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Cost per responder analysis of bimekizumab against licensed anti-interleukin-17A therapies in axial spondyloarthritis from a UK perspective focusing on BASDAI50 treatment response

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Objective

To compare the cost per responder (CPR) of bimekizumab, a monoclonal IgG1 antibody that selectively inhibits interleukin (IL)-17F in addition to IL-17A, against other licensed IL-17A inhibitors for the treatment of radiographic (r-) and non-radiographic (nr-) axial spondyloarthritis (axSpA) in the UK.

Introduction

- AxSpA is a type of chronic inflammatory arthritis primarily affecting the joints in the axial skeleton (chest, spine and pelvis). It belongs to a group of conditions known as spondyloarthritis, which are characterised by inflammation in the joints and entheses[1,2]
- AxSpA is classified as radiographic axial spondyloarthritis (r-axSpA also known as ankylosing spondylitis) and non-radiographic axial spondyloarthritis (nr-axSpA)[1]
- Bimekizumab, a monoclonal IgG1 antibody that selectively inhibits interleukin (IL)-17F in addition to IL-17A, has shown to be an effective option for managing a biologic-naïve and inadequate responder patient group across the axSpA spectrum, with similar safety and tolerability to existing treatments[2]
- Bimekizumab is licensed as an option in adults for treating active ankylosing spondylitis (AS) when conventional therapy has not worked well enough or is not tolerated, or active non-radiographic axial spondyloarthritis (nr-axSpA) with objective signs of inflammation (shown by elevated C-reactive protein or MRI) when non-steroidal anti-inflammatory drugs (NSAIDs) have not worked well enough or are not tolerated[3]
- The Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) score is a gold standard visual analog scale for measuring and following disease activity and thus functional status in people with axSpA. A change of at least 50% in the BASDAI from baseline is usually considered as reflecting a clinically relevant improvement[4]
- BASDAI was selected as one of the clinically relevant outcomes in the UK, where NICE recommends a 50% reduction or a change of more than 2 points to assess adequate response and justify continuation of treatment[4]

Materials and Methods

- A 16-week cost-per-responder (CPR) model was developed based on a published network meta-analysis (NMA) that analysed approved biologic and targeted systemic disease-modifying anti-rheumatic drugs for axSpA[4,5]
- The analysis included licensed anti-interleukin-17A treatments; bimekizumab (administered at 160mg monthly), ixekizumab (160mg for first dose then 80mg monthly) and secukinumab (nr-axSpA and r-axSpA; 150mg weekly for 5 doses then a monthly maintenance dosing). Additionally, a monthly maintenance dose of secukinumab 300mg in r-axSpA population was also included, aligning with dosage recommendations found in the British National Formulary (BNF) and summary of product characteristics (**Tables 1 and 2**)
- The CPR tool employed a Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) as a primary outcome measure for a predominantly biologic-naïve population with r-axSpA and nr-axSpA. BASDAI50 response rates were used to evaluate treatment efficacy (**Tables 1 and 2**)
- Drug costs and dose recommendations were based on the NHS list prices outlined in the BNF (2024) without considering any potential local or national discounts that may be available. The model applied combined regimens for secukinumab (SEC) in the r-axSpA population, based on dual dose ratios of 66% for SEC 150mg and 34% for SEC 300mg, as outlined in market research commissioned by UCB[6-10]
- The CPR was calculated by multiplying the number of doses required in the first 16 weeks of treatment by the drug cost, divided by the response rate
- The CPR tool utilised response rates derived from an NMA, which was based on a systematic literature review (SLR) conducted in 2022 to identify randomised controlled trial (RCT) evidence on the efficacy and safety of bimekizumab and relevant comparators in patients with axSpA
- In the NMA, the predominantly naïve network provided a more complete set of results across outcomes and comparators

Results

- Bimekizumab demonstrated the lowest cost per responder for BASDAI50 in both the r-axSpA (£14,788) and nr-axSpA predominantly naïve populations (£13,163) **(Figures 1 and 2)**
- Secukinumab demonstrated the highest cost per responder for BASDAI50 (£17,285) in the r-axSpA population whilst ixekizumab demonstrated the highest cost per responder for BASDAI50 (£19,795) in the nr-axSpA population **(Figures 1 and 2)**

Summary of cost per responder results in predominantly naïve (r-) and (nr-) axSpA population

As per the analysis, bimekizumab demonstrated the lowest cost-per-responder compared to other currently licensed IL-17A inhibitor biologic treatments, based on NHS list price.

nr-axSpA patients predominantly naïve patients	
BASDAI50	Bimekizumab is ranked 1st against 3 treatments licensed for treating nr-axSpA

r-axSpA predominantly naïve patients	
BASDAI50	Bimekizumab is ranked 1st against 3 treatments licensed for treating r-axSpA

Table 1 Response rates at week 16 in predominantly naïve nr-axSpA patients

IL inhibitor biologic treatment	BASDAI50 response probability at week 16 (%)	Cost per patient for first 16 weeks treatment based on list price‡	Cost per responder based on list price
Bimekizumab (Bimzelx®) 160mg Q4W	46.40	£6,108	£13,163
Ixekizumab (Taltz®) 160mg for 1 dose then 80mg Q4W	34.10	£6,750	£19,795
Secukinumab (Cosentyx®) 150mg weekly for 5 doses then Q4W	36.40	£4,875	£13,393

