase; max, maximum; min, minimum; MPL, MPL proto-oncogene, thrombopoietin receptor; RBC red blood cell; SD, standard deviation. *Results do not originate from a validated programming environment. [†]n=208. [‡]n=207. [§]Randomization of patients was based on local read. [¶]Patients with baseline TSS values of <10 have at least 2 individual symptoms score ≥ 3 at baseline.

MANIFEST-2 study achieved its primary endpoint: SVR35 at Week 24

Significantly greater response in patients treated with pelabresib + ruxolitinib vs placebo + ruxolitinib



ITT population

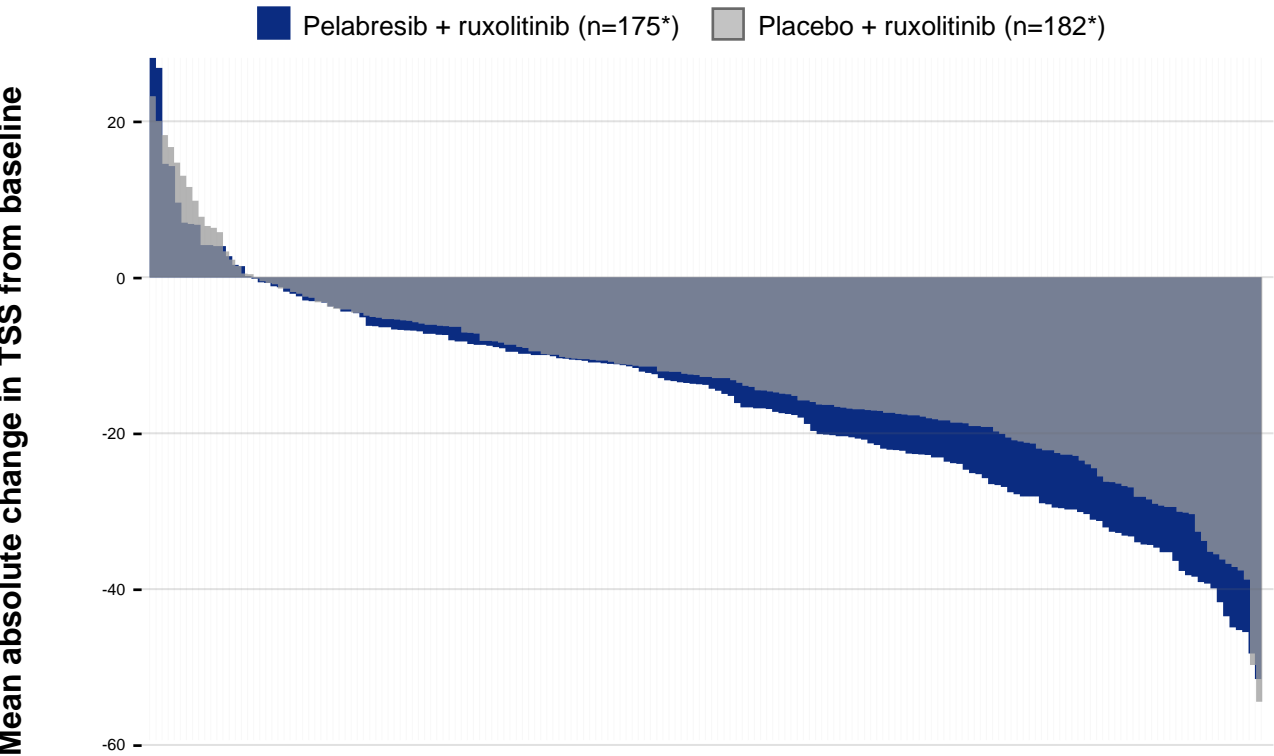
	Pelabresib + ruxolitinib (N=214)	Placebo + ruxolitinib (N=216)	p-value
SVR35 at Week 24	65.9%	35.2%	
Difference† (95% CI)	30.4 (21.6, 39.3)		<0.001

Mean % change in spleen volume at Week 24‡	-50.6 (n=171)	-30.6 (n=183)	
95% CI	-53.2, -48	-33.7, -27.5	

Data cut off: August 31, 2023. CI, confidence interval; ITT, intent-to-treat; SVR35, ≥35% reduction in spleen volume. Spleen volume assessed by central read. *Waterfall plots represent patients who have baseline and Week 24 data. †Calculated by stratified Cochran–Mantel–Haenszel test; ‡Patients without Week 24 assessment are considered non-responders.

Absolute TSS at Week 24

Strong numerical improvements for patients treated with pelabresib + ruxolitinib vs placebo + ruxolitinib



