

Overall survival with KISQALI + AI in 1L postmenopausal patients with HR+/HER2- mBC

Hortobagyi GN, Stemmer SM, Burris HA, et al. Overall survival with ribociclib plus letrozole in advanced breast cancer. *N Engl J Med.* 2022;386(10):942-950.

“*The MONALEESA-2 trial provides evidence of a significant improvement in overall survival with a nonsteroidal aromatase inhibitor plus a CDK4/6 inhibitor in postmenopausal women, as well as impressive median survival to date (63.9 months) among women with HR-positive, HER2-negative advanced breast cancer.*”

— Hortobagyi GN, et al

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MONALEESA-2: At a median follow-up of 80 months, median OS was 63.9 months with KISQALI[®] (ribociclib) + letrozole (95% CI: 52.4-71.0) vs 51.4 months with letrozole (95% CI: 47.2-59.7); HR=0.76 (95% CI: 0.63-0.93); *P*=0.008. In the primary analysis at a median follow-up of 15 months, mPFS was not reached (95% CI: 19.3-NR) vs 14.7 months (95% CI: 13.0-16.5); HR=0.556 (95% CI: 0.429-0.720); *P*<0.0001.

Indications

KISQALI[®] (ribociclib) is indicated for the treatment of adult patients with hormone receptor (HR)-positive, human epidermal growth factor receptor 2 (HER2)-negative advanced or metastatic breast cancer in combination with:

- an aromatase inhibitor as initial endocrine-based therapy; or
- fulvestrant as initial endocrine-based therapy or following disease progression on endocrine therapy in postmenopausal women or in men.

IMPORTANT SAFETY INFORMATION

Interstitial lung disease/pneumonitis. Severe, life-threatening, or fatal interstitial lung disease (ILD) and/or pneumonitis can occur in patients treated with KISQALI and other CDK4/6 inhibitors.

Across clinical trials in patients with advanced or metastatic breast cancer treated with KISQALI in combination with an aromatase inhibitor or fulvestrant (“KISQALI treatment groups”), 1.1% of KISQALI-treated patients had ILD/pneumonitis of any grade, 0.3% had grade 3 or 4, and 0.1% had a fatal outcome. Additional cases of ILD/pneumonitis have been observed in the postmarketing setting, with fatalities reported.

1L=first line; AI=aromatase inhibitor; CDK=cyclin-dependent kinase; HR=hazard ratio; mBC=metastatic breast cancer; mPFS=median progression-free survival; NR=not reached; OS=overall survival.

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 **KISQALI[®]**
ribociclib 200 mg tablets



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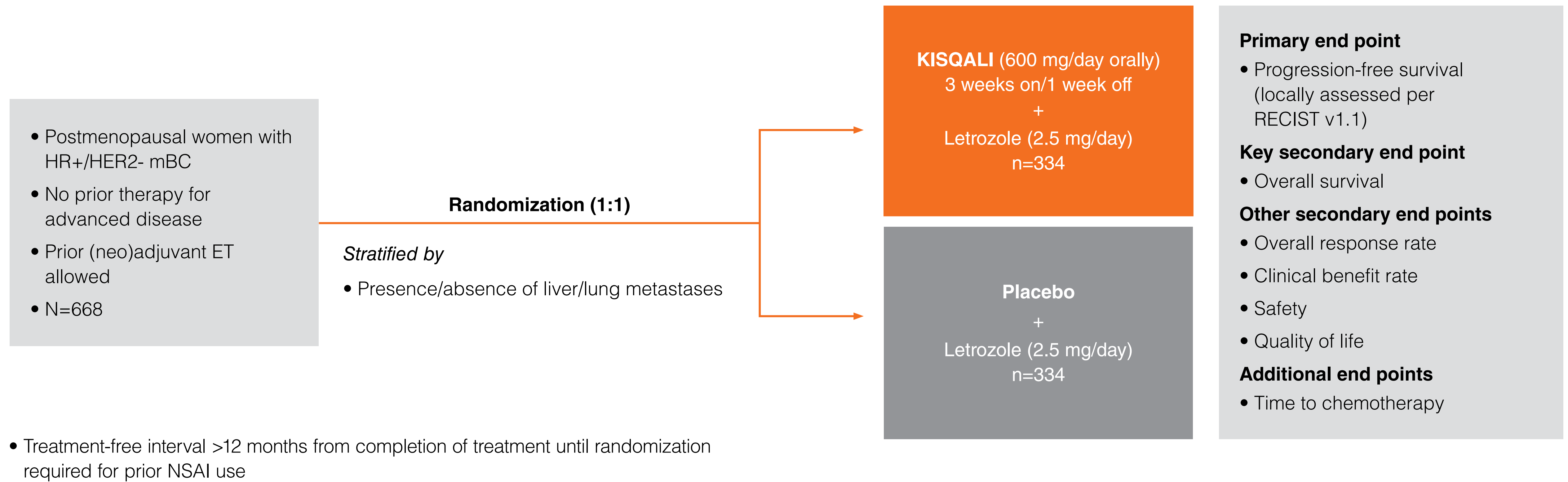
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CONCLUSION



