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Antimicrobial susceptibility patterns of Staphylococcus aureus causing cellulitis among adult patients attending clinical services at Kiruddu Referral Hospital, Kampala. A cross-sectional study.

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ABSTRACT

Background

Staphylococcus aureus is responsible for most cases of cellulitis infections. Cellulitis is the most common bacterial infection on the skin surfaces in humans all over the world. The study aims to investigate the AST patterns of Staphylococcus aureus that cause cellulitis in adult patients.

Methods

A cross-sectional study analyzed 279 wound swabs from cellulitis patients at Kiruddu Referral Hospital, Kampala. Samples were cultured on Mannitol Salt, Blood, and MacConkey Agars. Staphylococcus aureus was identified by Gram stain, catalase, and coagulase tests; other isolates (Streptococcus pyogenes, Escherichia coli, Klebsiella pneumoniae) were confirmed biochemically. Antimicrobial susceptibility was determined using Kirby-Bauer disk diffusion on Mueller-Hinton agar, interpreted per CLSI (2023) guidelines. Susceptibility frequencies were calculated with Microsoft Excel.

Results

Among 279 patients, 56.3% of the participants were female, and 31.5% were aged 36–45 years. 50.5% were married, and 30.5% had completed secondary education. Staphylococcus aureus was the predominant pathogen (56.6%, n=158). Of these, 43.7% were methicillin-resistant (MRSA). Susceptibility to key antibiotics was: vancomycin (96.8%), quinupristin/dalfopristin (81.6%), clindamycin (73.4%), and trimethoprim-sulfamethoxazole (64.6%). Streptococcus pyogenes showed high penicillin susceptibility (90.0%), while Gram-negative isolates exhibited significant resistance to commonly used antibiotics.

Conclusion

High MRSA prevalence and significant antibiotic resistance were found, necessitating routine susceptibility testing and strengthened stewardship to guide effective cellulitis treatment

Recommendation

The Ministry of Health should incorporate TB LAM Ag test strips into the national HIV/TB diagnostic guidelines, especially for patients with advanced immunosuppression.

***Keywords**: Antimicrobial Susceptibility Profiles, Staphylococcus aureus, Cellulitis, Adults*
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Background

Staphylococcus aureus is a bacterial pathogen responsible for skin and soft tissue infections (SSTIs) in dermatology patients caused by methicillin-susceptible and methicillin-resistant S. aureus (MSSA-MRSA). According to Brown and Hood Watson (2025), underlying health conditions such as diabetes, venous insufficiency, peripheral arterial disease,

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and lymphedema elevate an individual's susceptibility to cellulitis.

Globally, the study done on S. aureus from STTIs patients from Istanbul, Turkey, where microbiological data of 431 patients were examined, showed that A total of 333 isolates (77.3%) were identified as MSSA, with 98 (22.7%) being MRSA. Patients with MRSA infections experienced significantly longer hospital stays and antibiotic treatment durations (Yakut et al., 2024).

A study was conducted in a South African tertiary public hospital in 2021 using an adapted data collection tool. A total of 67 patient files were reviewed. Among the patients with SSTIs, the most common comorbidities were hypertension (22.4%) and chronic osteomyelitis (13.4%). According to the data, the predominant type of diagnosed SSTIs was surgical site infections, which made up 35.1% of cases. Wound infections and large abscesses 23% and 16.2% of diagnoses, respectively. Blood cultures analysis was performed on 40.3% of patients, isolated Staphylococcus aureus (32.7%) and Enterococcus spp. (21.2%) as the predominant pathogens.

In Uganda, among patients with skin infections, Staphylococcus aureus was the most frequently isolated pathogen, accounting for 67.4% of cases (31/46), with a high prevalence of Methicillin-Resistant Staphylococcus aureus (MRSA), making up 64.5% of the S. aureus isolates (20/31). Among the 243 patients monitored, 143 (58.9%) died in the hospital, with an average hospital stay of 4.9 days (SD 5.5) for those who passed away, compared to 10.2 days (SD 7.6) for those discharged alive. No study participants required ICU-level care (Nyesiga et al., 2022). The study aims to investigate the antimicrobial susceptibility patterns of Staphylococcus aureus causing cellulitis among adult patients attending clinical services at Kiruddu Referral Hospital, Kampala.

