

Ensuring Dermatologists Practice Enhanced Antibiotic Stewardship With Sarecycline Mnemonic

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ABSTRACT

It must be ensured that dermatologists practice enhanced antibiotic stewardship to combat antimicrobial resistance and negative consequences of microbiome dysbiosis. In order to help achieve this, we have developed a mnemonic ENLIGHTEN to help healthcare providers and patients understand sarecycline's features.

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INTRODUCTION

Therapeutic Challenge

How can we ensure dermatologists practice enhanced antibiotic stewardship to combat antimicrobial resistance and negative consequences of microbiome dysbiosis?

Solution

We developed a mnemonic ENLIGHTEN to help healthcare providers and patients understand sarecycline's features (Figure 1). Sarecycline is a novel narrow-spectrum, anti-inflammatory, third-generation tetracycline antibiotic used to treat acne vulgaris.¹ It is Food and Drug Administration approved to treat acne in patients 9 years of age and older, and has demonstrated 3-week early onset of action with efficacy decreasing acne on both the trunk and face. Sarecycline has high antimicrobial activity against the Gram-positive anaerobe *Cutibacterium acnes*, which decreases its propensity to induce antibiotic resistance. It inhibits protein translation in *C. acnes*, but unlike other tetracyclines, sarecycline directly contacts messenger RNA in the ribosome due to a large C7 moiety in its chemical structure.² This extra molecular contact generates greater bacteriostatic effect against *C. acnes* and reduces antibiotic resistance.³ Broad-spectrum tetracyclines are available to treat acne, but have more severe side effects including nausea, vomiting, and vaginal candidiasis. Gastrointestinal adverse effects (ie, gut dysbiosis) are uncommon with sarecycline due to its decreased activity against Gram-negative bacilli in the human intestinal microbiome.¹ Sarecycline has an established 12-month safety profile. Patients are more likely to comply with sarecycline since it is dosed by weight once daily instead of twice.

Precision/personalized medicine in dermatology requires renewed enlightenment about antibiotic stewardship, hence the mnemonic ENLIGHTEN condenses sarecycline information

FIGURE 1. Sarecycline mnemonic ENLIGHTEN. This sarecycline mnemonic captures key ways the narrow-spectrum, third generation tetracycline antibiotic for acne treatment facilitates improved antibiotic stewardship in medicine. G+, Gram positive.

- E ➤ Early onset of action (3 weeks)
- N ➤ Nine years of age and up
- L ➤ Low propensity for resistance
- I ➤ Interacts with mRNA due to unique structure
- G ➤ Gastrointestinal AE's uncommon
- H ➤ Heightened compliance with once daily dosing
- T ➤ Truncal efficacy in addition to facial
- E ➤ Established safety at 12 months
- N ➤ Narrow-spectrum tetracycline with G+ activity

to aid dermatologists in improving stewardship practice and communication with our patients.

DISCLOSURES

Dr. Emmy Graber has served as a speaker, consultant and advisor for Almirall. Dr. Christopher G. Bunick has served as an investigator, consultant, and speaker for and received honoraria from Almirall. Almirall has not provided any financial support for this manuscript. Dr. Jordan Borash has no conflicts of interest.

REFERENCES

1. Zhanel G, Critchley I, Lin LY, Alvandi N. Microbiological profile of sarecycline, a novel targeted spectrum tetracycline for the treatment of acne vulgaris. *Antimicrob Agents Chemother.* 2018;63(1):e01297-18. doi: 10.1128/AAC.01297-18. PMID: 30397052; PMCID: PMC6325184.
2. Batool Z, Lomakin IB, Polikanov YS, Bunick CG. Sarecycline interferes with tRNA accommodation and tethers mRNA to the 70S ribosome. *Proc Natl Acad Sci USA.* 2020;117(34):20530-20537.
3. Graber, E. M. Treating acne with the tetracycline class of antibiotics: A review. *Dermatological Reviews.* 2021; 2:1-10.

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