Table 2 Response rates at week 16 in predominantly naïve r-axSpA patients

IL inhibitor biologic treatment	BASDAI50 response probability at week 16 (%)	Cost per patient for first 16 weeks treatment based on list price‡	Cost per responder based on list price
Bimekizumab (Bimzelx®) 160mg Q4W	41.30	£6,108	£14,788
Ixekizumab (Taltz®) 160mg for 1 dose then 80mg Q4W	44.80	£6,750	£15,067
Secukinumab (Cosentyx®) combined dose†	31.80	£5,497	£17,285

‡ Cost per patient includes week 16 dose.
† The recommended dose for secukinumab in r-axSpA is 150mg weekly for 5 doses then Q4W or 150mg weekly for 5 doses then 300mg Q4W according to clinical response[7]. SEC 300 is modeled to occur at the earliest posible interval based on the selected ratio for simplicity.

Figure 1 BASDAI50 cost per responder at week 16 in predominantly naïve nr-axSpA patients

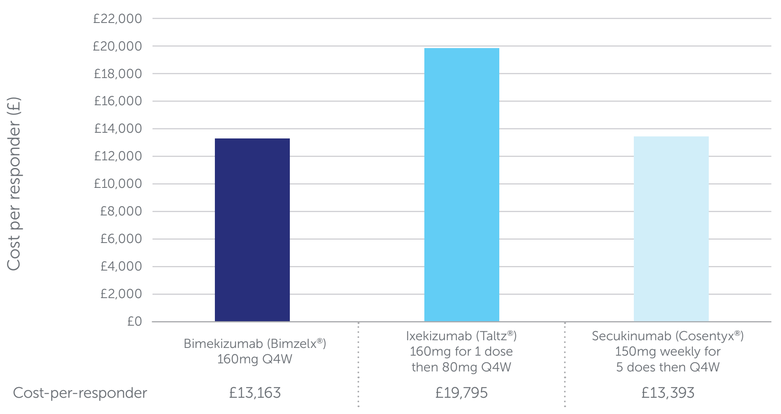
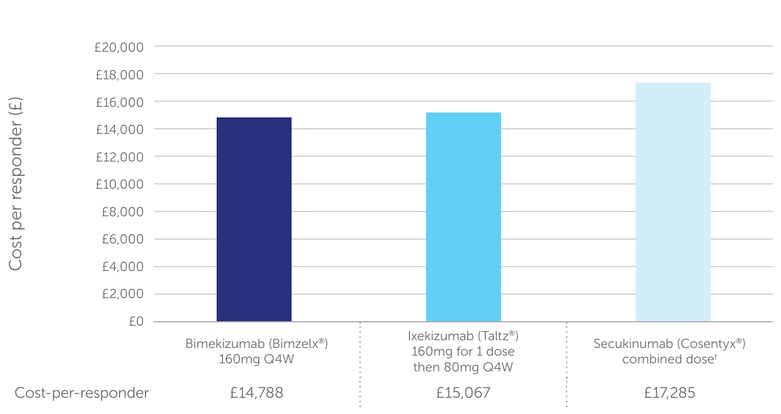


Figure 2 BASDAI50 cost per responder at week 16 in predominantly naïve r-axSpA patients



Conclusions

Across the predominantly naïve axSpA population eligible for treatment in the UK, bimekizumab demonstrated the lowest cost per responder for achieving a 50% reduction in BASDAI at week 16 in both radiographic and non-radiographic axSpA, compared to other licensed IL-17A inhibitors based on NHS list prices.

Limitations

- The NMA included other biologic therapies and oral treatments that are not included in this CPR analysis
- There are a very limited number of head-to-head randomised controlled trials that exist for IL-17 inhibitor therapies in axSpA. Results are based on clinical data and therefore CPR may be different in clinical practice
- The NMA also included both bDMARD-naïve and TNFi-experienced networks; however, subgroup data were not provided for some key outcomes and comparators
- Cost calculations are based on the NHS list price and include the week 16 dose for all treatments
- Costs relating to drug administration and monitoring are not taken into account

CPR: Cost per responder; axSpA: Axial spondyloarthritis; IL: interleukin; IgG1: Immunoglobulin G1; NMA: Network Meta-Analyses; BASDAI: Bath Ankylosing Spondylitis Disease Activity Index; AS: Ankylosing spondylitis; r-axSpA: radiographic axial spondyloarthritis; nr-axSpA: non-radiographic axial spondyloarthritis; NHS: National Health Service; NICE: National Institute for Health and Care Excellence; Q4W: every 4 weeks; UK: United Kingdom; SEC: Secukinumab; bDMARD: Biologic or targeted synthetic disease-modifying antirheumatic drug; TNFi: Tumor necrosis factor inhibitor; MRI: Magnetic resonance imaging.

Institutions: UCB Pharma, Berkshire, UK,[1]; MMP – London, UK,[2]; UCB Pharma, Brussels, Belgium,[3]

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Author Contributions: Substantial contributions to study conception/design, or acquisition/analysis/interpretation of data: NB, TR, CM,FO,NL and DM. **Author Disclosures:** This NMA and CPR analysis was funded by UCB Pharma. Analysis was provided by MMP and funded by UCB Pharma. Acknowledgments: The authors are employees of UCB and provided insights that assisted in the preparation of the abstract. All costs associated with the development of this presentation were funded by UCB Pharma. Costello Medical provided review management.

Presented at ISPOR I Barcelona I 17 – 20 November 2024