

# STUDY OF THE PREVELANCE OF ANTIBIOTIC RESISTANCE IN A SAMPLE OF EGYPTIAN ACNE PATIENTS

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## INTRODUCTION

Acne vulgaris is an inflammatory condition of the pilosebaceous unit, Pathogenesis of this disease is multifaceted, involving four inter-connected processes: inflammation, increased sebum production, hyper-keratinization of the follicular infundibulum, and proliferation of Cutibacterium acnes. Cutibacterium acnes plays a vital role in the pathogenesis of acne by activating the innate and adaptive immunity. Chemotactic factors and proinflammatory cytokines are produced by immune reactions, resulting in local inflammation and potential scarring. Given that both topical and oral antibiotics against C. acnes have been used for decades, Cutibacterium acnes resistance to used antibiotics, such as erythromycin and clindamycin has been detected with high prevalence in Mediterranean countries mainly due to antibiotic abuse.

## AIM OF THE WORK

To assess the prevalence of antibiotic resistance to macrolides, doxycycline and clindamycin in Cutibacterium acnes of acne patients attending dermatology outpatient clinic at Alexandria Main University Hospital.

## PATIENTS AND METHODS

**This is a Prospective Observational Cross Sectional study.**

**Patients:** This study included 100 patients suffering from moderate to severe acne, patients were recruited from dermatology outpatient clinic at Alexandria Main University Hospital. Fully informed consent was collected from all patients prior to the study.

**Methods:** Sterile cotton swabs were used to obtain the samples from acne lesions after decontaminating the skin with 70% alcohol. The lesions were opened aseptically in the clinic and swabbed.

### Molecular microbiological methods:

1. DNA extraction from all collected samples was performed using Qiagen DNA extraction kits according to the manufacturer's instructions.
2. Sequence-based identification of Cutibacterium acnes was performed after DNA extraction through Real-Time PCR using gene specific primers.
3. Primers specific for detection of resistance to Macrolides, Clindamycin and Doxycycline were used through Real-Time PCR to determine the resistance pattern of Cutibacterium acnes.

## RESULTS

Table 1: Demographic data (n =100)

Demographic data	No.	%
<b>Gender</b>		
Male	30	30.0
Female	70	70.0
<b>Age (years)</b>		
<20	26	26.0
20 - <25	61	61.0
≥25	13	13.0
<b>Min. – Max.</b>	19.0 – 28.0	
<b>Mean ± SD.</b>	21.20 ± 2.34	
<b>Median (IQR)</b>	20.0 (19.0 – 22.0)	
<b>Age of onset</b>		
<b>Min. – Max.</b>	13.0 – 25.0	
<b>Mean ± SD.</b>	16.33 ± 3.13	
<b>Median (IQR)</b>	15.0 (14.0 – 17.0)	
<b>Duration of the disease (years)</b>		
<b>Min. – Max.</b>	1.0 – 10.0	
<b>Mean ± SD.</b>	4.88 ± 2.13	
<b>Median (IQR)</b>	5.0 (3.0 – 6.0)	

IQR: Inter quartile range

SD: Standard deviation

This study included 100 acne patients to assess the prevalence of antibiotic resistance to macrolides, doxycycline and clindamycin in Cutibacterium acnes. Males represented 30 patients (30%) and females were 70 patients (70%). Patients age (years) ranged from 19.0 to 28.0 with a mean ± SD 21.20 ± 2.34, 26 patients (26%) were less than 20 years old, 61 patients (61%) their ages were between 20 - <25 years old and 13 patients (13%) were ≥ 25 years old. The age of onset of the disease (years) ranged from 13.0 – 25.0 years with a mean ± SD 16.33 ± 3.13. The duration of the disease (years) ranged from 1.0 to 10.0 years with a mean ± SD 4.88 ± 2.13 years (Table 1). Regarding resistance to macrolides and clindamycin, 78 patients (78%) carried C. acnes that were resistant to macrolides and clindamycin. Regarding resistance to doxycycline, 52 patients (52%) carried C. acnes that were resistant to doxycycline (table 2).

Table 2: Prevalence of resistance to macrolides, clindamycin and doxycycline (n=100)

	No.	%
<b>Resistance to macrolides and clindamycin</b>	78	78.0
<b>Resistance to doxycycline</b>	52	52.0

## CONCLUSION

- Antibiotic resistance is a global issue and antimicrobial resistance is a ticking time bomb for the world.
- Overall, antibiotics have been used for acne treatment for several decades and the antibiotic resistance of C. Acnes is a result of antibiotic use in the treatment of acne. C. acnes was more sensitive to doxycycline and showed higher resistance rates to macrolides and clindamycin, The irrational use of antibiotics for acne treatment is a problem. These results suggest that dermatologists should be more cautious in prescribing antibiotics for acne.