

## Antimicrobial susceptibility and genetic characteristics of *Propionibacterium acnes* isolated from patients with acne

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### Abstract

**Background** *Propionibacterium acnes* is an important target in acne management. Antibiotic resistance has increased, reducing its clinical efficiency. **Objective** To study the prevalence, antimicrobial susceptibility patterns, and resistance mechanisms of *P. acnes* isolated from patients with acne. **Methods** Skin swabs were collected from 83 patients. Agar dilution determined the minimum inhibitory concentrations of five antibiotics. Polymerase chain reaction and DNA sequencing were used to identify mutations. **Results** *P. acnes* was isolated in 80 of 83 patients (96%), and 27 patients had resistance to antibiotics (33.7%). The mean age was older in the antibiotic-resistant group ( $20.8 \pm 5.8$  vs.  $18.3 \pm 3.7$ ,  $P = 0.02$ ). Resistance to trimethoprim-sulfamethoxazole was 26.3%, erythromycin 12.5%, and clindamycin 7.5%. All clindamycin-resistant strains had cross-resistance to erythromycin, and 40% erythromycin-resistant strains had cross-resistance to trimethoprim-sulfamethoxazole. All strains were sensitive to tetracycline and doxycycline. The use of topical erythromycin or clindamycin was a risk factor to carry resistant strains ( $P = 0.02$ ,  $P = 0.04$ , respectively). Resistance to trimethoprim-sulfamethoxazole was associated with acne severity ( $P = 0.02$ ). Six of the 10 erythromycin-resistant strains had a mutation in the peptidyl transferase region of the 23S rRNA gene: one A2058G and five A2059G. No strain carrying mutation G2057A was found. **Conclusions** Resistance to trimethoprim-sulfamethoxazole was the most common pattern found, and further studies are required to clarify its resistance mechanism. A certain tetracycline resistance was expected, but interestingly all strains remained sensitive. Resistance to erythromycin and clindamycin were influenced using topical formulations. Mutation A2059G was related to high resistance to erythromycin. Antibiotic resistance is increasing, and new strategies are needed..