Bimekizumab Treatment Resulted in Clinically Meaningful Improvements in the Psoriatic Arthritis Impact of Disease-12 (PsAID-12) Scores Using Pooled Results from Two Phase 3 Trials in Patients with Psoriatic Arthritis

Laure Gossec,[1] Laura C. Coates,[2] Ana-Maria Orbai,[3] Maarten de Wit,[4] Jérémy Lambert,[5] Barbara Ink,[6] Vanessa Taieb,[5] Dafna D. Gladman[7]

Objective

To assess the efficacy of bimekizumab in psoriatic arthritis from the patient perspective, over 16 weeks of treatment, using Psoriatic Arthritis Impact of Disease-12 questionnaire data from the phase 3 BE OPTIMAL and BE COMPLETE trials.

Background

- The Psoriatic Arthritis (PsA) Impact of Disease-12 (PsAID-12) questionnaire is a patient-reported outcome measure that assesses the impact of PsA on 12 physical, social and psychological domains from the patient perspective.[1,2]
- PsAID-12 has been endorsed as a core outcome measure for disease-specific health-related quality of life by the Group for Research and Assessment of Psoriasis and PsA-Outcome Measure in Rheumatology (GRAPPA-OMERACT) for use in randomised controlled trials and longitudinal observational studies.[2]
- Bimekizumab (BKZ), a monoclonal IgG1 antibody that selectively inhibits interleukin (IL)-17F in addition to IL-17A, has shown superior efficacy versus placebo to 16 weeks in patients with PsA in BE OPTIMAL (biologic disease-modifying antirheumatic drug [bDMARD]-naïve) and BE COMPLETE (tumour necrosis factor-α inhibitor-inadequate response [TNF-IR]).[3,4]

Methods

- Patients randomised to subcutaneous BKZ 160 mg every 4 weeks (Q4W) or placebo in BE OPTIMAL (NCT03895203; BKZ n=431, placebo n=281) and BE COMPLETE (NCT03896581; BKZ n=267, placebo n=133) were pooled in this analysis (BKZ n=698, placebo n=414).[2,3]
- PsAID-12 total and single-item domain scores range from 0 to 10; higher scores indicate a worse status.
- Change from baseline data and proportion of responders defined as patients achieving the minimal clinically meaningful within-patient (CMWP) improvement response (threshold: decrease of ≥3 from baseline when respective PsAID-12 score ≥3 at baseline) for total and single-item domain scores were calculated.[5]
- Missing data were imputed using multiple imputation for continuous and non-responder imputation for binary outcomes.

Results

- Of 1,112 patients randomised to BKZ or placebo, 1,073 (96.5%) completed to Week 16.
- Baseline characteristics were generally similar and well balanced between treatment groups within the two trials (**Table 1**).
- At Week 16, an improved total score was achieved in BKZ-treated patients vs placebo-treated patients. Improvement from baseline in PsAID-12 total score was observed as early as Week 4 in BKZ-treated patients (**Figure 1**).
- Improvements were seen in all domains at Week 16 (**Figure 2**), with greater improvements observed by Week 16 in key symptoms of **pain** (mean change from baseline [SE]: −2.3 [0.1] BKZ, −0.6 [0.1] placebo), **skin problems** (−2.9 [0.1] BKZ, −0.4 [0.1] placebo) and **fatigue** (−1.8 [0.1] BKZ, −0.6 [0.1] placebo). In domains with low baseline scores, indicating patients were generally doing well at baseline, improvements from baseline were less pronounced.
- The CMWP response rate at Week 16 for PsAID-12 total score was 41.9% in BKZ-treated patients and meaningfully higher than the 8.4% achieved by placebo-treated patients (**Figure 3**).
- A greater proportion of BKZ-treated patients achieved CMWP improvements at Week 16 compared with placebo in all domains, including **pain** (46.5% BKZ, 18.7% placebo), **skin problems** (68.5% BKZ, 21.4% placebo) and **fatigue** (44.7% BKZ, 20.7% placebo; **Figure 3**).
  - PsAID-12 improvements from baseline and responder rates were generally similar between trials (**Table 2**).

