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Comment on: Antibiotic resistance in dermatology: The scope of the problem and strategies to address it

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To the Editor: We applaud Shah et al's¹ efforts to raise awareness of antibiotic use in dermatology and antibiotic resistance in skin-specific organisms. Dermatologists prescribe the most antibiotics per provider² and should participate actively in antibiotic stewardship to address the major public health concern of increasing antibiotic resistance and multi-drug resistant organisms.

The authors noted that the American Academy of Dermatology acne guidelines for antibiotics recommend 3–4 month durations to limit resistance development and promote stewardship. A recent study showed standard dermatology antibiotic regimens disrupted skin microbial homeostasis in a much shorter timeframe. Twice-daily doxycycline 100mg and trimethoprim-sulfamethoxazole 160/800mg led to antibiotic resistance within 14 days in a small cohort of healthy individuals; antibiotic-resistant skin bacteria persisted to the end of the yearlong study³. Interestingly, “subantimicrobial” doses (doxycycline 20mg) also resulted in an altered skin microbiome. Emergence of doxycycline-resistant *Staphylococcus epidermidis* was dose-dependent: 20mg dosing had lower minimum inhibitory concentrations than 100mg dosing. Furthermore, in studies performed in intensive care unit and inpatient settings, 14-day antibiotic courses resulted in more multi-drug resistant organisms in patients as compared to 7-day courses⁴. Thus, antibiotic resistance develops early after antibiotic exposure, can persist for months after discontinuation, and increases with lengthening treatment durations.

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While antibiotics clearly lead to antibiotic-resistant bacteria, more data are needed to inform evidence-based treatment durations and alternative treatments. For example, few acne studies describe time to improvement after starting antibiotics, and antibiotics for cutaneous diseases are often prescribed for extended durations – from weeks for infections to months-years for inflammatory disorders². Additionally, while non-antibiotic treatment alternatives exist, more well-controlled comparative efficacy trials are needed. Evidence is essential to guide a thoughtful therapeutic approach with risk-benefit analysis.

Antibiotics in dermatologic surgery is one indication where evidence-based guidelines exist. A single dose of pre-operative prophylactic antibiotics is recommended for the high-risk indications of surgical site infections (surgeries in lower extremities and groin, wedge excision of the lip or ear, skin flaps on the nose, and skin grafting or surgeries in the setting of extensive inflammatory skin disease), infective endocarditis, and hematogenous joint infections⁵. Despite these guidelines, oral antibiotics associated with surgical visits increased 70% during 2008–2016 and prescription practices show significant US geographic variation, highlighting a need for consistent antibiotic stewardship in the surgical setting.

Ultimately, antibiotic stewardship in dermatology will require a multi-pronged approach. The specialty critically needs well-designed trials comparing alternative treatments and clarifying minimal antibiotic durations necessary for therapeutic benefit. In the meantime, individual dermatologists can be antibiotic stewards – consider non-antibiotic alternatives, limit treatment durations, use narrowest spectrum antibiotics whenever possible, and follow guidelines when available, as is the case for dermatologic surgery.

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