Trial design

MONALEESA-2 was a randomized, double-blind, placebo-controlled, phase III study that assessed the efficacy and safety of KISQALI + letrozole as a first-line treatment for postmenopausal patients with HR+/HER2- mBC^{1,2}




IMPORTANT SAFETY INFORMATION (continued)

Interstitial lung disease/pneumonitis (continued). Monitor patients for pulmonary symptoms indicative of ILD/pneumonitis, which may include hypoxia, cough, and dyspnea. In patients who have new or worsening respiratory symptoms suspected to be due to ILD or pneumonitis, interrupt treatment with KISQALI immediately and evaluate the patient. Permanently discontinue treatment with KISQALI in patients with recurrent symptomatic or severe ILD/pneumonitis.

ET=endocrine therapy; NSAI=nonsteroidal aromatase inhibitor; RECIST=response evaluation criteria in solid tumors.

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Results from key studies of CDK4/6 inhibitors + AIs assessing overall survival in 1L postmenopausal patients with HR+/HER2- mBC

	MONALEESA-2 ¹	PALOMA-2 ^{3,4}	MONARCH-3 ⁵
Enrollment period	Jan 2014 to Mar 2015	Feb 2013 to Jul 2014	Nov 2014 to Nov 2015
Final OS readout	 At a median follow-up of 80 months, statistically significant OS data reported	Pending	Pending

“Significant improvement in overall survival is one of the primary goals in the treatment of advanced breast cancer, in addition to maintaining or improving quality of life.” — Hortobagyi GN, et al

IMPORTANT SAFETY INFORMATION (continued)

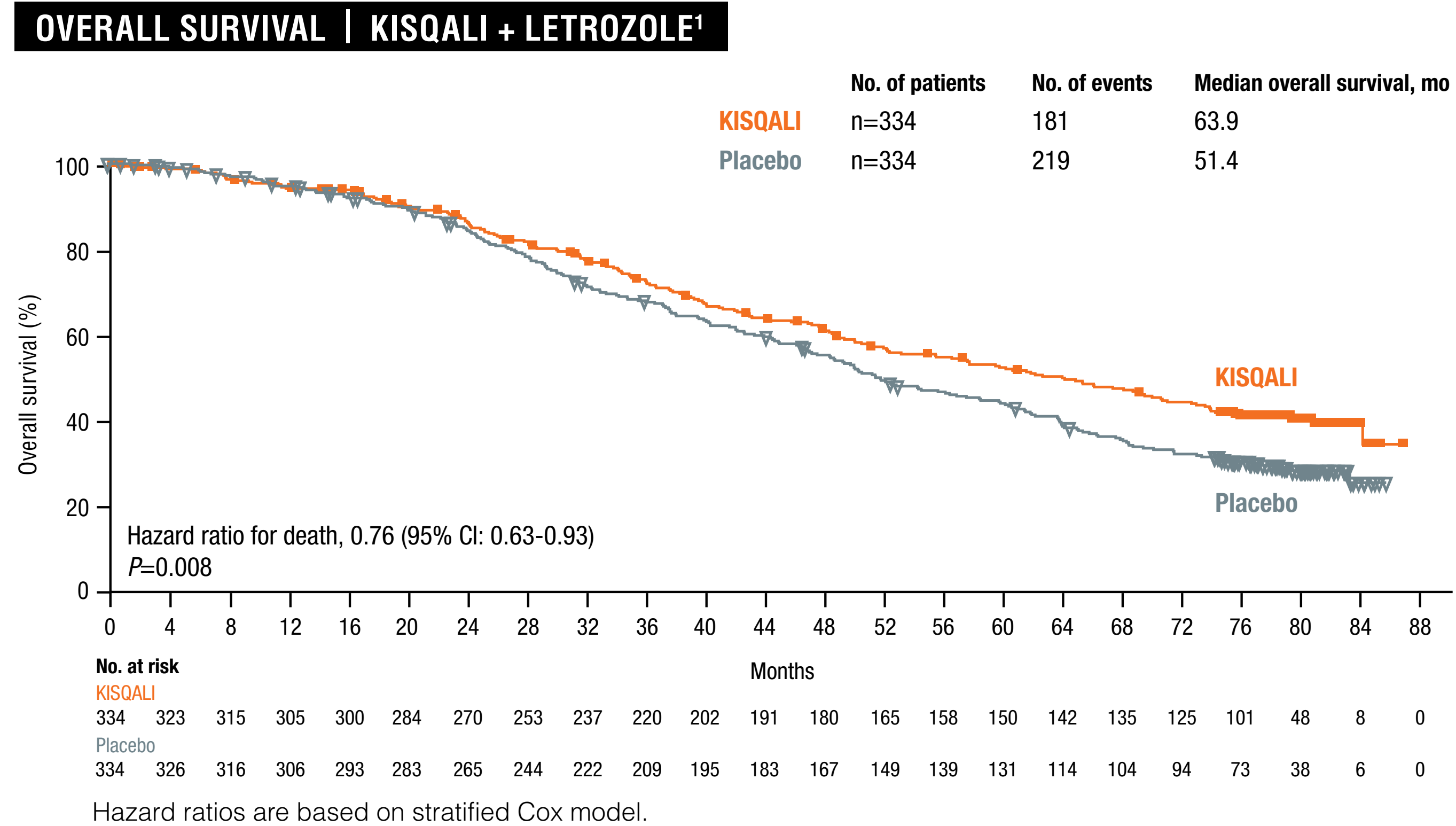
Severe cutaneous adverse reactions. Severe cutaneous adverse reactions (SCARs), including Stevens-Johnson syndrome (SJS), toxic epidermal necrolysis (TEN), and drug-induced hypersensitivity syndrome (DiHS)/drug reaction with eosinophilia and systemic symptoms (DRESS) have been reported in patients treated with KISQALI in the postmarketing setting.