Methodology

Study Design

A Cross-sectional experimental study to determine the antimicrobial susceptibility patterns of *Staphylococcus aureus* in patients attending clinical services at Kiruddu Referral Hospital, located in Kampala, Uganda, was conducted for a period of 5 months from February 2025 to June 2025.

Study Area

The selected location was at Kiruddu Referral Hospital, located in Kampala, Uganda, where cellulitis patients were numerous, and therefore, it was the study's site.

Study population

The study population was patients diagnosed with cellulitis at Kiruddu Referral Hospital, located in Kampala, Uganda.

Sample Size Determination

The sample size was determined using Krejcie and Morgan's formula (Bukhari, 2021), suitable for finite populations. Given the population size (N) of 1,014, the sample size (S) would be calculated as follows:

$S = X\,2 \cdot N \cdot P \cdot (1 - P)/d\,2 \cdot (N - 1) + X\,2 \cdot P \cdot (1 - P)$

Where:

X 2 = Chi-square value (3.841 for 1 degree of freedom at 0.05 confidence level)

N = Population size (1,014)

P = Population proportion (assumed to be 0.5 for maximum sample size); therefore, the prevalence used was P = 0.5, which was a standard assumption used when the true prevalence was unknown. d = Degree of accuracy (0.05)

Calculation: $S = 3.841 \cdot 1014 \cdot 0.5 \cdot 0.5/\ 0.0025 \cdot 1013 + 3.841 \cdot 0.25$

S= 0.0025·1013+3.841·0.25/3.841·1014·0.5·0.5

$S = 973.545/3.4925$

S≈279

Thus, the sample size was determined to be approximately 279 hospitalized patients.

Inclusion Criteria

The study included swab samples from adult patients with cellulitis attending Kiruddu Referral Hospital, Kampala.

Exclusion Criteria

The study excluded swab samples that would be negative for *S. aureus* after both microscopy and Biochemical tests were done from adult patients with cellulitis attending Kiruddu Referral Hospital, Kampala.

Units of Analysis

The units of analysis were skin swab samples collected from patients diagnosed with cellulitis at the Kiruddu Referral Hospital, located in Kampala, Uganda.

Sampling Technique and Collection

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Simple random sampling was used to select patients diagnosed with cellulitis for swab sample collection. Swab samples were aseptically collected from the patients using sterile swabs and transported immediately to the microbiology laboratory within 24 hours.

Media Selection

The ready-to-use media included Mannitol Salt Agar, Bile Esculin Agar, Nutrient Agar, and MacConkey agar. Mueller-Hinton agar was used for sensitivity testing.

Isolation and Culture of *Staphylococcus aureus*

Swab samples were collected and examined microscopically after the Gram staining technique under a microscope. Samples showed Gram's reactions were included in the study and cultured onto Mannitol Salt Agar, Bile Esculin Agar, and MacConkey agar. The plates were incubated at 37°C overnight.

Identification of *Staphylococcus aureus*

Identification of isolates was preliminary by recording colony and morphological characteristics using Bergey's manual of determinative bacteriology.

The bacteriological techniques that were used included the Gram staining technique to differentiate between Gram-positive and Gram-negative bacteria, Biochemical tests to identify the isolated bacteria, and Antimicrobial susceptibility testing to determine the susceptibility of the bacteria to selected antibiotics.

Data Collection Methods

Quantitative data were collected through laboratory methods, including culture and biochemical identification tests.

Data Collection Tools

A laboratory notebook was used for capturing the unique identification numbers assigned to the collected samples, recording laboratory results, and documenting any modifications made to the analytical protocol.

Data Analysis Methods

Data was analyzed using the Microsoft Excel 2016 software application, and the findings were presented in tables. Figures and graphs.

Quality Assurance Aspects

Sample Collection and Transportation

Swab samples were aseptically collected and transported in clean containers using a carrier box.

Pre-analytical Aspects

Samples were assigned unique numbers and registered upon reception.

Bench tops were disinfected with 70% ethanol before and after work.

Samples were handled with protective gloves.

Analytical Aspects

Aseptic techniques were employed during sample preparation and inoculation.

Controls were included during Gram staining and biochemical tests to ensure accuracy and reliability.

Standard operating procedures were followed.

Calibrated instruments were used in all analytical procedures.

Reagents for Gram staining were filtered before use.

Inoculation of the media was done in a biosafety cabinet.

Prepared media and API 20E kits were stored at recommended temperatures of (2-8°C).

Post-analytical Aspects

Interpretation of results was performed as documented in the analytical procedure.

