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Comparative Efficacy of Approved IL-17 Inhibitors for Moderate-to-Severe Plaque Psoriasis: A Systematic Literature Review and Bayesian Network Meta-Analysis

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BACKGROUND

- Interleukin 17 (IL-17) inhibitors (Secukinumab, Ixekizumab, Brodalumab and Bimekizumab) are approved targeted therapies for moderate-to-severe plaque psoriasis.[1]
- Given the limited number of head-to-head trials, comparative efficacy is primarily assessed using indirect evidence from randomized controlled trials (RCTs).
- To our knowledge, this is one of the first network meta-analyses (NMAs) to evaluate all four approved IL-17 inhibitors for moderate-to-severe plaque psoriasis dose by dose, including dose-ranging arms.

OBJECTIVE

- This systematic literature review (SLR) and Bayesian NMA aimed to compare the efficacy of approved IL-17 inhibitors in adults with moderate-to-severe plaque psoriasis.
- Efficacy was measured as percentage improvement in the Psoriasis Area and Severity Index (PASI) score: PASI 75 at week 12 was the primary outcome, and PASI 90 and PASI 100 were additional outcomes.

METHODS

Figure 1. Study workflow of the SLR and Bayesian NMA

1. Eligibility criteria
- Adult patients (≥ 18 years) with moderate-to-severe plaque psoriasis
- Double-blind RCTs (n ≥ 20) published in English
- Approved IL-17 inhibitors compared with placebo, an active comparator or another dose

2. Systematic search
- PubMed (MEDLINE), Google Scholar and ClinicalTrials.gov were searched from inception to May 2026
- Supplementary searches included citation searching

3. Screening
- Titles and abstracts, then full texts, assessed for inclusion
- Screening was conducted in duplicate

4. Data extraction
- PASI results extracted at 12-weeks
- Outcomes of interest: PASI 75 (primary)
- PASI 90 and PASI 100

5. Risk-of-bias assessment[2]
- Methodological quality assessed using the Cochrane risk-of-bias tool (RoB-I) (seven domains)

6. Bayesian network meta-analysis[3]
- Random-effects model in R 4.4.3 (gemtc)
- 4 chains, 100,000 iterations per chain, 5,000 burn-in iterations
- Each dose regimen analysed as a separate node
- Results calculated as risk ratios (RRs) with 95% credible intervals (CrIs) vs placebo; treatments ranked using surface under the cumulative ranking curve (SUCRA)

7. Results for each outcome
- Forest plot (A), SUCRA (B) and evidence network (C) for each outcome

PASI 75	PASI 90	PASI 100
Primary outcome		

CrI, credible interval; IL-17, interleukin 17; NMA, network meta-analysis; PASI 75, PASI 90 and PASI 100, at least 75%, at least 90% and 100% improvement from baseline in the Psoriasis Area and Severity Index; RCT, randomised controlled trial; RR, risk ratio; SLR, systematic literature review; SUCRA, surface under the cumulative ranking curve.