Conclusions

By Week 16, over half of bimekizumab treated patients reported clinically meaningful improvements in most PsAID-12 single-item domain scores assessing PsA-specific symptoms and impact versus placebo. The results presented here may support shared decision making with patients.

Summary

1,073/1,112 (96.5%) patients with active PsA treated with bimekizumab 160 mg Q4W or placebo in BE OPTIMAL (bDMARD-naïve) or BE COMPLETE (TNFi-IR) completed Week 16

Proportion of patients that achieved clinically meaningful response in PsAID-12 total score and the single-item domains pain, skin problems and fatigue:

Using validated thresholds for the single-item domains, patients receiving bimekizumab demonstrated clinically meaningful improvements versus placebo at Week 16

Table 1 Pooled baseline demographics and disease characteristics from BE OPTIMAL and BE COMPLETE

	BE OPTIMAL (bDMARD-naïve) + BE COMPLETE (TNFi-IR)	
	PBO n=414	BKZ 160 mg Q4W n=698
Age, years, mean (SD)	49.5 (12.2)	49.1 (12.5)
Male, n (%)	187 (45.2)	331 (47.4)
BMI, kg/m², mean (SD)	29.4 (5.9)	29.6 (6.7)
BSA affected by psoriasis ≥3%, n (%)	228 (55.1)	393 (56.3)
PASI score,[a] mean (SD)	8.1 (6.0)	9.1 (8.0)
Time since diagnosis, years, mean (SD)	6.8 (7.3)[b]	7.4 (8.6)[c]
SJC (of 66 joints), mean (SD)	9.7 (7.6)	9.2 (6.7)
TJC (of 68 joints), mean (SD)	17.8 (13.1)	17.4 (12.5)
Enthesitis,[d] n (%)	106 (25.6)	249 (35.7)
Dactylitis,[e] n (%)	47 (11.4)	90 (12.9)
hs-CRP ≥6 mg/L, n (%)	180 (43.5)	276 (39.5)
PsAID-12 total score, mean (SE)	4.2 (0.1)	4.1 (0.1)
PGA-PsA, mean (SD)	60.0 (23.1)	56.8 (23.3)[f]
PhGA-PsA, mean (SD)	57.4 (16.3)[g]	58.0 (16.7)[h]
HAQ-DI, mean (SD)	0.94 (0.64)	0.88 (0.59)[i]
PtAAP, mean (SD)	58.4 (23.8)	55.4 (24.3)[i]

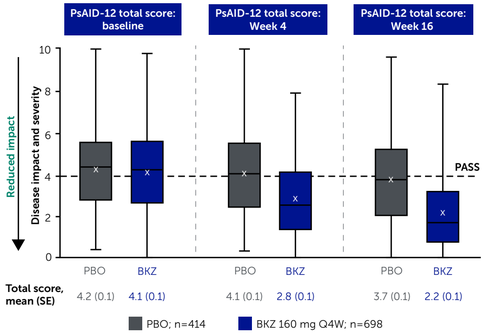
[a]For patients with psoriasis involving at least 3% BSA at baseline; [b]n=411; [c]n=689; [d]As per the Leeds Enthesitis Index; [e]As per the Leeds Dactylitis Index; [f]n=697; [g]n=412; [h]n=693.