ITT population

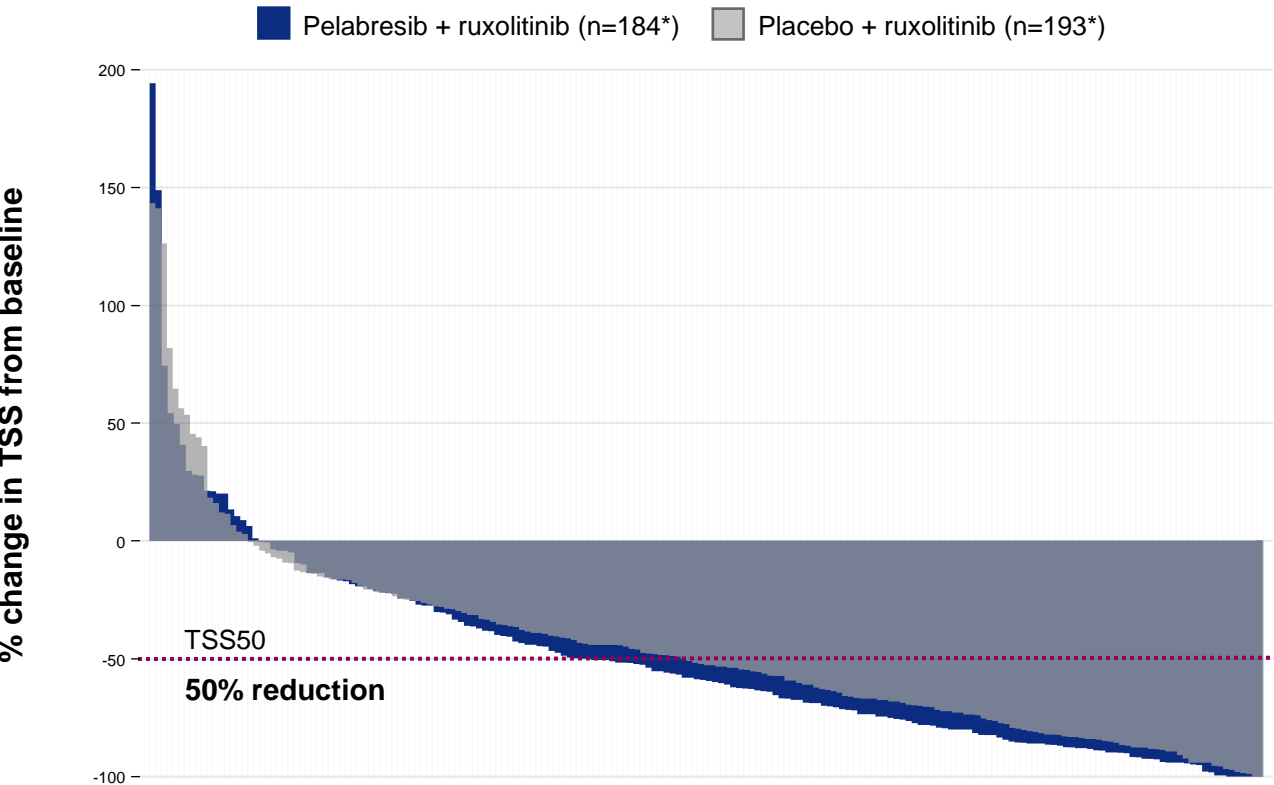
	Pelabresib + ruxolitinib (N=214)	Placebo + ruxolitinib (N=216)	p-value
TSS change [†] from baseline at Week 24	-15.99	-14.05	
Mean difference [‡] (95% CI)	-1.94 (-3.92, 0.04)		0.0545

- **Absolute change in TSS is a continuous endpoint** that estimates magnitude of symptom burden reduction with enhanced precision

Data cut off: August 31, 2023. ANCOVA, analysis of covariance; CI, confidence interval; ITT, intent-to-treat; TSS, total symptom score. *Waterfall plots represent patients who have baseline and Week 24 data. [†]Change from baseline determined by ANCOVA model using Multiple Imputation. [‡]Least square mean difference from ANCOVA model using baseline DIPSS, baseline platelet count and baseline spleen volume as factors, and baseline TSS as covariate.

TSS50 response at Week 24

Numerically greater in patients treated with pelabresib + ruxolitinib vs placebo + ruxolitinib