If signs or symptoms of SCARs occur, interrupt KISQALI until the etiology of the reaction has been determined. Consultation with a dermatologist is recommended.

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Overall survival with KISQALI + letrozole in 1L postmenopausal patients

At a median follow-up of 80 months



63.9 MONTHS mOS WITH KISQALI + LETROZOLE (95% CI: 52.4-71.0)¹

>1-YEAR INCREASE IN mOS

“The MONALEESA-2 trial provides...impressive median survival to date (63.9 months) among women with HR-positive, HER2-negative advanced breast cancer.” — Hortobagyi GN, et al

PFS: In the primary analysis at a median follow-up of 15 months, mPFS was not reached with KISQALI[®] (ribociclib) + letrozole (95% CI: 19.3-NR) vs 14.7 months with placebo + letrozole (95% CI: 13.0-16.5); HR=0.556 (95% CI: 0.429-0.720); P<0.0001. In an updated analysis, mPFS was 25.3 months with KISQALI + letrozole vs 16.0 months with placebo + letrozole (HR=0.568 [95% CI: 0.457-0.704]); P<0.0001.^{2,6,7}

IMPORTANT SAFETY INFORMATION (continued)

Severe cutaneous adverse reactions (continued). If SCARs is confirmed, permanently discontinue KISQALI. Do not reintroduce KISQALI in patients who have experienced SCARs or other life-threatening cutaneous reactions during KISQALI treatment.

QT interval prolongation. KISQALI has been shown to prolong the QT interval in a concentration-dependent manner. Based on the observed QT prolongation during treatment, KISQALI may require dose interruption, reduction, or discontinuation. Across KISQALI treatment groups, 14 of 1054 patients (1%) had >500 ms postbaseline QTcF value, and 59 of 1054 (6%) had a >60 ms increase from baseline in QTcF intervals. These ECG changes were reversible with dose interruption and most occurred within the first 4 weeks of treatment. No cases of torsades de pointes were reported. In MONALEESA-2, on the KISQALI + letrozole treatment arm, there was 1 (0.3%) sudden death in a patient with grade 3 hypokalemia and grade 2 QT prolongation. No cases of sudden death were reported in MONALEESA-7 or MONALEESA-3.

mOS=median overall survival; PFS=progression-free survival.

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Landmark survival estimates

	4-YEAR OS ¹	5-YEAR OS ¹	6-YEAR OS ¹
KISQALI + letrozole n=334	60.9% (95% CI: 55.2%-66.1%)	52.3% (95% CI: 46.5%-57.7%)	44.2% (95% CI: 38.5%-49.8%)
Placebo + letrozole n=334	55.2% (95% CI: 49.5%-60.5%)	43.9% (95% CI: 38.3%-49.4%)	32.0% (95% CI: 26.8%-37.3%)
Landmark survival difference	5.7%	8.4%	12.2%

**6-YEAR SURVIVAL LANDMARKS
DIFFERED BY 12%
WITH KISQALI + LETROZOLE VS
PLACEBO + LETROZOLE¹**

“The Kaplan-Meier analysis shows that the overall survival benefit of ribociclib began to emerge at approximately 20 months and continued to increase with longer follow-up, as indicated by survival at 5 years and 6 years.” — Hortobagyi GN, et al

For overall survival Kaplan-Meier curve, see previous page.