CONCLUSIONS

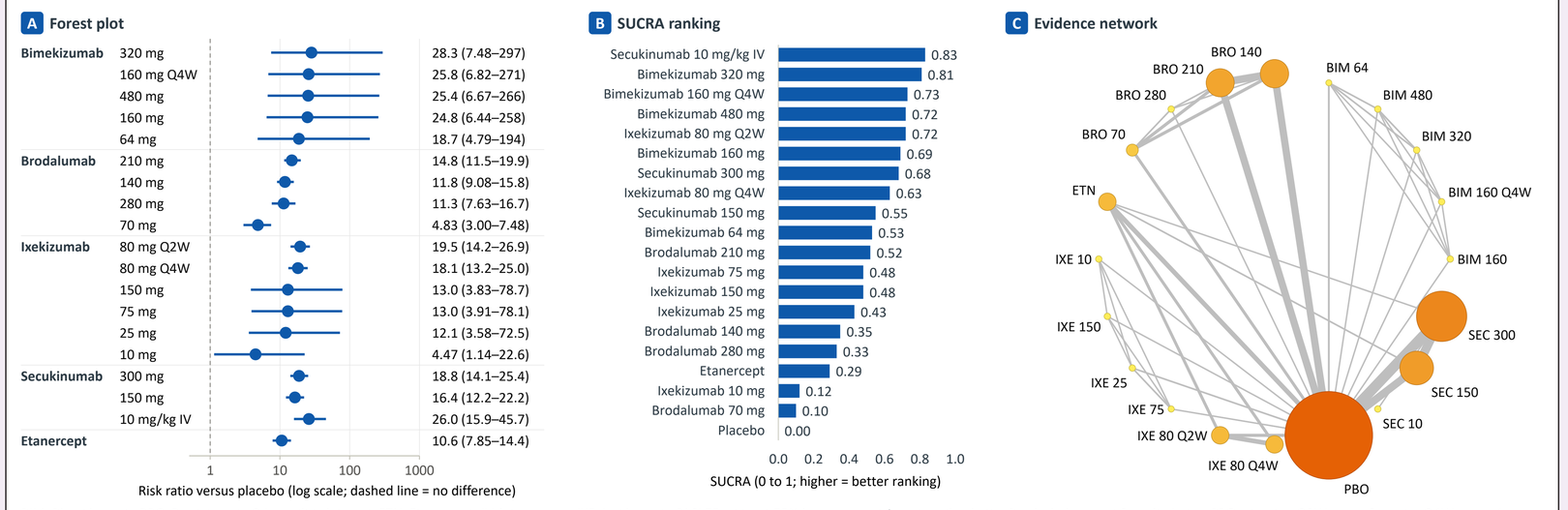
- **This systematic literature review and NMA found that almost all evaluated IL-17 inhibitor regimens were associated with higher PASI 75, PASI 90, and PASI 100 response rates than placebo at Week 12.**
- **Secukinumab 300 mg, bimekizumab 320 mg, brodalumab 210 mg, and ixekizumab 80 mg showed favorable treatment effects across the evaluated PASI response outcomes.**
- **Treatment effect estimates varied across regimens and outcomes, with overlapping credible intervals. Given the sparse, predominantly placebo-connected evidence network, the relative effects of individual IL-17 inhibitors remain uncertain.**
- **Longer-term comparative data and head-to-head trials are needed to further evaluate the relative efficacy of IL-17 inhibitors.**

RESULTS

- A total of 29 RCTs, including 18,858 participants, were included (21 identified from 497 database records and 8 through citation searching).
- The evidence networks included 19 (PASI 75), 19 (PASI 90) and 16 (PASI 100) active regimens and placebo.