Data was recorded both manually and electronically.

Ethical Considerations

Ethical clearance was obtained from the Research Ethics and Review Committee at the University of Kisubi. The confidentiality of patient information was maintained by assigning unique laboratory-generated identification numbers to samples.

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Results

Socio-demographic Characteristics of Respondents

Table 1: Socio-demographic Characteristics of Respondents (n = 279)

Variable	Category	Frequency (n)	Percentage (%)
Sex of Respondent	Male	122	43.7%
	Female	157	56.3%
Age Bracket	18–25 years	38	13.6%
	26–35 years	72	25.8%
	36–45 years	88	31.5%
	46 years and above	81	29.1%
Marital Status	Single	86	30.8%
	Married	141	50.5%
	Divorced/Separated	28	10.0%
	Widowed	24	8.7%
Education Level	No formal education	41	14.7%
	Primary	76	27.2%
	Secondary	85	30.5%
	Tertiary	45	16.1%
	University Degree	32	11.5%
Occupation	Civil servant	36	12.9%
	Peasant	79	28.3%
	Self-employed	71	25.5%
	Unemployed	49	17.6%
	Student	44	15.8%

Table 1 indicates that gender representation of the respondents consisted of more females at 56.3% (n=157) and slightly fewer males at 43.7% (n=122). This seems to suggest that the sampling method influenced the study sample demographics towards women, and the study subject had greater relevance to, or interest from, female respondents.

The respondents aged 36–45 years also represented the majority of the sample (31.5%, n=88), suggesting that some middle-aged individuals occupy their time with the issues being considered in this study. Of note, the lowest number of respondents for this study was collected from individuals aged 18–25 years (13.6%, n=38); this may suggest concern with these issues, or there may be limited access to these issues due to the ages of respondents.

In addition, nearly half of the respondents (50.5%, n=141) identified themselves as married, again suggesting that marital status may have some relevance to the issues being examined in conjunction with the study. In contrast, the fewest number of respondents (8.7%, n=24) identified themselves as widowed, suggesting there was very little presence of widowed respondents who participated in the study.

Also, the highest level of educational attainment was secondary education, reported by 30.5% (n=85) of respondents. This indicates that most people in the study reported some level of basic formal education. The lowest proportion was people with a university degree, representing 11.5% (n=32), which implies fewer participants reported having advanced forms of academic qualifications.

Finally, for occupation, the largest occupational grouping was peasant, who comprised 28.3% (n=79) of the respondents. This indicates a strong representation from those involved in informal or subsistence farming. The

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smallest occupational group was civil servants, making up only 12.9% (n=36), which suggests either a smaller population presence or poorer participation in the study.

Isolation and identification of *Staphylococcus aureus* and other organisms that cause cellulitis

This section reports the results on the isolation and identification of Staphylococcus aureus and other bacteria from wound swabs taken from adult patients with suspected cellulitis at Kiruddu Referral Hospital, Kampala.

A total of 279 wound swab samples were obtained with sterile cotton-tipped applicators and under aseptic conditions. The healthcare workers rolled the swabs over the affected area to pick up any viable samples and placed them into sterile media for transport. The samples were transported to the Microbiology laboratory within two hours from the time of collection for timely processing and maximum recovery of the viable organisms.

Culture and primary isolation

The primary isolation took place using three culture media;

Mannitol Salt Agar (MSA) was used to presumptively isolate Staphylococcus aureus.

Blood Agar (BA) is used to grow fastidious and all Gram-positive organisms, including Streptococcus spp.

MacConkey Agar (MAC) is employed to selectively isolate Gram-negative bacilli, including Escherichia coli and Klebsiella spp.

Colonial Characteristics

On MSA, 158, a golden-yellow colony with mannitol fermentation (yellow zone) was observed, indicative of S. aureus.

On Blood Agar, small translucent colonies with beta-hemolysis were seen, suggestive of Streptococcus pyogenes.

On MacConkey, pink (lactose-fermenting) colonies and mucoid colonies were present, suggesting Escherichia coli, and Klebsiella pneumoniae, respectively.

Sub culturing

Representative colonies from each plate were subcultured onto Nutrient Agar (NA) to isolate pure colonies for Gram staining and biochemical characterization.

Microscopic examination and Gram staining

The presumptive colonies were then subjected to Gram staining, and the 199 isolates were Gram-positive cocci, and the remaining 80 were Gram-negative. The samples were then subjected to the different biochemical tests to identify the isolates.