- Statistically significant improvement in overall survival in the ITT population; $P=0.008$ (HR=0.76 [95% CI: 0.63-0.93])¹

IMPORTANT SAFETY INFORMATION (continued)

QT interval prolongation (continued). Assess ECG prior to initiation of treatment. Initiate treatment with KISQALI only in patients with QTcF values <450 ms. Repeat ECG at approximately Day 14 of the first cycle, at the beginning of the second cycle, and as clinically indicated. Monitor serum electrolytes (including potassium, calcium, phosphorus, and magnesium) prior to the initiation of treatment, at the beginning of each of the first 6 cycles, and as clinically indicated. Correct any abnormality before starting therapy with KISQALI.

ITT=intent to treat.

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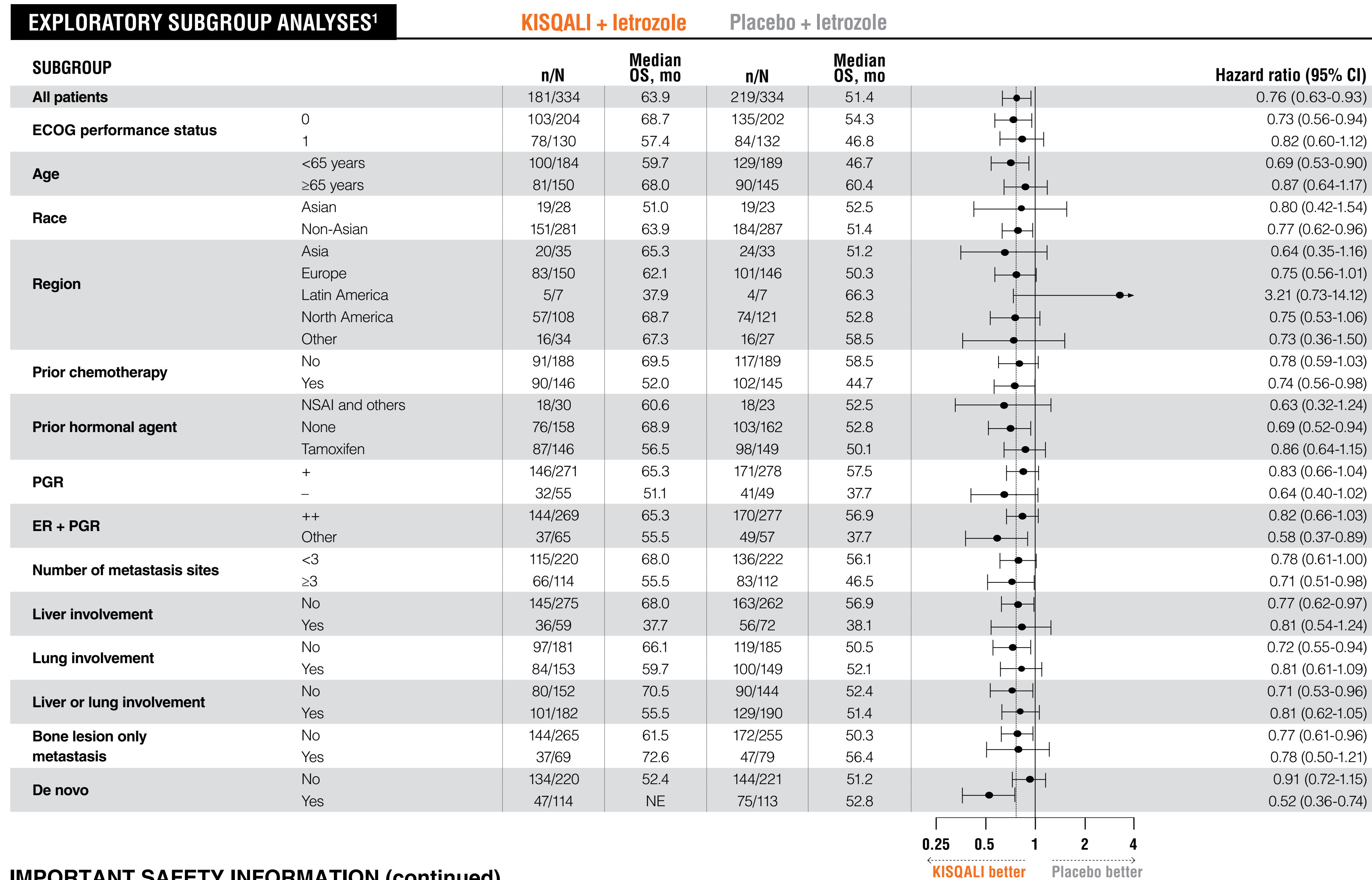
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Overall survival benefit across subgroups consistent with results in the overall population