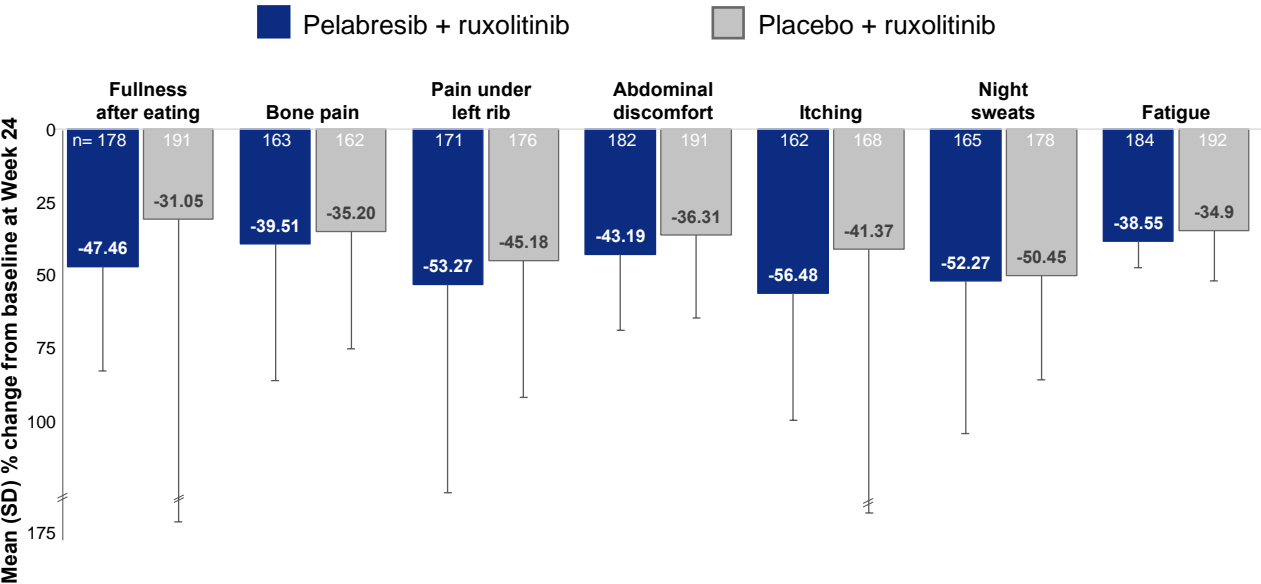
ITT population

	Pelabresib + ruxolitinib (N=214)	Placebo + ruxolitinib (N=216)	p-value
TSS50 at Week 24	52.3%	46.3%	
Difference [†] (95% CI)	6.0 (-3.5, 15.5)		0.216

Data cut off: August 31, 2023. CI, confidence interval; ITT, intent-to-treat; TSS, total symptom score; TSS50, ≥50% reduction in total symptom score. Patients are evaluable for TSS50 at Week 24 if they have had Week 24 TSS assessment by the data cutoff date or discontinued without Week 24 assessment at any time. *Waterfall plots represent patients who have baseline and Week 24 data. †Difference in treatment groups analyzed by stratified Cochran–Mantel–Haenszel test (weighted 95% CI adjusted across strata).

TSS domains at Week 24

Numerically greater in patients treated with pelabresib + ruxolitinib vs placebo + ruxolitinib with benefit balanced across all TSS domains



ITT population

	Pelabresib + ruxolitinib (N=214)	Placebo + ruxolitinib (N=216)	p-value
TSS50 at Week 24	52.3%	46.3%	
Difference [†] (95% CI)	6.0 (-3.5, 15.5)		0.216

Data cut off: August 31, 2023. CI, confidence interval; ITT, intent-to-treat; TSS, total symptom score; TSS50, ≥50% reduction in total symptom score. Patients are evaluable for TSS50 at Week 24 if they have had Week 24 TSS assessment by the data cutoff date or discontinued without Week 24 assessment at any time. [†]Difference in treatment groups analyzed by stratified Cochran–Mantel–Haenszel test (weighted 95% CI adjusted across strata).

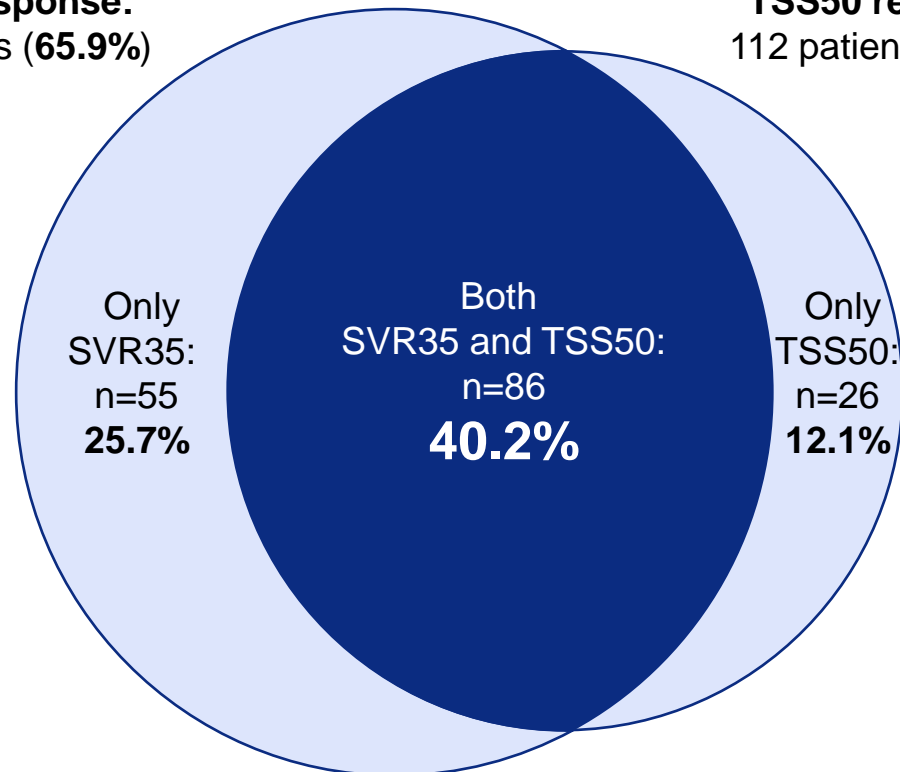
Dual SVR35 / TSS50 responders at Week 24

Two-fold increase in patients achieving both SVR35 and TSS50 with pelabresib + ruxolitinib vs placebo + ruxolitinib

Pelabresib + ruxolitinib (N=214)

SVR35 response:
141 patients (65.9%)