Biochemical Tests and Organism Identification

All isolates were characterized by standard biochemical tests for final identification. The following organisms were identified as Staphylococcus aureus, Streptococcus pyogenes, Escherichia coli, and Klebsiella pneumoniae:

Staphylococcus aureus (n = 158, 56.63%). The isolates were coagulase-positive and catalase-positive and showed yellow colonies on Malt-Salt Agar, supporting mannitol fermentation. All isolates were confirmed as Staphylococcus aureus with Gram-positive cocci in clusters, catalase positive, and coagulase positive.

Streptococcus pyogenes (n = 42, 15.05%): The isolates were Gram-positive cocci in chains, catalase-negative, and were beta-hemolytic in Blood Agar. The bacitracin sensitivity test and the PYR positive confirmed the isolate's identity as S. pyogenes.

Escherichia coli (n = 39, 13.98%): The isolates were pink colonies on MacConkey Agar and were Gram-negative rods, Indole-positive, Methyl Red-positive, Voges-Proskauer-negative, Citrate-negative (IMViC: ++--). Also all isolates confirmed with all the feature combinations for E. coli.

Klebsiella pneumoniae (n = 40, 14.34%): The isolates were mucoid lactose-fermenting colonies on MacConkey, Gram-negative rods, Indole-negative, Methyl Red-negative, Voges-Proskauer-positive, Citrate-positive (IMViC: --++), urease-positive, and non-motile, with the combination of features supporting K. pneumonia.

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Table 2: Frequency of bacterial isolates identified (N = 279)

Organism	Frequency (n)	Percentage (%)
Staphylococcus aureus	158	56.6%
Streptococcus pyogenes	41	14.7%
Escherichia coli	42	15.1%
Klebsiella pneumoniae	38	13.6%
Total	279	100%

Gram-positive, Gram-negative sample tests, lactose-fermenting

Table 2 showed *Staphylococcus aureus* was the most commonly isolated pathogen at 56.63% and *Escherichia coli* was the least common pathogen isolated at 13.98%. There were both Gram-positive and Gram-negative organisms isolated, showing the diversity of isolates involved in cellulitis in adult patients at Kiruddu Referral Hospital.

Antimicrobial Susceptibility Patterns of *Staphylococcus aureus* Isolates

Susceptibility testing was performed by the Kirby-Bauer disc diffusion technique, following Clinical and Laboratory Standards Institute (CLSI, 2023). In brief, Mueller-Hinton Agar plates were made, and each isolate was standardized and adjusted to the 0.5 McFarland standard turbidity and was evenly distributed on the surface of the agar plate using a sterile applicator.

Antibiotic discs were aseptically placed on the agar surface, and plates were incubated at 37°C for 18-24 hours. Zones of inhibition were measured in millimeters using a calibrated ruler, and categorised for susceptibility as Sensitive (S), Intermediate (I), or Resistant (R) using CLSI breakpoints.

Antibiotics tested among others were the following:

- Vancomycin (VA)
- Oxacillin (OX) – MRSA Screening
- Clindamycin (DA)
- Trimethoprim/Sulfamethoxazole (SXT)
- Quinupristin/dalfopristin (QD)

Table 3: Antimicrobial Susceptibility Patterns of Staphylococcus aureus (n = 158)

Antibiotic	Sensitive (S)	Intermediate (I)	Resistant (R)
Vancomycin (VA)	153 (96.8%)	5 (3.2%)	0 (0.0%)
Oxacillin (OX)	78 (49.4%)	11 (7.0%)	69 (43.7%)
Clindamycin (DA)	116 (73.4%)	18 (11.4%)	24 (15.2%)
Trimethoprim/Sulfamethoxazole (SXT)	102 (64.6%)	22 (13.9%)	34 (21.5%)
Quinupristin/Dalfopristin (QD)	129 (81.6%)	13 (8.2%)	16 (10.1%)

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Figure 1: Showing the antimicrobial susceptibility patterns of Staphylococcus aureus isolates to five antibiotics:

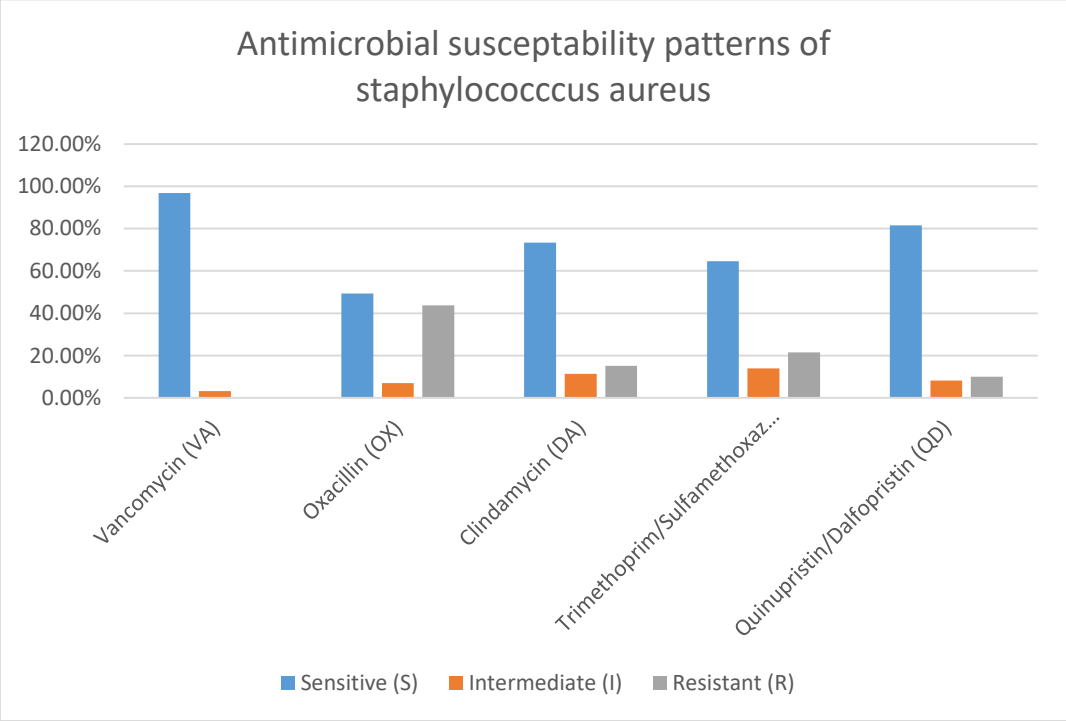

Table 2 and Figure 1 showed that vancomycin showed the highest sensitivity (96.8%) and no resistance. Oxacillin demonstrated the highest resistance rate (43.7%), thus indicating that MRSA is present. Clindamycin, Trimethoprim/Sulfamethoxazole (SXT), and Quinupristin/Dalfopristin (QD) had moderate (to high) sensitivity with Clindamycin at 73.4%, SXT at 64.6% and QD at 81.6%.

Table 4: Antimicrobial susceptibility patterns of other bacterial isolates (n = 121)

Organism	Antibiotic	Sensitive n (%)	Resistant n (%)
Streptococcus pyogenes	**Penicillin**	**36 (90.0)**	**4 (10.0)**
	Erythromycin	**30 (75.0)**	**10 (25.0)**
	Clindamycin	**32 (80.0)**	**8 (20.0)**
Escherichia coli	**Ciprofloxacin**	**29 (70.7)**	**12 (29.3)**
	Gentamicin	**27 (65.9)**	**14 (34.1)**
	Ceftriaxone	**25 (61.0)**	**16 (39.0)**
Klebsiella pneumoniae	**Ciprofloxacin**	**28 (70.0)**	**12 (30.0)**
	Gentamicin	**25 (62.5)**	**15 (37.5)**
	Ceftriaxone	**26 (65.0)**	**14 (35.0)**

Streptococcus pyogenes showed the highest susceptibility to Penicillin G (97.6%) and the lowest in Erythromycin 22.0%. E. coli isolates exhibited good sensitivity to Ciprofloxacin (74.36%) and Gentamicin (69.23%), but very high

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resistance to Ampicillin (71.79%), which was consistent with known resistance patterns with Gram-negative infections.

Klebsiella pneumoniae isolates were highly resistant to Ampicillin (77.50%) and Ceftriaxone (55.00%), but they were sensitive to Ciprofloxacin and Gentamicin, which are good first-line options.

Methicillin Resistance Profile

69 (43.7%) of the isolates were Oxacillin-resistant and thus Patel (2009) categorized MRSA. The remaining 89 (56.3%) isolates were Methicillin-Sensitive Staphylococcus aureus (MSSA).