- Randomization was stratified by the presence or absence of liver or lung metastases¹

IMPORTANT SAFETY INFORMATION (continued)

QT interval prolongation (continued). Avoid the use of KISQALI in patients who already have or who are at significant risk of developing QT prolongation, including patients with:

- long QT syndrome
- uncontrolled or significant cardiac disease including recent myocardial infarction, congestive heart failure, unstable angina, and bradyarrhythmias
- electrolyte abnormalities

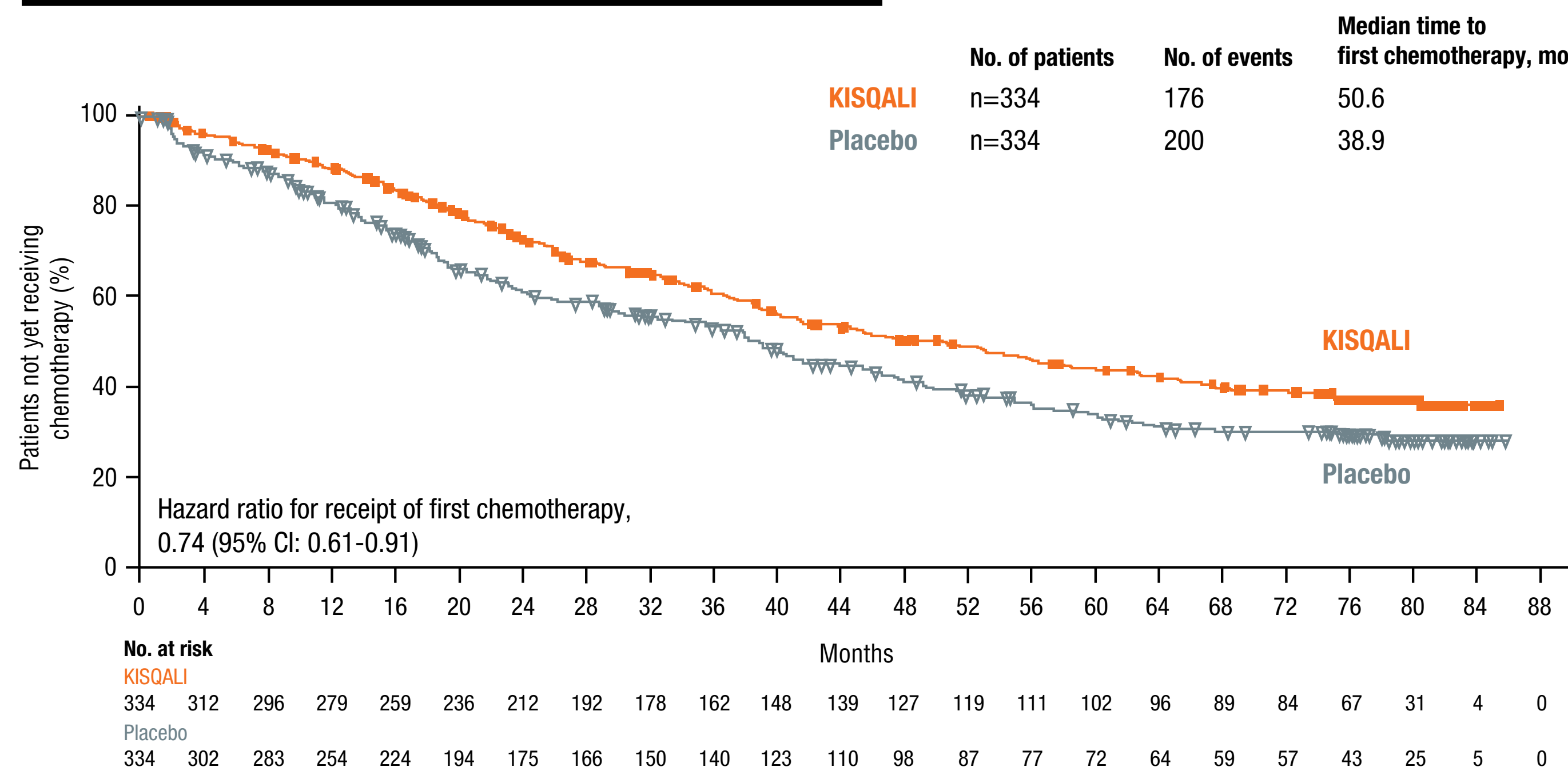
ECOG=Eastern Cooperative Oncology Group; ER=estrogen receptor; NE=not estimable; PGR=progesterone receptor.