Table 2 Individual trial baseline scores, Week 16 change from baseline and CMWP response rate for PsAID-12 total and single-item domain scores (NRI and MI)

	BE OPTIMAL (bDMARD-naïve)				BE COMPLETE (TNFi-IR)			
	PBO n=281		BKZ 160 mg Q4W n=431		PBO n=133		BKZ 160 mg Q4W n=267	
	Week 16 CfB mean (SE) [MI]	Response rate[a] % (n/N) [NRI]	Week 16 CfB mean (SE) [MI]	Response rate[a] % (n/N) [NRI]	Week 16 CfB mean (SE) [MI]	Response rate[a] % (n/N) [NRI]	Week 16 CfB mean (SE) [MI]	Response rate[a] % (n/N) [NRI]
Total score	−0.5 (0.1)	10.1 (20/198)	−1.8 (0.1)	36.8 (109/296)	−0.3 (0.2)	5.0 (5/101)	−2.2 (0.1)	49.5 (98/198)
Pain	−0.6 (0.1)	19.3 (48/249)	−2.2 (0.1)	44.4 (164/369)	−0.4 (0.2)	17.5 (21/120)	−2.6 (0.2)	49.8 (118/237)
Fatigue	−0.7 (0.1)	23.8 (54/227)	−1.6 (0.1)	41.9 (134/320)	−0.3 (0.2)	13.9 (14/101)	−2.2 (0.2)	48.9 (107/219)
Skin problems	−0.4 (0.2)	22.6 (44/195)	−2.7 (0.2)	67.6 (200/296)	−0.5 (0.2)	19.3 (21/109)	−3.2 (0.2)	69.8 (148/212)
Work and/or leisure activities	−0.6 (0.2)	26.2 (55/210)	−2.1 (0.1)	51.9 (164/316)	−0.6 (0.2)	23.1 (24/104)	−2.5 (0.2)	56.3 (117/208)
Functional capacity	−0.6 (0.1)	22.4 (50/223)	−2.2 (0.1)	51.7 (172/333)	−0.6 (0.2)	24.8 (26/105)	−2.5 (0.2)	55.2 (117/212)
Discomfort	−0.6 (0.2)	25.5 (49/192)	−2.2 (0.1)	53.3 (163/306)	−0.5 (0.2)	25.2 (26/103)	−2.5 (0.2)	65.4 (134/205)
Sleep disturbance	−0.7 (0.2)	33.3 (56/168)	−1.4 (0.1)	51.1 (120/235)	0.1 (0.2)	17.9 (14/78)	−1.9 (0.2)	59.6 (102/171)
Coping	−0.7 (0.1)	26.6 (50/188)	−1.6 (0.1)	50.5 (139/275)	−0.3 (0.2)	20.2 (20/99)	−2.0 (0.2)	58.2 (106/182)
Anxiety, fear and uncertainty	−0.4 (0.1)	32.7 (36/110)	−0.8 (0.1)	56.0 (79/141)	0.2 (0.2)	35.0 (14/40)	−1.1 (0.2)	59.8 (55/92)
Embarrassment and/or shame	−0.2 (0.2)	36.8 (39/106)	−1.4 (0.1)	68.5 (111/162)	−0.2 (0.2)	34.4 (21/61)	−1.9 (0.2)	73.8 (76/103)
Social participation	−0.4 (0.2)	36.3 (45/124)	−1.4 (0.1)	60.3 (111/184)	−0.5 (0.2)	36.2 (25/69)	−1.7 (0.2)	62.0 (80/129)
Depression	0.0 (0.1)	30.0 (18/60)	−0.4 (0.1)	68.1 (47/69)	0.1 (0.2)	25.9 (7/27)	−1.0 (0.1)	69.0 (49/71)

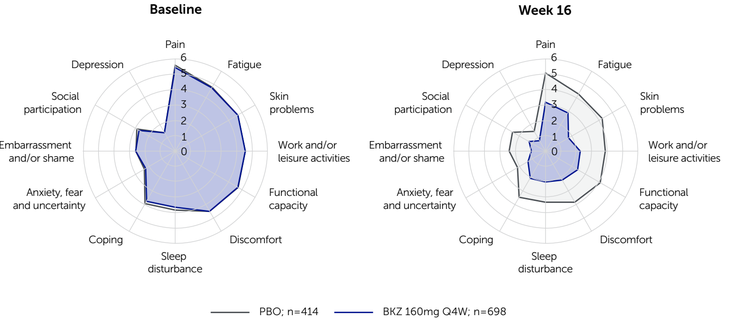
Randomised set. PsAID-12 scores range from 0–10; higher scores indicate a worse status. [a]CMWP response rate: decrease in score from baseline ≥3 in patients with score ≥3 at baseline.