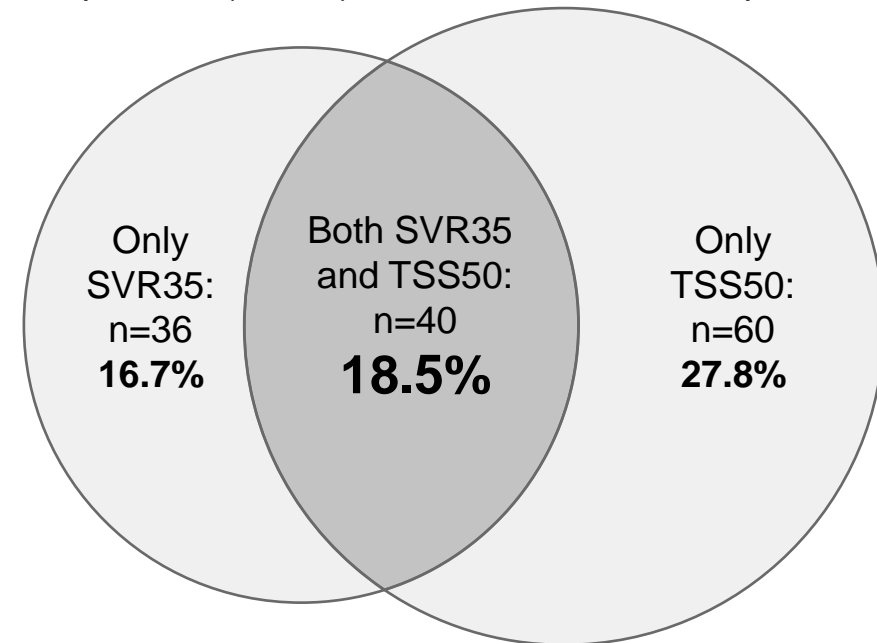
TSS50 response:
112 patients (52.3%)



Placebo + ruxolitinib (N=216)

SVR35 response:
76 patients (35.2%)

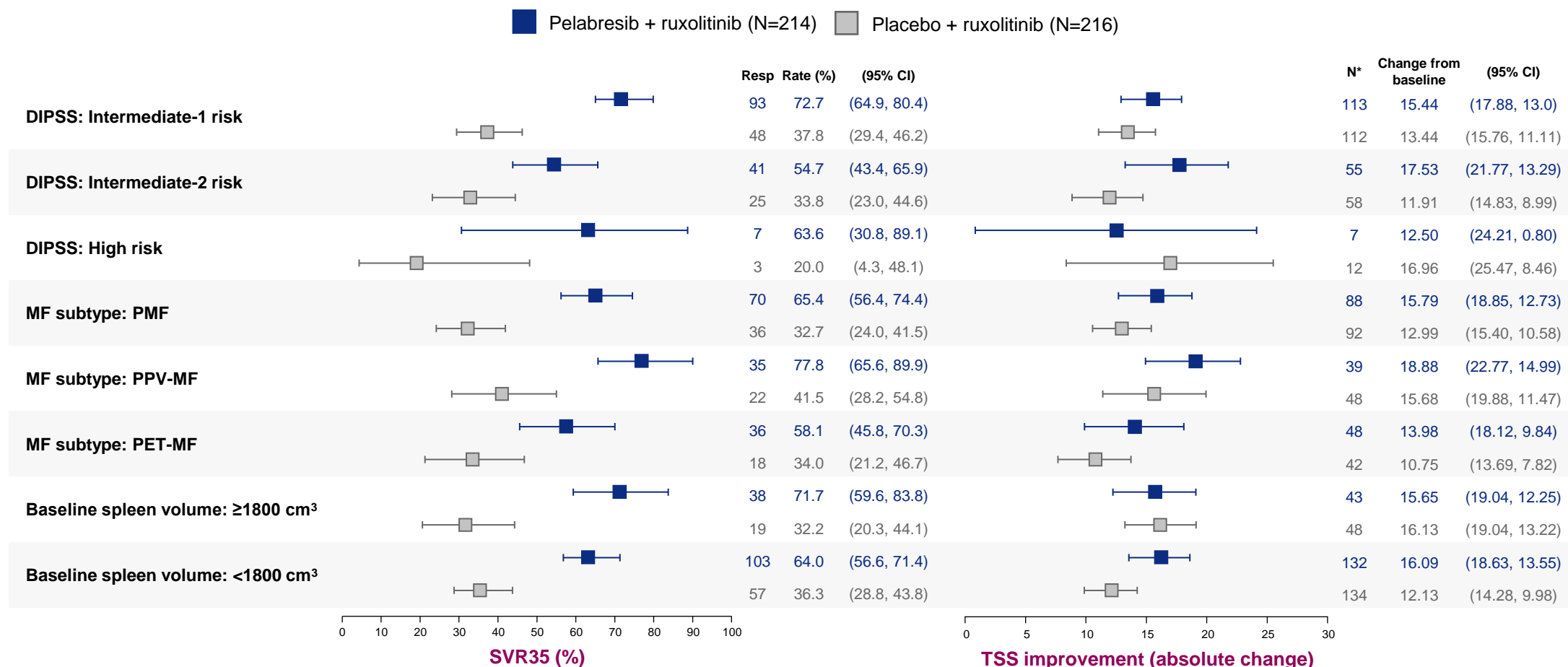
TSS50 response:
100 patients (46.3%)



Data cut off: August 31, 2023. N, number of patients; SVR35, $\geq 35\%$ reduction in spleen volume; TSS50, $\geq 50\%$ reduction in total symptom score. Diagrams are not drawn to scale.