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Median time to chemotherapy delayed over 4 years

At a median follow-up of 80 months

TIME TO CHEMOTHERAPY | KISQALI + LETROZOLE⁸



50.6 MONTHS mTTC WITH KISQALI + LETROZOLE¹

- Time to chemotherapy was an exploratory end point and was defined as the time from randomization to the beginning of the first chemotherapy after discontinuing study treatment⁹
- There was no prespecified statistical procedure controlling for type 1 error

IMPORTANT SAFETY INFORMATION (continued)

QT interval prolongation (continued). Avoid using KISQALI with drugs known to prolong the QT interval and/or strong CYP3A inhibitors, as this may lead to prolongation of the QTcF interval.

Increased QT prolongation with concomitant use of tamoxifen. KISQALI is not indicated for concomitant use with tamoxifen. In MONALEESA-7, the observed mean QTcF increase from baseline was ≥ 10 ms higher in the tamoxifen + placebo subgroup compared with the NSAID + placebo subgroup. In the placebo arm, an increase of >60 ms from baseline occurred in 6/90 (7%) of patients receiving tamoxifen, and in no patients receiving an NSAID. An increase of >60 ms from baseline in the QTcF interval was observed in 14/87 (16%) of patients in the KISQALI and tamoxifen combination and in 18/245 (7%) of patients receiving KISQALI plus an NSAID.

Hepatobiliary toxicity. Across clinical trials in patients with advanced or metastatic breast cancer, increases in transaminases were observed. Across all trials, grade 3 or 4 increases in alanine aminotransferase (ALT) (10% vs 2%) and aspartate aminotransferase (AST) (7% vs 2%) were reported in the KISQALI and placebo arms, respectively.

mTTC=median time to chemotherapy.

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Patient disposition

	KISQALI + letrozole ⁸ (n=334)	Placebo + letrozole ⁸ (n=334)	All patients ⁸ (N=668)
Patients treated—no. (%)			
Treatment ongoing	30 (9.0)	17 (5.1)	47 (7.0)
Ended treatment	304 (91.0)	313 (93.7)	617 (92.4)
Reason for end of treatment—no. (%)			
Adverse event	37 (11.1)	9 (2.7)	46 (6.9)
Physician decision	25 (7.5)	20 (6.0)	45 (6.7)
Progressive disease	204 (61.1)	263 (78.7)	467 (69.9)
Protocol deviation	3 (0.9)	1 (0.3)	4 (0.6)
Patient/guardian decision	29 (8.7)	23 (6.9)	52 (7.8)
Death	6 (1.8)	1 (0.3)	7 (1.0)

Four patients in the placebo arm did not receive study treatment.
Treatment ongoing refers to patients continuing study treatment at the time of data cutoff (June 10, 2021).

9% OF PATIENTS REMAINED ON TREATMENT AT THE TIME OF DATA CUTOFF, WITH A MEDIAN FOLLOW-UP OF 80 MONTHS^{1,8}

IMPORTANT SAFETY INFORMATION (continued)

Hepatobiliary toxicity (continued). Among the patients who had grade ≥ 3 ALT/AST elevation, the median time to onset was 85 days and median time to resolution to grade ≤ 2 was 22 days for the KISQALI treatment groups.

In MONALEESA-2 and MONALEESA-3, concurrent elevations in ALT or AST greater than 3 times the ULN and total bilirubin greater than 2 times the ULN, with normal alkaline phosphatase, in the absence of cholestasis occurred in 6 (1%) patients and all patients recovered after discontinuation of KISQALI. No cases occurred in MONALEESA-7.

Perform liver function tests (LFTs) before initiating therapy with KISQALI. Monitor LFTs every 2 weeks for the first 2 cycles, at the beginning of each of the subsequent 4 cycles, and as clinically indicated. Based on the severity of the transaminase elevations, KISQALI may require dose interruption, reduction, or discontinuation. Recommendations for patients who have elevated AST/ALT grade ≥ 3 at baseline have not been established.

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Subsequent therapies

	KISQALI + letrozole ⁸ (n=334)	Placebo + letrozole ⁸ (n=334)
No. of patients who discontinued study treatment—n (%)	304 (91.0)	317 (94.9)
Chemotherapy		
Pyrimidine analogues	129 (42.4)	155 (48.9)
Taxanes	100 (32.9)	128 (40.4)
Platinum compounds	30 (9.9)	24 (7.6)
Anthracyclines	55 (18.1)	69 (21.8)
Endocrine therapy		
Aromatase inhibitors	138 (45.4)	138 (43.5)
Exemestane	96 (31.6)	96 (30.3)
Letrozole	64 (21.1)	49 (15.5)
Anastrozole	5 (1.6)	10 (3.2)
Antiestrogens	156 (51.3)	193 (60.9)
Fulvestrant	145 (47.7)	175 (55.2)
Tamoxifen	27 (8.9)	41 (12.9)
Kinase inhibitors		
Everolimus	90 (29.6)	90 (28.4)
Palbociclib	49 (16.1)	100 (31.5)
Ribociclib	14 (4.6)	6 (1.9)
Abemaciclib	8 (2.6)	12 (3.8)
Other		
Alpelisib	11 (3.6)	4 (1.3)

Percentages reported are based on the number of patients who discontinued study treatment. A patient with multiple occurrences is only counted once in the total row.