Table 5. Methicillin Resistance Profile

Resistance Category	Frequency (n)	Percentage (%)
MRSA (Oxacillin-Resistant)	69	43.7%
MSSA (Oxacillin-Sensitive)	89	56.3%

These results revealed very high antimicrobial resistance burdens, especially regarding the emergence of MRSA, and demonstrated that access to effective treatments would be very difficult! High susceptibility to Vancomycin demonstrates its continued role as a last-line therapy for MRSA disease. However, the moderate antibiotic sensitivity results in other treatment alternatives available, such as Clindamycin and SXT, which means vigilance for susceptibility testing using surveillance programs, or adopting local evidence-based antibiotic stewardship programs is required.

The alarming presence of MRSA in 43.7% of the isolates is indeed a worldwide pattern of emerging resistance in skin and soft tissue infections, calling for the urgency of infection control policies, public health interventions, rational antibiotic prescribing practices, and simpler healthcare system access if Indonesia and other similar countries are to improve healthcare outcomes and reduce burdens.

Discussion

Socio-Demographic Characteristics of Respondents

This study documented that the females constituted 56.3% (n = 157) of the patient cohort and were more represented than males. This pattern likely reflects vulnerabilities related to gender, which stemmed from risk behaviors associated with household roles and caregiving in their communities. It can theoretically expose females to skin breaches and environmental hazards. Similar surveys in East Africa, including Uganda and Tanzania, report a female predominance of 79% of clinic populations for various infections, including skin and soft tissue infections (Keenan et al., 2023). A national AMR surveillance program in Uganda, this study noted, also found S. aureus derived from females having higher resistance rates, not only indicating higher prevalence, but potentially also suggesting differences in antimicrobial exposure or antimicrobial usage (Bazira et al., 2025). These accounts warrant thinking about gender-responsive public health approaches that address equitable access for sick women and productive messaging about early detection, wound care, and antibiotic responsibility.

Most respondents were in the age range of 36–45 years (31.5%, n = 88), with significant proportions falling in the 26–35 and 46+ year ranges. People in these age ranges are economically active and likely to be fulfilling household, work, or caring responsibilities—all of which often include injury, heavy lifting, and repetitive strain exposure that may amplify their risk of cellulitis. The age distribution was similar when comparing data from African cellulitis studies; for example, the patient profiles in Kenyan cellulitis studies have mean ages close to those of this outbreak efficacy study (Nyasinga et al., 2020). The active and responsible stage of life reinforces the need for integrated community approaches (e.g., education on routine foot and skin care, occupational community coverage, and community-based disease screening) during these age ranges.

About half of respondents reported secondary education (30.5%, n = 85), 27.2% primary education, 16.1% post-secondary education, and 11.5% university-level education. Education levels influence health-seeking behavior and health literacy, often leading to heightened awareness—but they may also be associated with increased self-medication and improper antibiotic use related to confidence (Popoola

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et al., 2024). In Uganda, higher education does not necessarily lead to prudent antibiotic use, with students of a tertiary education status being less likely to self-medicate (Keenan et al., 2023). When compared with graduates in Nigeria, who were self-medicating at a prevalence of 47.7% despite a tertiary level of education (Popoola et al., 2024). These inconsistencies may further highlight the need for educational interventions that are targeted not only to increase knowledge but also to address confidence-based misuse, reinforce adherence to the prescription course, and advocate for cautious antibiotic use regardless of level of education.

Isolation and Identification of *Staphylococcus aureus*

More than half (56.6%) of the wound swab samples confirmed Staphylococcus aureus; this establishes S. aureus as the main pathogen leading to cellulitis among the Kiruddu cohort. The isolation rates were comparable to other studies done regionally; for instance, reported frequencies of S. aureus isolation (52.6%) reported for skin and soft tissue infections in Kenya (Nyasinga et al., 2020). And this emphasizes the bacterium relationship. Cross-sectional findings located in nearby East Africa also endorse the bacterium's prevailing role in regional epidemiology (Nyasinga et al., 2024). The samples can be cultured on Mannitol Salt Agar, and positive samples formed brighter golden-yellow colonies, indicating that mannitol was fermented. Following this, Gram staining indicated Gram-positive cocci were present in clusters; these colonies were then biochemically confirmed using API 20E, which was a stable approach and continues to be reported in microbiological studies (Muwonge et al., 2025). The subsequent biochemically confirmed process adds great value and increases diagnostic rate by reducing misclassification possibilities, but additionally highlights the need for targeted diagnostics to allow appropriate antibiotic stewardship during engagement with cellulitis in a clinical scenario.