Prespecified subgroup analyses at Week 24

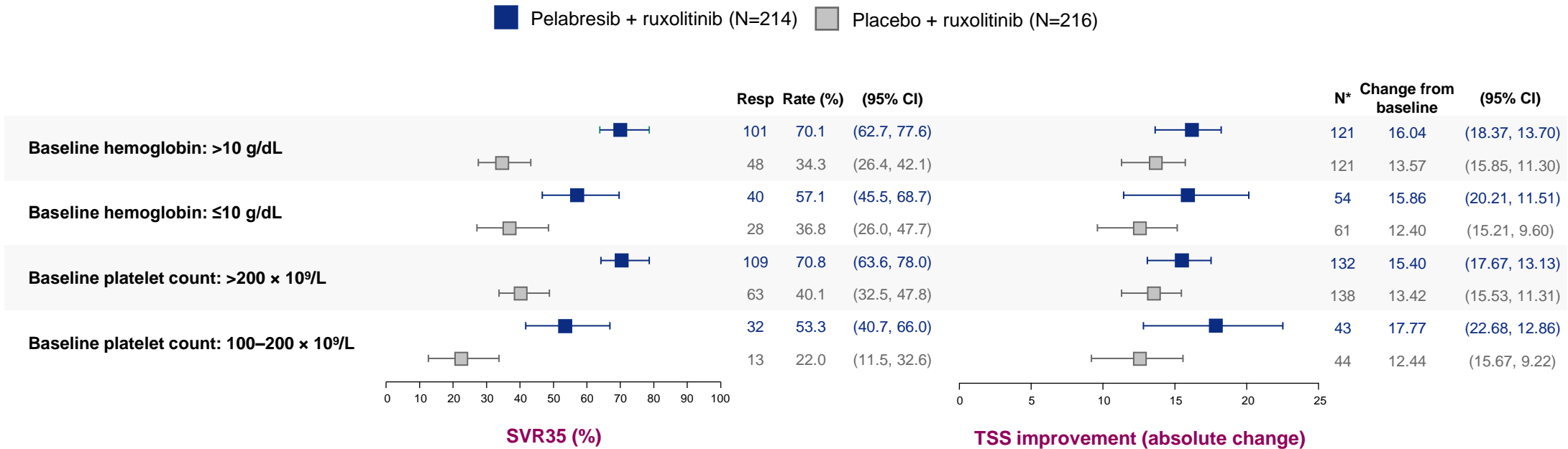
SVR35 response consistently higher in pelabresib + ruxolitinib vs placebo + ruxolitinib across all predefined subgroups



Data cut off: August 31, 2023. CI, confidence interval; DIPSS, Dynamic International Prognostic Scoring System; MF, myelofibrosis; PET-MF, post-essential thrombocythemia myelofibrosis; PMF, primary myelofibrosis; PPV-MF, post-polycythemia vera myelofibrosis; Resp, number of responders; SVR35, ≥35% reduction in spleen volume; TSS, total symptom score. *Number of patients with Week 24 observations.

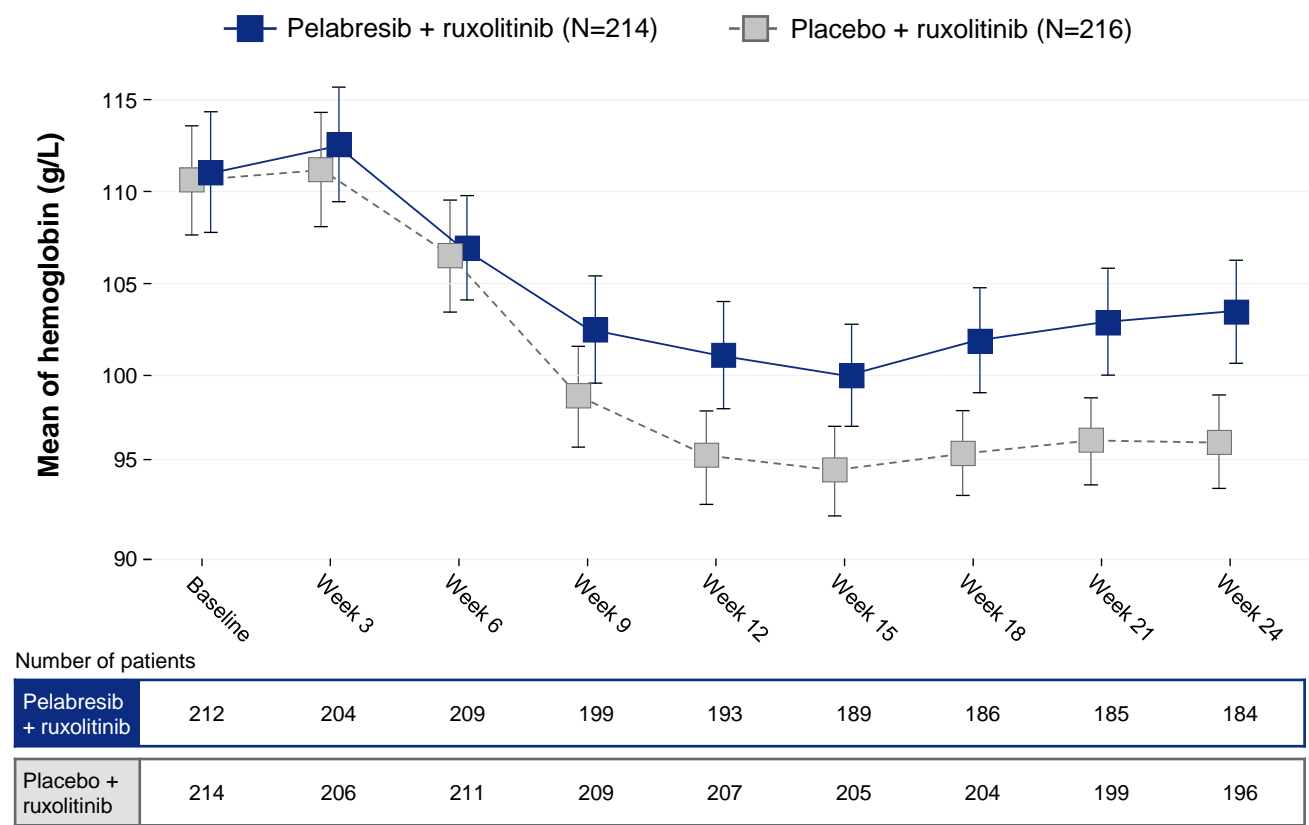
Prespecified hematologic subgroup analyses at Week 24