IMPORTANT SAFETY INFORMATION (continued)

Neutropenia. Across trials, neutropenia was the most frequently reported adverse reaction (AR) (74%), and a grade 3/4 decrease in neutrophil count (based on laboratory findings) was reported in 58% of patients in the KISQALI treatment groups. Among the patients who had grade 2, 3, or 4 neutropenia, the median time to grade ≥ 2 was 16 days. The median time to resolution of grade ≥ 3 (to normalization or grade < 3) was 12 days in the KISQALI treatment groups. Febrile neutropenia was reported in 1% of patients in the KISQALI treatment groups. Treatment discontinuation due to neutropenia was 0.8%.

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“Although subsequent use of CDK4/6 inhibitors in any line of therapy was more frequent in the placebo group than in the ribociclib group (34.4% vs. 21.7%), the ribociclib group had a significant overall survival benefit.”

— Hortobagyi GN, et al

- Statistically significant improvement in overall survival in the ITT population; $P=0.008$ (HR=0.76 [95% CI: 0.63-0.93])¹

Safety summary

The most common adverse event occurring in at least 15% of patients in any group was neutropenia (63.8% for KISQALI® [ribociclib] vs 1.2% for placebo).^{1,8}

Additional key grade 3/4 adverse events of special interest in the KISQALI and placebo arms were¹:

- Hepatobiliary toxic effects (14.4% for KISQALI vs 4.8% for placebo)
- Prolonged QT interval (4.5% for KISQALI vs 2.1% for placebo)
- Grade 3 interstitial lung disease/pneumonitis was observed in 2 patients (0.6%) in the KISQALI group and 0 patients in the placebo group

—There were no grade 4 events or deaths related to interstitial lung disease/pneumonitis in the KISQALI arm

“Adverse-event profiles in both trial groups were consistent with previously reported results...no new safety signals were revealed.” — Hortobagyi GN, et al

IMPORTANT SAFETY INFORMATION (continued)

Neutropenia (continued). Perform complete blood count (CBC) before initiating therapy with KISQALI. Monitor CBC every 2 weeks for the first 2 cycles, at the beginning of each of the subsequent 4 cycles, and as clinically indicated. Based on the severity of the neutropenia, KISQALI may require dose interruption, reduction, or discontinuation.

Embryofetal toxicity. Based on findings from animal studies and the mechanism of action, KISQALI can cause fetal harm when administered to a pregnant woman. In animal reproduction studies, administration of KISQALI to pregnant rats and rabbits during organogenesis caused embryofetal toxicities at maternal exposures that were 0.6 and 1.5 times the human clinical exposure, respectively, based on area under the curve. Advise pregnant women of the potential risk to a fetus. Advise women of reproductive potential to use effective contraception during therapy with KISQALI and for at least 3 weeks after the last dose.

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Unrivaled overall survival data across 3 phase III KISQALI trials

2019:

MONALEESA-7 KISQALI + AI in 1L premenopausal patients

Im S-A, Lu Y-S, Bardia A, et al. Overall survival with ribociclib plus endocrine therapy in breast cancer. *N Engl J Med.* 2019;381(4):307-316.

2020:

MONALEESA-3 KISQALI + fulvestrant in 1L/2L postmenopausal patients

Slamon DJ, Neven P, Chia S, et al. Overall survival with ribociclib plus fulvestrant in advanced breast cancer. *N Engl J Med.* 2020;382(6):514-524.

2022:

MONALEESA-2 KISQALI + AI in 1L postmenopausal patients

Hortobagyi GN, Stemmer SM, Burris HA, et al. Overall survival with ribociclib plus letrozole in advanced breast cancer. *N Engl J Med.* 2022;386(10):942-950.