Figure 2. PASI 75 at week 12

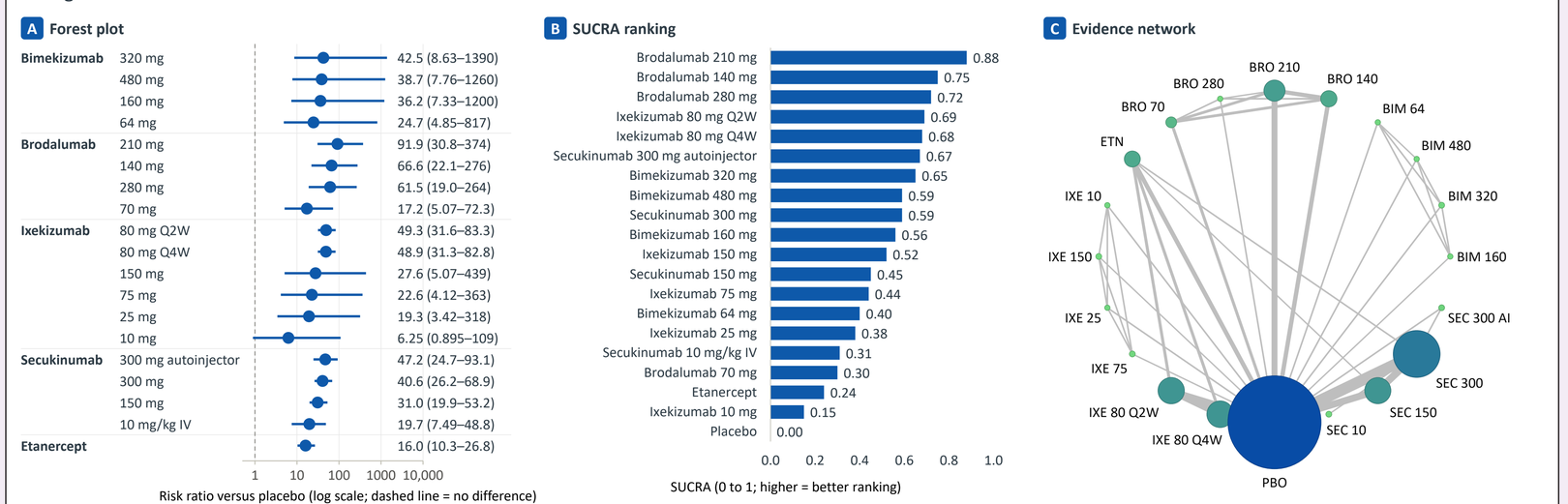
- All 19 active regimens were more effective than placebo for PASI 75 at week 12, the RR range was 4.47 to 28.3.
- Bimekizumab 320 mg had the highest point estimate (RR 28.3, 95% CrI 7.48–297) and the highest SUCRA among approved regimens (0.81). However, Secukinumab, Brodalumab and Ixekizumab 80mg exhibit better treatment effect as their CrIs appear with narrow range, also this results agree with higher SUCRA ranking.



BIM, Bimekizumab; BRO, Brodalumab; CrI, credible interval; ETN, Etanercept; IV, intravenous; IXE, Ixekizumab; PASI 75, at least 75% improvement from baseline in the Psoriasis Area and Severity Index; PBO, placebo; Q2W, every 2 weeks; Q4W, every 4 weeks; RR, risk ratio; SEC, Secukinumab; SUCRA, surface under the cumulative ranking curve. Network labels give the agent and dose in mg.

Figure 3. PASI 90 at week 12.

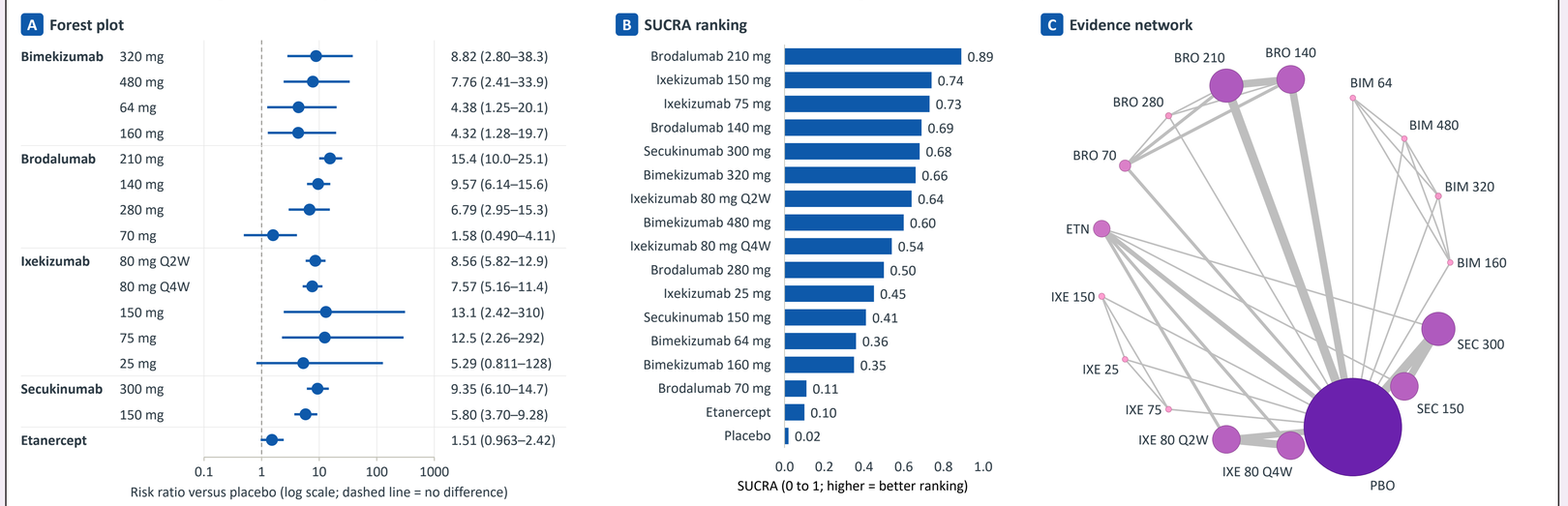
- 18 of the 19 active regimens were more effective than placebo for PASI 90 at week 12, the RR range was 16.0 to 91.9; the exception was Ixekizumab 10 mg (RR 6.25, 95% CrI 0.895–109).
- Brodalumab 210 mg had the highest point estimate (RR 91.9, 95% CrI 30.8–374) and the highest SUCRA (0.88), though credible intervals overlapped across approved regimens.



