

## **The Antibiotic Profiles of Local *Staphylococcus aureus* Isolated from Pus and Wound Infections**

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### **Structured Abstract**

**Background:** *Staphylococcus aureus* is a well-known pathogen responsible for pus and wound infections. The emergence of antibiotic-resistant strains, especially methicillin-resistant *S. aureus* (MRSA), complicates effective treatment. In Malaysia, limited data on the resistance profiles of local isolates hinders accurate therapeutic decisions. This study aimed to isolate and identify local *S. aureus* from pus and wound infections and determine their antibiotic resistance patterns.

**Methods:** Fifteen pus and wound samples were collected and cultured on Mannitol Salt Agar (MSA) to isolate *S. aureus*. The presumptive colonies were subjected to Gram staining, catalase test, and coagulase test for phenotypic confirmation. Antibiotic susceptibility testing (AST) was performed using the Kirby-Bauer disk diffusion method against six antibiotics, which include cefoxitin (30 µg), clindamycin (2 µg), gentamicin (10 µg), rifampicin (5 µg), tetracycline (30 µg), and vancomycin (30 µg). The two most resistant isolates, SA1 and SA2, were subjected to 16S rRNA gene sequencing for molecular identification

**Results:** Eight isolates exhibited typical *S. aureus* features: growth on MSA with yellow pigmentation, Gram-positive cocci in clusters, and positive catalase and coagulase reactions. AST revealed 100.0% sensitivity to gentamicin and tetracycline. Cefoxitin had the highest resistance (62.5%), suggesting MRSA presence. Resistance to rifampicin was 50.0%, while clindamycin and vancomycin showed the lowest resistance (37.5%). Multidrug resistance (MDR) was found in three isolates (SA1, SA2, SA10), all resistant to clindamycin, rifampicin, and vancomycin. 16S rRNA sequencing confirmed SA1 as *S. aureus* strain 14733 (99.38% similarity) and SA2 as *S. aureus* strain USA300 (99.25%).

**Conclusion:** This study confirms the occurrence of MRSA and MDR *S. aureus* in local pus and wound infections. These findings support the need for continuous monitoring and informed antibiotic use in clinical settings to combat antimicrobial resistance.

**Keywords:** *Staphylococcus aureus*, MRSA, Antibiotic Resistance, 16S rRNA Gene, Pus and Wound Infections

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