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IMPORTANT SAFETY INFORMATION (continued)

Adverse reactions. Across clinical trials of patients with advanced or metastatic breast cancer, the most common ARs reported in the KISQALI treatment groups (pooled incidence $\geq 20\%$) were neutropenia (74% vs 5%), nausea (45% vs 27%), infections (41% vs 30%), fatigue (33% vs 30%), diarrhea (30% vs 22%), leukopenia (30% vs 3%), vomiting (27% vs 16%), alopecia (24% vs 12%), headache (24% vs 22%), constipation (24% vs 16%), rash (21% vs 9%), and cough (21% vs 16%). The most common grade 3/4 ARs (reported at a pooled frequency $>5\%$) were neutropenia (59% vs 1%), leukopenia (16% vs 3%), abnormal LFTs (9% vs 2%), and lymphopenia (5% vs 1%).

Laboratory abnormalities. Across clinical trials of patients with advanced or metastatic breast cancer, the most common laboratory abnormalities reported in the KISQALI arm vs placebo arm (all grades, pooled incidence $\geq 20\%$ and $\geq 5\%$ higher than placebo arm) were leukocyte count decrease (94% vs 30%), neutrophil count decrease (93% vs 25%), hemoglobin decrease (66% vs 38%), lymphocyte count decrease (61% vs 26%), AST increase (47% vs 38%), ALT increase (44% vs 36%), creatinine increase (38% vs 13%), and platelet count decrease (31% vs 9%). The most common grade 3/4 laboratory abnormalities (incidence $>5\%$) were neutrophil count decrease (59% vs 2%), leukocyte count decrease (32% vs 1%), lymphocyte count decrease (15% vs 4%), ALT increase (10% vs 2%), and AST increase (7% vs 2%).

2L=second line.

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**KISQALI**[®]
ribociclib 200 mg
tablets

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The only CDK4/6 inhibitor with statistically significant overall survival proven across 3 phase III trials

“Taken together, the MONALEESA trials of ribociclib have shown a consistent overall survival benefit regardless of accompanying endocrine therapy, line of therapy, or menopausal status.” — Hortobagyi GN, et al

MONALEESA-7

KISQALI + AI in 1L premenopausal patients

At a median follow-up of 54 months (exploratory analysis), median OS was 58.7 months with KISQALI® (ribociclib) + NSAI + goserelin (95% CI: 48.5-NR) vs 47.7 months with NSAI + goserelin (95% CI: 41.2-55.4); HR=0.798 (95% CI: 0.615-1.035). At a median follow-up of 35 months, statistical significance was established for overall survival in the ITT population; HR=0.71 (95% CI: 0.54-0.95); $P=0.00973$. In the primary analysis at a median follow-up of 19 months, median PFS was 27.5 months (95% CI: 19.1-NR) vs 13.8 months (95% CI: 12.6-17.4); HR=0.569 (95% CI: 0.436-0.743).^{6,10-12}

MONALEESA-3

KISQALI + fulvestrant in 1L/2L postmenopausal patients

At a median follow-up of 56 months (exploratory analysis), median OS was 53.7 months with KISQALI + fulvestrant (95% CI: 46.9-NR) vs 41.5 months with fulvestrant (95% CI: 37.4-49.0); HR=0.726 (95% CI: 0.588-0.897). At a median follow-up of 39 months, statistical significance was established for overall survival in the ITT population; HR=0.724 (95% CI: 0.568-0.924); $P=0.00455$. In the primary analysis at a median follow-up of 20 months, median PFS was 20.5 months (95% CI: 18.5-23.5) vs 12.8 months (95% CI: 10.9-16.3); HR=0.593 (95% CI: 0.480-0.732); $P<0.0001$.^{6,13-15}

MONALEESA-2

KISQALI + AI in 1L postmenopausal patients

At a median follow-up of 80 months, median OS was 63.9 months with KISQALI + letrozole (95% CI: 52.4-71.0) vs 51.4 months with letrozole (95% CI: 47.2-59.7); HR=0.76 (95% CI: 0.63-0.93); $P=0.008$. In the primary analysis at a median follow-up of 15 months, mPFS was not reached (95% CI: 19.3-NR) vs 14.7 months (95% CI: 13.0-16.5); HR=0.556 (95% CI: 0.429-0.720); $P<0.0001$.^{1,2,6}

Results from the 56-month exploratory analysis from MONALEESA-3 and 54-month exploratory analysis from MONALEESA-7 were not prespecified and were observational in nature; as such, there was no prespecified statistical procedure controlling for type 1 error.

IMPORTANT SAFETY INFORMATION

Warnings and precautions with KISQALI include interstitial lung disease/pneumonitis, severe cutaneous adverse reactions, QT interval prolongation, increased QT interval prolongation with concomitant use of tamoxifen, hepatobiliary toxicity, neutropenia, and embryofetal toxicity.

Most common adverse reactions (incidence $\geq 20\%$) are neutropenia, nausea, infections, fatigue, diarrhea, leukopenia, vomiting, alopecia, headache, constipation, rash, and cough.



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References

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