SVR35 response consistently higher in pelabresib + ruxolitinib combination vs placebo + ruxolitinib across hematologic subgroups



Hemoglobin response

A numerically greater proportion of patients achieved hemoglobin response with pelabresib + ruxolitinib vs placebo + ruxolitinib



ITT population

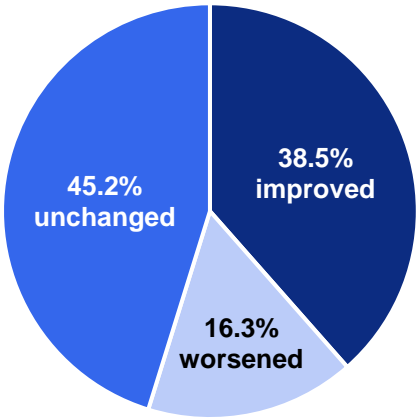
	Pelabresib + ruxolitinib (N=214)	Placebo + ruxolitinib (N=216)
Hemoglobin response* ≥ 1.5 g/dL mean increase (95% CI)	9.3% (5.45, 13.25)	5.6% (2.50, 8.61)
Patients requiring RBC transfusion during screening, n (%)	35 (16.4)	25 (11.6)
Patients requiring RBC transfusion during first 24 weeks of study treatment, n (%)	66 (30.8)	89 (41.2)

Preliminary Analyses from Data cut off: August 31, 2023. CI, confidence interval; RBC, red blood cell. *Hemoglobin response is defined as a ≥ 1.5 g/dL mean increase in hemoglobin from baseline in the absence of transfusions during the previous 12 weeks. Baseline hemoglobin defined as the last assessment prior to or on Cycle 1 Day 1, regardless of blood transfusions. A similar effect was observed across DIPSS categories.

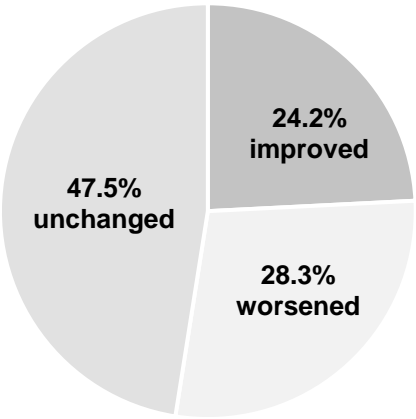
Reduction in bone marrow fibrosis and inflammatory cytokines

Improvement of reticulin fibrosis grade in central read by Week 24

Pelabresib + ruxolitinib (n=104*)



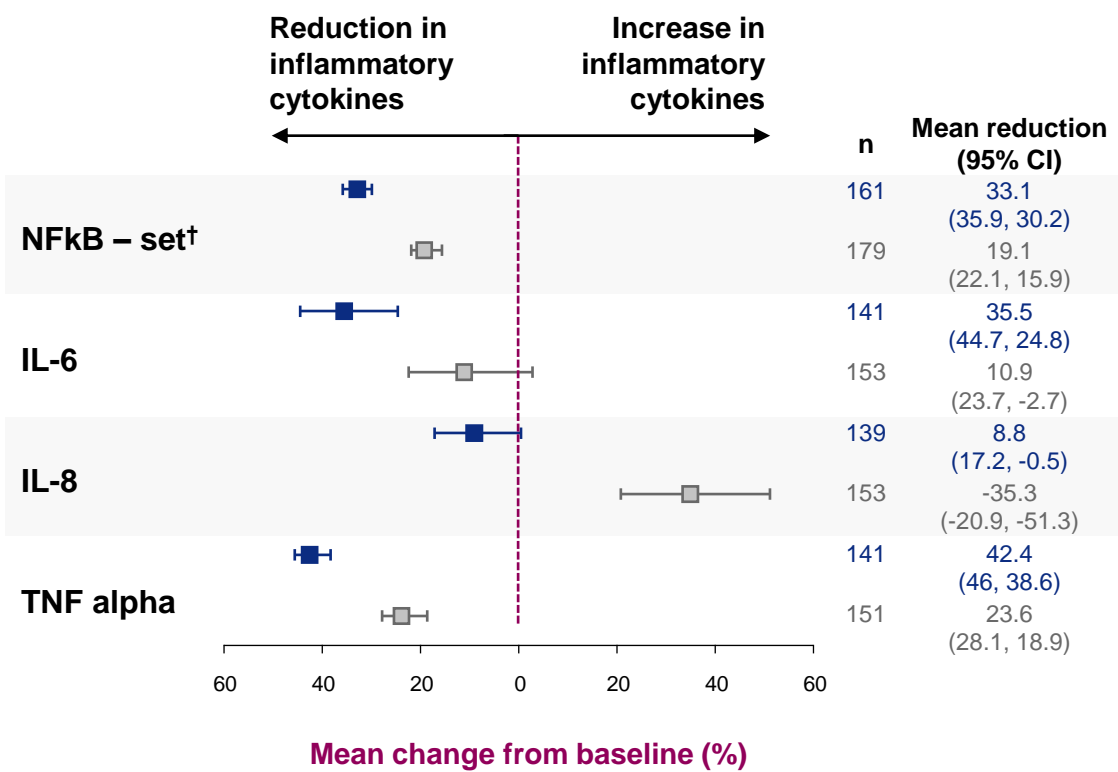
Placebo + ruxolitinib (n=99*)