BIM, Bimekizumab; BRO, Brodalumab; CrI, credible interval; ETN, Etanercept; IV, intravenous; IXE, Ixekizumab; PASI 90, at least 90% improvement from baseline in the Psoriasis Area and Severity Index; PBO, placebo; Q2W, every 2 weeks; Q4W, every 4 weeks; RR, risk ratio; SEC, Secukinumab; SUCRA, surface under the cumulative ranking curve. Network labels give the agent and dose in mg.

Figure 4. PASI 100 at week 12.

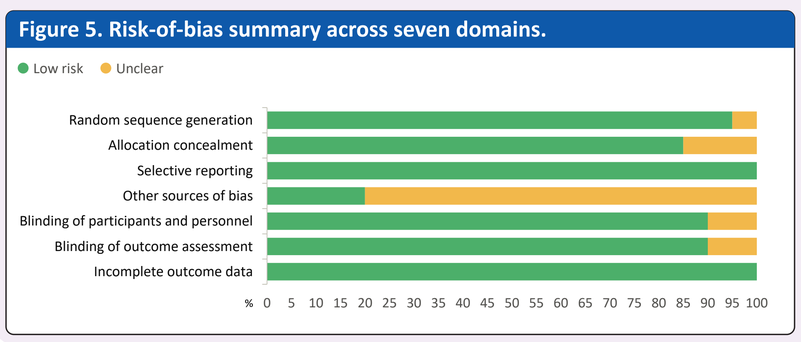
- 13 of the 16 active regimens were more effective than placebo for PASI 100 at week 12, the RR range was4.32 to 15.4; the exceptions were Brodalumab 70 mg, Ixekizumab 25 mg and etanercept (95% CrIs including 1).
- Brodalumab 210 mg had the highest point estimate (RR 15.4, 95% CrI 10.0–25.1) and the highest SUCRA (0.89).



BIM, Bimekizumab; BRO, Brodalumab; CrI, credible interval; ETN, Etanercept; IXE, Ixekizumab; PASI 100, 100% improvement from baseline in the Psoriasis Area and Severity Index; PBO, placebo; Q2W, every 2 weeks; Q4W, every 4 weeks; RR, risk ratio; SEC, Secukinumab; SUCRA, surface under the cumulative ranking curve. Network labels give the agent and dose in mg.

- **Risk of bias:** The overall risk of bias was low in almost all domains **(Figure 5)**

Figure 5. Risk-of-bias summary across seven domains.



LIMITATIONS

- The evidence is indirect and placebo-centred: no trial in the networks compares two IL-17 agents, so comparisons between agents rest on the assumption of similar trial populations and placebo response. Sparse nodes (for example, Bimekizumab) have wide CrIs.
- This study analysed only week-12 data. Different studies contribute to each outcome (19, 19 and 16 active regimens), so RRs are not directly comparable across PASI thresholds.
- Only English language articles were included in this analysis; 42 of the 87 retained reports had no free full text.
- Limited access to freely available databases may have resulted in the omission of some relevant studies.

References

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Disclosures

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