

Cost-Effectiveness Analysis of Biologics for the Treatment of Ankylosing Spondylitis in China

EE275

Jiaqi Shi¹, Wenxin Zhou¹, Tong Lin¹, Fengbo Wu, PhD^{2*}, Ming Hu, PhD^{1*}
¹ West China School of Pharmacy, Sichuan University, Chengdu, China
² Department of Pharmacy, West China Hospital of Sichuan University, China

Date: Tuesday, May 7, 2024
 Poster Session Time: 10:30 AM - 1:30 PM

BACKGROUND

- Ankylosing spondylitis (AS) is a chronic, progressive autoimmune disease characterized by the involvement of the sacroiliac joints, spinal bony prominences, paraspinal soft tissues, and peripheral joints.
- The introduction of biologic therapies has changed the treatment pathway for patients with AS, as reflected in the latest guidelines published by the Spondylarthritis International Society (2022EULAR:ax-SpA). These guidelines underline that **biologics** should be considered primarily for patients with persistently high disease activity despite conventional treatments.
- Biologics therapies are classified into different types depending on the target of action, such as **tumour necrosis factor inhibitors** (TNFis), **interleukin-17** (IL-17) inhibitors, **Janus kinase** (JAK) inhibitors etc.

Ankylosing spondylitis (AS)

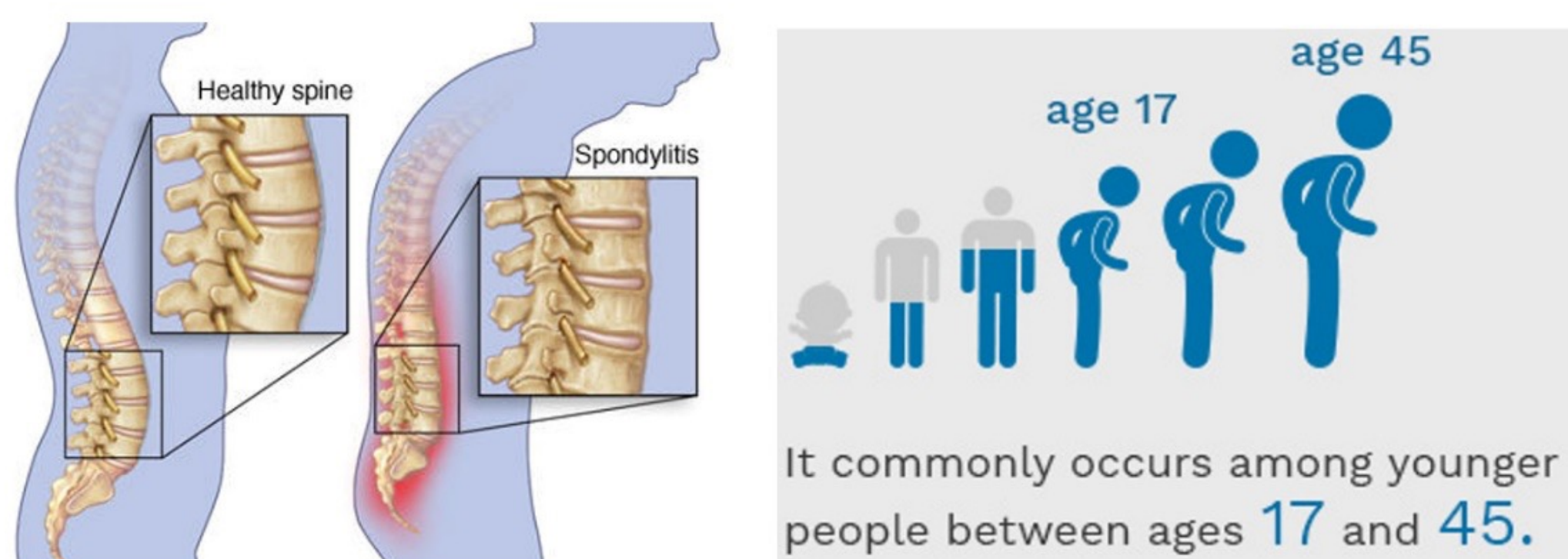


Figure1 Clinical features of Ankylosing spondylitis (AS)

OBJECTIVES

This study aimed to evaluate the cost-effectiveness of conventional care (CC) and seven first-line biologics marketed in China for the treatment of patients with ankylosing spondylitis (AS) from the perspective of the Chinese health system.

METHODS

Interventions and Comparators

- Tumour necrosis factor inhibitor (Etanercept, Adalimumab, Infliximab, and Golimumab); IL-17 inhibitors (Secukinumab and Ixekizumab); JAK inhibitor (Tofacitinib)

Data and Source

Parameters were captured from **network meta-analyses** and literature including treatment response, short-term disease progression, patient functioning and long-term structural disease progression.

Model Structure

This study used the **York model** established by NICE. It is a 12-week decision tree model combined with the Markov model.

- If a patient achieves BASDAI50 (50% reduction in BASDAI score from baseline), they will enter a three-state Markov model as a responder to the biologic.
- If the patient does not reach BASDAI50, they will go directly to the CC state as nonresponders. Patients may remain there or go to the death state.
- Patients in the control group went directly to the conventional treatment state in the Markov CC.

Cost

This study calculates direct health care costs based on the Chinese health system perspective. In scenario analysis, the original drugs and biosimilars of seven biologics were included at the same time.