	Pelabresib + ruxolitinib	Placebo + ruxolitinib	Odds ratio
Worsened ≥1 grade (%)	16.3	28.3	0.47 (0.23-0.92)
Improved ≥1 grade (%)	38.5	24.2	2.09 (1.14-3.93)

Reduction of inflammatory cytokines by Week 24

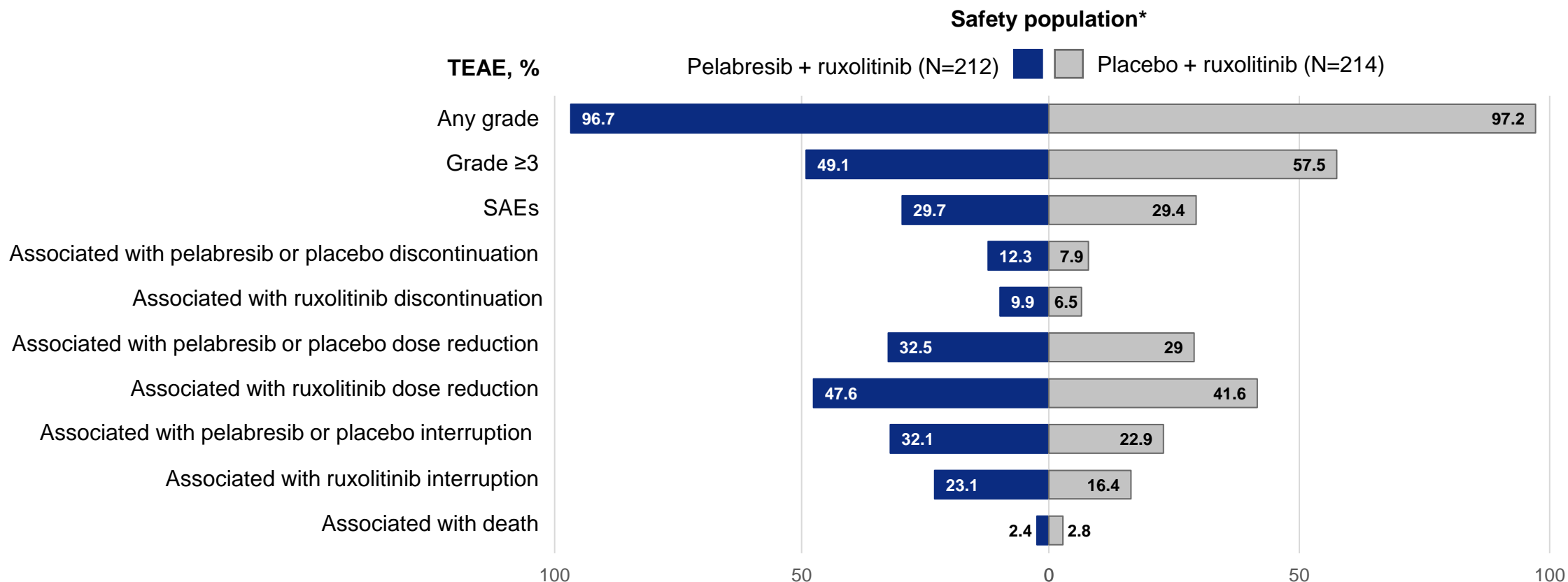
■ Pelabresib + ruxolitinib (N=214) □ Placebo + ruxolitinib (N=216)



Preliminary Analyses from Data cut off: August 31, 2023. IL-6, interleukin 6; IL-8, interleukin 8; NFκB, Nuclear factor kappa-light-chain-enhancer of activated B cells; TNF, tumor necrosis factor. *n=203 evaluable patients (baseline & C9D1). †NFκB - set includes: B2M, CRP, CD40-L, HEPCIDIN, IL-6, IL-12p40, MIP-1 BETA, MPIF-1, RANTES, TNFR2, TNF alpha, VCAM-1.

