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Prevalence And Antibiotic Resistance Pattern Of Staphylococcus Aureus Isolated From Skin Infections

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***Abstract*— The aim of this study was to determine antimicrobial resistance profiles of Staphylococcus aureus isolates from skin infections. Out of 280 skin infection specimens, 96 (34.28%) S. aureus strains were isolated and identified. The antimicrobial resistance of 96 isolates was tested with a disc diffusion method. Almost half (47%) isolates were methicillin-sensitive Staphylococcus aureus (MSSA) while 53% were methicillin-resistant Staphylococcus aureus (MRSA). All strains were found to be susceptible to vancomycin while almost all (99%) isolates were resistant to penicillin. Results revealed that 80, 67 and 66% of the investigated isolates were resistant to tetracycline, ciprofloxacin and erythromycin, respectively, while only 16 and 19% of the isolates were resistant to amikacin and gentamicin, respectively.**

Keywords— Antibiotic resistance; *Staphylococcus aureus*; skin infections

I. INTRODUCTION

Skin infections are often caused by Staphylococci or streptococci [1]. *Staphylococcus aureus* skin infections were classified as primary or secondary. Primary infections usually occur on apparently normal skin while secondary infections arising in damaged skin [2]. *S. aureus*, a major human pathogen, has a wide variety of virulence factors and the ability to acquire resistance to various antibiotics. This potential is markedly augmented by the constant emergence of new multidrug resistant clones, making *S. aureus* a superbug [3]. *S. aureus* can cause serious infections upon invading the bloodstream or internal tissues leading to a variety of clinical manifestations ranging from relatively benign skin and soft tissue infections to severe and life-threatening systemic diseases [4].

In the clinical point of view, a major issue associated with *S. aureus* is the remarkable level of acquisition of resistance against multiple antibiotic classes, complicating treatment. This antimicrobial resistance crisis represents a serious threat to public health and the economy [5]. This work addresses the prevalence and antibiotic resistance pattern of *S. aureus* strains isolated from skin infections.

II. MATERIALS AND METHODS

A. *Culture of specimens*

Samples from each skin lesion were obtained aseptically using a sterile wet cotton swab and were inoculated on blood agar. The inoculated plates were incubated in aerobic atmosphere at 35–37°C for 24 h and subcultured on mannitol salt agar.

B. *Identification of isolated bacteria*

The suspected *Staphylococcus aureus* strains were identified based on Gram-positive cocci in clusters, β-hemolytic colonies on blood agar, catalase and coagulase production, and yellow colony surrounded by yellow zone on mannitol salt agar [6].

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C. *Antibiotic Susceptibility Testing*

The susceptibility of the isolates was tested by the disk diffusion method on Mueller-Hinton agar using the following antibiotic discs: penicillin (10 U), gentamicin (10 µg), amikacin (30 µg), erythromycin (15 µg), tetracycline (30 µg), ciprofloxacin (5 µg), levofloxacin (5 µg), clindamycin (2 µg), oxacillin (1µg), linezolid (30 µg) and vancomycin (30 µg).

III. Results

Out of 280 specimens suspected of developing skin infection, 96 (34.28%) have culture-confirmed *S. aureus* wound infections. Of these isolates, 53% were methicillin-resistant *S. aureus* (MRSA) while 47% were methicillin-sensitive *S. aureus* (MSSA). Results revealed that 100% of isolates were susceptible to vancomycin. Almost all (99%) isolates were resistant to penicillin while the vast majority (97%) were susceptible to linezolid. Resistance to tetracycline, erythromycin, ciprofloxacin and levofloxacin was the most common resistance pattern among the investigated isolates. Results revealed that 80, 67 and 66% of the investigated isolates were resistant to tetracycline, ciprofloxacin and erythromycin, respectively. Results showed the high susceptibility of *S. aureus* isolates to amikacin and gentamicin. Only 16 and 19% of investigated isolates were resistant to amikacin and gentamicin, respectively (Fig. 1).

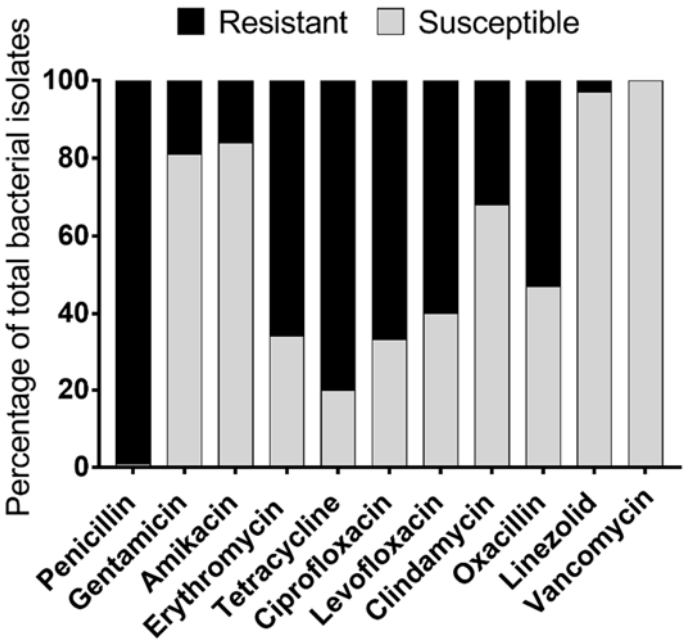

Fig. 1. Antibiotics resistance profile of *S. aureus* isolated from skin infections.

IV. Conclusion

This study revealed high prevalence of MRSA strains and most of *S. aureus* strains especially MRSA strains were multidrug-resistant and no isolate exhibited resistance to vancomycin. The least effective antibiotics were penicillin and tetracycline.

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