Antimicrobial susceptibility patterns *of Staphylococcus aureus* isolates

Antimicrobial susceptibility testing shows a very high susceptibility to vancomycin (96.8%). This is an important finding, as vancomycin remains the treatment of choice for MRSA infections. The same meta-analyses, which included studies done in Africa, also demonstrated vancomycin resistance <6%, giving the findings even more credibility at the local level (Ejaz et al., 2023). By comparison, oxacillin resistance was 43.7%, indicating substantial MRSA presence in line with the regional prevalence rates of 40–60% for MRSA colonization and the established onset of disease (Azzam et al., 2025). This documents the substantial presence of MRSA in the population and has consequent implications for clinical management, such that empiric and conditional therapies either with vancomycin or quinupristin/dalfopristin should remain as first-line agents. This is of particular significance when considering those states in which microbiological culture may not be a viable option due to resource constraints that delay treatment. This study found clindamycin (73.4%) and TMP-SMX (64.6%) to have moderate susceptibility rates comparable with the data from unstaged outpatient clinical settings in Kampala (~70%) (Carrel et al., 2024), warranting their conditional use. Interestingly, quinupristin/dalfopristin had an 81.6% efficacy and could serve as a practical, albeit rarely available alternative, for cases that cannot tolerate the pathway through vancomycin.

Altogether, these antimicrobial resistance patterns reinforce that treatments should be flexible and dynamic in local settings, and use local AST data to ensure clinical effectiveness in combating resistance.

Conclusion

The results of this research indicate the complex problem of cellulitis management at Kiruddu Referral Hospital. The study found that the demographic profile of the patients studied, which was comprised mainly of middle-aged women with secondary education and social responsibilities as wives, points to a population cohort whose domestic and contractual roles predispose them to skin injuries and delayed health-seeking behaviors.

Microbiologically, the data produced in this study shows that Staphylococcus aureus was the number one organism isolated, with over half of all wound cultures producing the organism, while all isolates remained sensitive to vancomycin (96.8%), despite 43.9% of isolates showing oxacillin-resistance (MRSA). Moderately sensitive to clindamycin and TMP-SMX, while quinupristin/dalfopristin remains promising in demonstrating effectiveness, it illustrates both the promise and peril of restricted modes of effective agents.

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Recommendations

The Ministry of Health should take action to amend national guidelines regarding skin and soft tissue infections and include MRSA-active agents, e.g., vancomycin, and quinupristin/ dalfopristin, as first-line options for treatment of cellulitis, with regular review based on regional AMR data. Routine AMR epidemiology and cellulitis surveillance should become part of the planned national action program to ensure procurement, training, and policy are in line with developing resistance patterns. The actions will harmonize empirical treatment in Uganda and protect effective antibiotics.

At the same time, the hospital needs to expand its microbiological capacity to buy supplies such as culture media, biochemical kits, and train staff to perform routine wound cultures/susceptibility testing. Quick turnaround of AST results and streamlined communications between the laboratory and the clinical teams will facilitate appropriate evidence-based therapy. Improved laboratory diagnostics will facilitate reduced reliance on empirical regimens and have a positive impact on patient outcomes.

Data availability

Data was available upon request

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God's blessings upon you all!

List of abbreviations

EUCAST: European Committee on Antimicrobial Susceptibility Testing
MRSA: Methicillin-Resistant Staphylococcus aureus
MDRSA: Multi-Drug-Resistant Staphylococcus Aureus
MDR: Multi-Drug Resistance
MSA: Mannitol Salt Agar
NA: Nutrient Agar
SEA: Staphylococcal enterotoxin A
SEB: Staphylococcal enterotoxin B
S. aureus: Staphylococcus aureus
SE: Staphylococcus enterotoxins
WHO: World Health Organization
HIV: Human Immuno Virus
TB: Tuberculosis
SSTIs: Skin and Soft Tissue Infections
ICU: Intensive Care Unit
BA: Blood Agar

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Conflict of interest

The author declares no conflict of interest

Author Biography

Jorome Nteziyaremye is a student at the University of Kisubi, pursuing a degree in biomedical laboratory technology

Author contributions

Jorome Nteziyaremye was the author, Mr. Habert Mabonga and Mr.James Kasozi were the supervisors, at Kisubi University

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