Figure 1 Pooled PsAID-12 total score at baseline, Week 4 and Week 16 (MI)



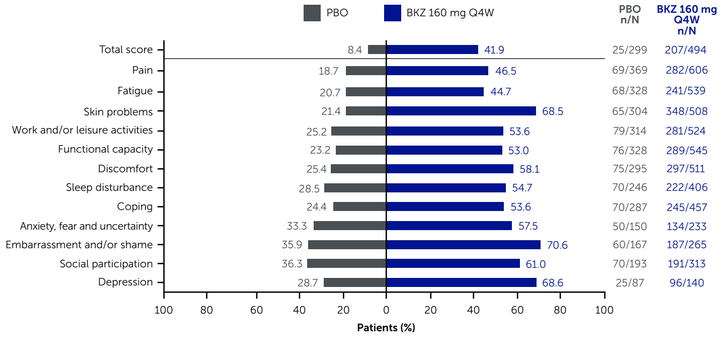
Randomised set. The X in each box denotes the mean, the midline of each box depicts the median, the box depicts Q1 and Q3 and the whiskers are the minimum and maximum values. The cut-off value for PASS was estimated as the 75% centile of patients considering themselves in an acceptable state at baseline.[3]

Figure 2 Pooled PsAID-12 single-item domain mean scores at baseline and Week 16 (MI)



Randomised set.

Figure 3 Proportion of patients achieving a CMWP improvement (from baseline ≥3) in pooled PsAID-12 total and single-item domain scores at Week 16 (NRI)



Randomised set, in patients with an item score of ≥3 at baseline.

BMI: body mass index; **BKZ:** bimekizumab; **BSA:** body surface area; **bDMARD:** biologic disease-modifying antirheumatic drug; **CfB:** change from baseline; **CMWP:** clinically meaningful within-patient; **GRAPPA-OMERACT:** Group for Research and Assessment of Psoriasis and Psoriatic Arthritis-Outcome Measure in Rheumatology; **HAQ-DI:** Health Assessment Questionnaire-Disability Index; **hs-CRP:** high-sensitivity C-reactive protein; **IL:** interleukin; **MI:** multiple imputation; **NRI:** non-responder imputation; **PASI:** Psoriasis Area and Severity Index; **PASS:** patient-acceptable symptom state; **PBO:** placebo; **PGA-PsA:** Patient's Global Assessment for Psoriatic Arthritis; **PhGA-PsA:** Physician's Global Assessment for Psoriatic Arthritis; **PsA:** psoriatic arthritis; **PsAID-12:** Psoriatic Arthritis Impact of Disease-12; **PtAAP:** Patient's Assessment of Arthritis Pain; **Q1:** first quartile; **Q3:** third quartile; **Q4W:** every 4 weeks; **SD:** standard deviation; **SE:** standard error; **SJC:** swollen joint count; **TJC:** tender joint count; **TNFi-IR:** tumour necrosis factor-α inhibitor-inadequate response.

Affiliations: [1]Sorbonne Universite and Pitie-Salpetriere Hospital, Paris, France; [2]Oxford University Hospitals NHS Trust, Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Diseases, University of Oxford and Oxford Biomedical Research Centre, Oxford, United Kingdom; [3]Johns Hopkins University School of Medicine, Division of Rheumatology, Baltimore, MD, USA; [4]Stichting Tools, Patient Research Partner, Amsterdam, the Netherlands; [5]UCB Pharma, Colombes, France; [6]UCB Pharma, Slough, United Kingdom; [7]University of Toronto, Schroeder Arthritis Institute, Krembil Research Institute, Toronto Western Hospital, University Health Network, Ontario, Canada.

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