Summary of safety

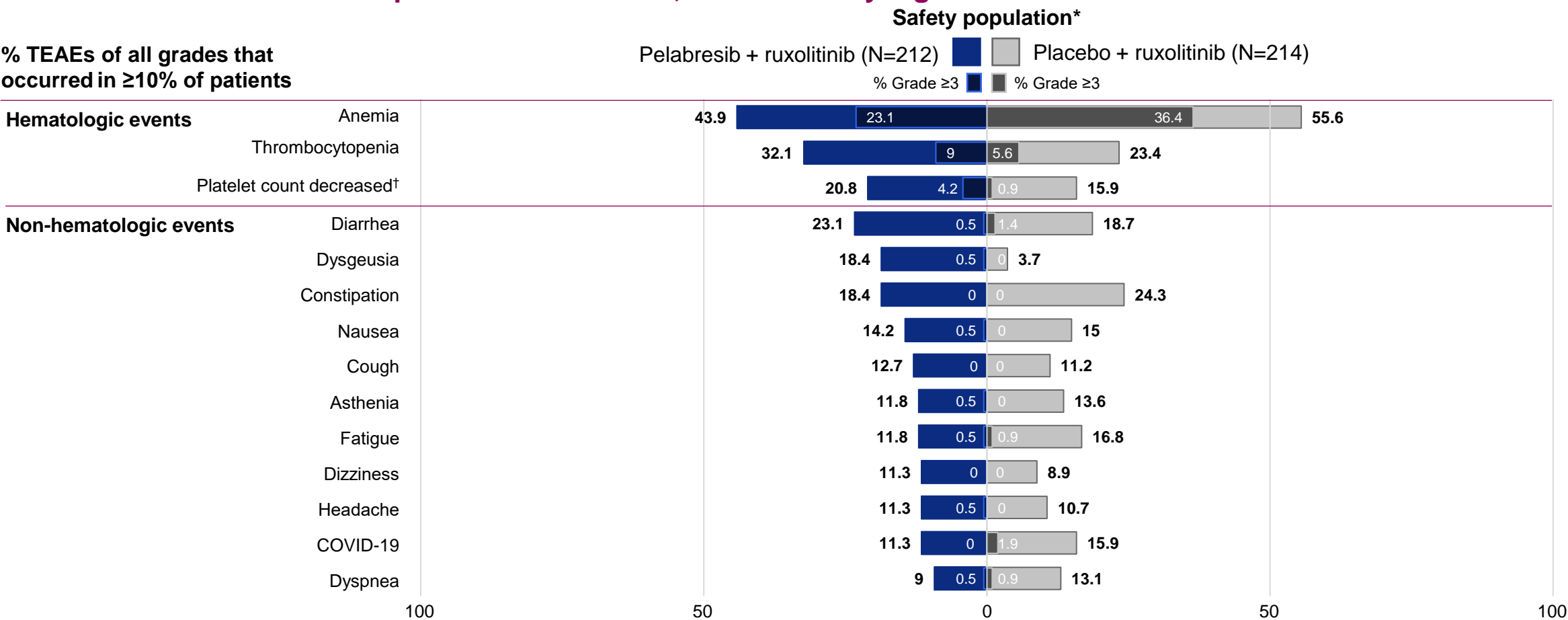
The safety profile of the pelabresib + ruxolitinib combination was consistent with prior trials



Preliminary Analyses from Data cut off: August 31, 2023. TEAE, treatment-emergent adverse event; SAE, serious adverse event. *Safety population: received at least one dose of study drug. TEAEs are regardless of relationship to study drug. A TEAE for the double-blinded treatment period is defined as an adverse event that has a start date on or after the first dose of the pelabresib/placebo and before 30 days after the last dose of pelabresib/placebo or before the start of alternative (off-study) treatment for MF, whichever occurs first. MF, myelofibrosis.

Treatment-emergent adverse events

Adverse events of anemia were reported less frequently with pelabresib + ruxolitinib combination than with placebo + ruxolitinib; no new safety signals were observed



Preliminary Analyses from Data cut off: August 31, 2023. TEAE, treatment-emergent adverse event. *Safety population: received at least one dose of study drug. †Platelet count decreased was classified under the system organ class of investigation. TEAEs are regardless of relationship to study drug. A TEAE for the double-blinded treatment period is defined as an adverse event that has a start date on or after the first dose of the pelabresib/placebo and before 30 days after the last dose of pelabresib/placebo or before the start of alternative (off-study) treatment for MF, whichever occurs first. MF, myelofibrosis; COVID-19, coronavirus disease 2019.

Conclusions

- **Pelabresib in combination with ruxolitinib compared with placebo in combination with ruxolitinib in JAK inhibitor treatment-naïve patients at Week 24:**
 - Significantly reduced splenomegaly (SVR35: 66% vs 35%; $p < 0.001$)
 - Demonstrated strong trends in reducing the mean absolute TSS ($p = 0.0545$) and improving TSS50 response
 - Doubled the percentage of patients with dual SVR35 / TSS50 response
- **Fewer anemia adverse events, higher rates of hemoglobin responses and fewer patients with transfusion requirement**
- **The safety profile appeared generally comparable to the established safety profile of ruxolitinib with fewer grade ≥ 3 events**
- **Pelabresib in combination with ruxolitinib showed reduction of pro-inflammatory cytokines, and improvement in bone marrow fibrosis and anemia response, addressing the four hallmarks of myelofibrosis**

These results support a potential paradigm shift in the treatment of patients with myelofibrosis

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