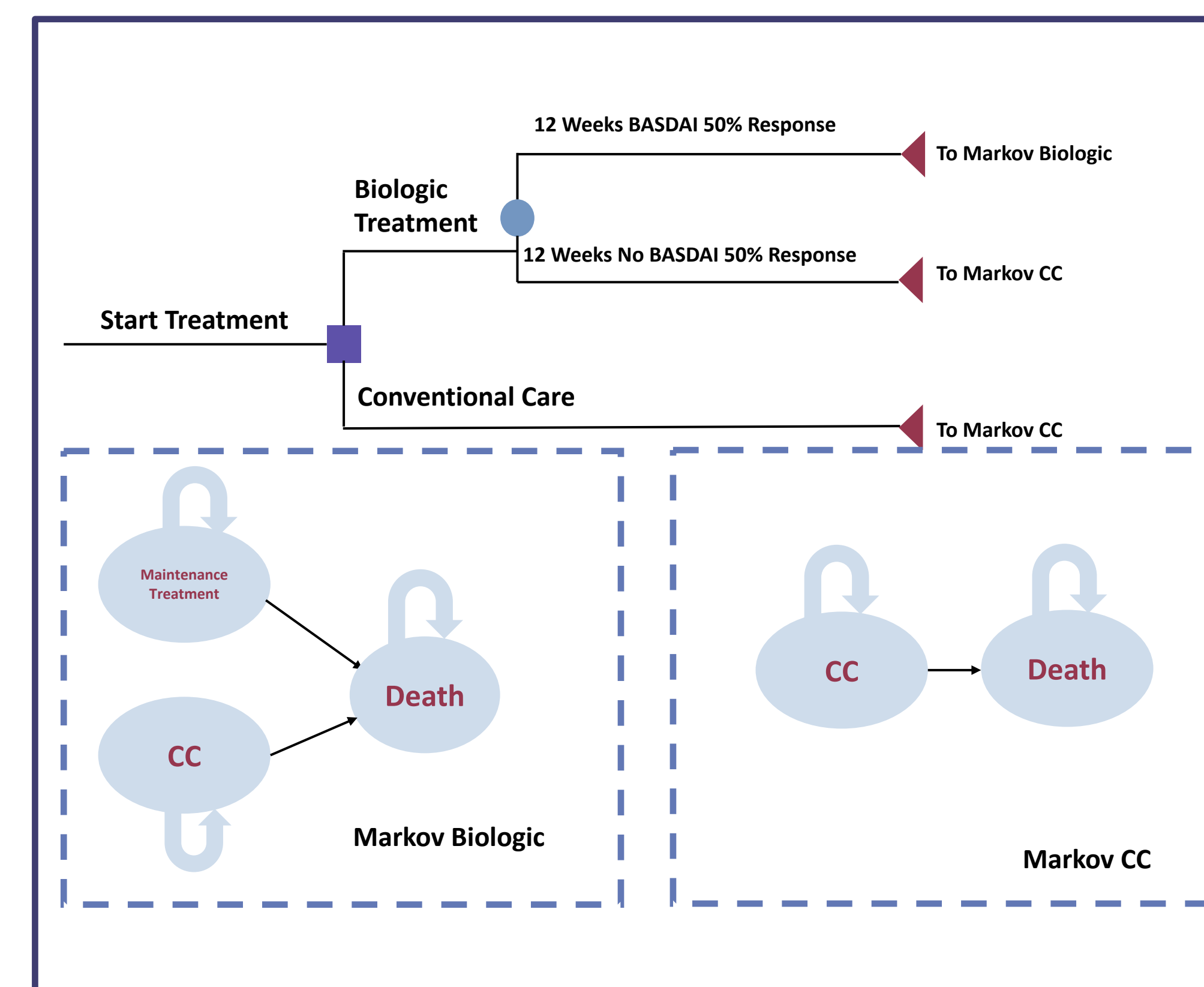


Figure2 York Model

RESULTS

Table 1 Base-case deterministic cost-effectiveness results

	Total Costs	Total QALYs	ICER
CC	¥80,429	7.55	
Tofacitinib	¥92,904	8.81	9,885.9
Ixekizumab	¥116,486	9.18	22,097.7
Etanercept	¥119,483	8.58	37,909.7
Secukinumab	¥123,551	9.38	23,551.7
Infliximab	¥154,413	9.21	44,441.9
Golimumab	¥294,313	9.60	104,217.4
Adalimumab	¥163,380	9.08	54,127.6

- Compared to those for CC, the ICERs for each biologic, were less than ¥268074/QALY (3 GDP/QALY.)
- When comparing the seven biologics, IL-17 inhibitors were the most cost-effective treatments, followed by JAK inhibitors and TNFi inhibitors. The specific economic ranks of the biologics were as follows: **secukinumab>ixekizumab>tofacitinib>infliximab>etanercept>adalimumab>golimumab**
- The choice of the brand-new price or biosimilar price can greatly affect economics.

DISCUSSION

The price factor had a greater impact on the results of this study. In recent years, **generic drugs** and **volume-based purchasing (VBP)** policies have emerged as crucial factors influencing drug prices.

- The development and promotion of generic drugs have been key strategies for ensuring affordable health care. When the prices were based on generic equivalents in the Chinese market, we observed **a shift in the economic ranking of the interventions.**
- The price of tofacitinib has substantially decreased under the influence of VBP. The price reduction of tofacitinib generics compared to that of the originator drug reached an impressive decrease of nearly 95%. **When considering the price of biosimilars, has gained a significant advantage in terms of cost-effectiveness compared to ixekizumab.**

CONCLUSION

Biologics are cost-effective treatments for AS. Overall, IL-17 inhibitors were the dominant treatment. The choice of the brand-new price or biosimilar price can greatly affect economics.

CONFLICT of INTEREST

The authors declare that no conflict of interest exists concerning this paper.

CONTRACT INFORMATION

Please contact Jiaqi Shi (shijiaqi000326@163.com) or presenter Ming Hu(huming@scu.edu.cn) with any questions regarding this study. We are more than happy to discuss!