

Comparison Study of Some Antibiotics Sensitivity among *Staphylococcus aureus* and Coagulase-negative Staphylococci

Ali A Alhusayni¹, Falah HO AL-Khikani²

Keywords: Antibiotics sensitivity, Coagulase-negative staphylococci, *Staphylococcus aureus*.

Bengal Physician Journal (2024): 10.5005/jp-journals-10070-8028

Dear Editor,

Every year, hundreds of thousands of fatalities are brought on by bacteria that have developed widespread antibiotic resistance. The most important issue is the number of bacteria that are becoming more resistant to widely used antibiotics.^{1,2}

All types of therapeutically used antibiotics have inactivity against *staphylococcus* species. The majority of antibiotics used to treat staphylococcal infections target key bacterial functions such as DNA synthesis, translation, transcription, and cell wall formation.^{3,4} Antibiotic resistance, however, is an issue that is becoming worse, and unsuccessful treatments have high consequences in terms of both money and lives. There are several processes by which antibiotic resistance developed.^{5,6}

In the current study, a total of 60 *staphylococcus* species were isolated clinically from patients in different sites. Gram stain, colony morphology on blood agar, and biochemical tests were done for microbial identification. After growth on culture media, a subculture on mannitol salt agar (HIMEDIA, India) was done for all isolates. The are 30 isolates *Staphylococcus aureus* and 30 isolates coagulase-negative staphylococci (CoNS).

Meropenem showed low resistance for *staphylococcus* isolates 16.7% followed by both levofloxacin and azithromycin 43.3%. *Staphylococcus* spp were 63.3 and 73% resistant to ceftazidime and fosfomycin respectively. *Staphylococcus* spp showed high resistance to aztreonam at 96% (Fig. 1).

Staphylococcus aureus showed high resistance to levofloxacin at 76.7% compared to CoNS at 43.3% significantly ($p < 0.001$). As

¹Department of Microbiology, Al-Shomali General Hospital, Babylon Health Directorate, Babylon, Iraq

²Department of Medical Laboratory Technology, College of Medical Technology, The Islamic University, Najaf; Department of Microbiology, Al-Shomali General Hospital, Babylon Health Directorate, Babylon, Iraq

Corresponding Author: Falah HO AL-Khikani, Department of Medical Laboratory Technology, College of Medical Technology, The Islamic University, Najaf; Department of Microbiology, Al-Shomali General Hospital, Babylon Health Directorate, Babylon, Iraq, Phone: +964 7817307280, e-mail: falahgh38@gmail.com

How to cite this article: Alhusayni AA, AL-Khikani FHO. Comparison Study of Some Antibiotics Sensitivity among *Staphylococcus aureus* and Coagulase-negative Staphylococci. *Bengal Physician Journal* 2024;xx(x):xx-xx.

Source of support: Nil

Conflict of interest: None

well as *S. aureus* revealed high resistance to azithromycin at 60% compared to CoNS at 26.7% significantly ($p = 0.01$). Other agents such as fosfomycin, meropenem, ceftazidime, and aztreonam showed no significant differences in activity between *S. aureus* and CoNS ($p > 0.05$) (Table 1).

To conclude, levofloxacin and azithromycin are more effective against CoNS than *S. aureus* significantly ($p < 0.05$). Due to increasing resistance to *staphylococcus* species, a line of new

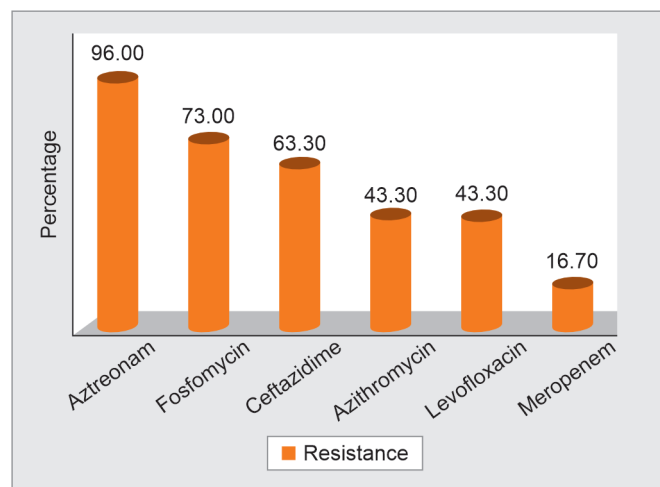


Fig. 1: Total resistance for all isolates

Table 1: Comparison of different antibiotics activity among *Staphylococcus* species

Antibiotics	Groups		Total	p-value
	<i>S. aureus</i>	CoNS		
Levofloxacin				
Sensitive	7 (23.3)	27 (90)	34 (56.7)	<0.001
Resistance	23 (76.7)	3 (10)	26 (43.3)	
Fosfomycin				
Sensitive	10 (33.3)	6 (20)	16 (26.7)	0.38
Resistance	20 (66.7)	24 (80)	44 (73.3)	
Meropenem				
Sensitive	26 (86.7)	24 (80)	50 (83.3)	0.73
Resistance	4 (13.3)	6 (20)	10 (16.7)	
Ceftazidime				
Sensitive	9 (30)	13 (43.3)	22 (36.7)	0.42
Resistance	21 (70)	17 (56.7)	38 (63.3)	

(Contd...)

Table 1: (Contd...)

Antibiotics	Groups		Total	p-value
	<i>S. aureus</i>	CoNS		
Aztreonam				
Sensitive	2 (6.7)	0 (0)	2 (3.3)	0.49
Resistance	28 (93.3)	30 (100)	58 (96.7)	
Azithromycin				
Sensitive	12 (40)	22 (73.3)	34 (56.7)	0.01
Resistance	18 (60)	8 (26.7)	26 (43.3)	

*Statistically significant at $p < 0.05$ (Chi-squared test)

therapeutic options is demanded to be explored and future research will reveal their efficacy and clinical potential against infections with *S. aureus*.

ORCID

Falah HO AL-Khikani  <https://orcid.org/0000-0002-8890-7090>

REFERENCES

- Urban-Chmiel R, Marek A, Stępień-Pyśniak D, et al. Antibiotic resistance in bacteria—A review. *Antibiotics* 2022;11(8):1079. DOI: 10.3390/antibiotics11081079.
- Shaheed TS, Barem WN, Abd FG, et al. Estimation of systemic and mucosal toll-like receptors 4 and 6 in women with breast tumor. *Journal of Medical Society* 2023;37(1):9–12. DOI: 10.4103/jms.jms_72_22.
- Al-Khikani F, Ayit A. The antibacterial action of safranin and gentian violet. *Rambam Maimonides Med J* 2022;13:e0018. DOI: 10.5041/RMMJ.10475.
- Alhusayni AA, AL-Khikani FH. Efficacy of aluminum potassium sulfate against *Staphylococcus* species in wound infections compared to meropenem and amoxycylav. *Microbes Infect Dis* 2023;Article-In-Press. DOI: 10.21608/mid.2023.225605.1574.
- Vestergaard M, Frees D, Ingmer H. Antibiotic resistance and the MRSA problem. *Microbiology Spectr* 2019;7(2). DOI: 10.1128/microbiolspec.GPP3-0057-2018.
- Al-Khikani FH, Almosawey HA, Abdullah YJ, et al. Potential antiviral properties of antifungal drugs. *Journal of the Egyptian Women's Dermatologic Society* 2020;17(3):185–186. DOI: 10.4103/JEWD.JEWD_40_20.