

Comparative Analysis Of Nasal Carriage Antibiotic Resistance *Staphylococcus Aureus* Isolated From Hospitalized And Non-Hospitalized Patients Within Urua Akpan Community

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Abstract

The comparative analysis of nasal carriage antibiotic resistance of *Staphylococcus aureus* isolated from hospitalized and non-hospitalized patients within Urua Akpan community was carried out using standard bacteriological procedures. The results revealed staphylococcal count from hospitalized patients which ranged from 17 to 105 colonies per swab and 4 to 16 colonies per swab for non-hospitalized patients, with no Staphylococcal count in non-hospitalized patients swab sample 1 (NPH₁) and swab sample 8 (NPH₈). The frequency and percentage of occurrence of *S. aureus* from hospitalized patients revealed highest prevalence from HP₆ as 9(17.7%), HP₉ 8(15.8%), HP₃ 7(13.7%), HP₅ 6(11.8%), HP₄ recorded 5(9.8%), HP₇ and HP₁ had 4(7.8%) each, HP₂ and HP₈ indicated 3(5.9%) each, while sample 10 HP₁₀ recorded 2(3.9%) as the least. Non-hospitalized patients revealed low prevalence of *S. aureus* with sample 7 (NHP₆) recorded the highest frequency and percentage of occurrence of 6(25.0%), NHP₁₀ 5(20.8%), NHP₄ 4(16.7%), NHP₂ 3(12.5%), NHP₅ and NHP₉ 2(8.3%) each, NHP₃ and NHP₆ indicated 1(4.2%) each, while HP₁ and HP₈ recorded no frequency and percentage of occurrence. The antibiotic susceptibility pattern of *Staphylococcus aureus* against ofloxacin antibiotics with zone of inhibition of hospitalized patients one (HP₁) was 24mm at concentration of 90%, 19mm at 70% and 18mm at 50%. *Staphylococcus aureus* of (HP₂) was 20mm and 18mm at concentration of 90% and 70%, HP₄ was sensitive to ofloxacin of 25mm at concentration of 90%, 20mm at 70%, and 18mm at 50%. HP₈ was 23mm and 18mm at 90% and 70% concentration. HP₃ was 18mm, HP₆ 19mm, HP₇ 20mm. Non-hospitalized patients swap samples revealed *Staphylococcus aureus* sensitive to ofloxacin at all concentrations, with highest zone of inhibition recorded in non-hospitalized patient swab sample four NHP₄ which ranged from 19-35mm, NHP₃ ranged from 18-31 mm, NHP₆ 19 - 32 mm, NHP₇ 18-31mm, NHP₁₀ 18-30mm, NHP₉ 18-26 mm, NHP₅ and NHP₂ had 17-26 mm and 18-29mm. The resistance rate among hospitalized patients at concentration of 50% and 70% are much higher than those in non-hospitalized patients.

Keywords: *Staphylococcus aureus*, antibiotic resistance, hospitalized patients, non-hospitalized patients, nasal carriage, clinical isolates.

1. INTRODUCTION

Staphylococcus aureus is a common microorganism found in the human body and is associated with various pathological conditions. Its pathogenicity is multifaceted, encompassing resistance to antimicrobial drugs and a high proficiency for biofilm formation (Krismer and Peschel, 2011). *Staphylococcus aureus* is a major pathogen in nosocomial and community-acquired infections. Antibiotic-resistant *Staphylococcus aureus* is now the main source of community-acquired infections among individuals who have not been exposed to healthcare environments and its colonizes approximately 30% of the human population (Krismer and Peschel, 2011). Nasal colonization by this bacterium can lead to infections such as cellulitis, endocarditis, impetigo, osteomyelitis, pneumonia, septicemia, and toxic shock syndrome (TSS) (Nosheen *et al.*, 2017). The nasal carriage of *S. aureus* is influenced by various risk and demographic factors, including age, gender, immune system competency, ethnicity, chronic diseases, living conditions, and behavioral patterns (Sivaraman *et al.*, 2009).

Individuals who encounter a colonized patient or household members are at an increased risk of becoming colonized themselves (Fritz *et al.*, 2009). Antimicrobial resistance (AMR) presents a significant global challenge due to the rapid increase in infections caused by resistant microbes and the limited development of new antimicrobial medications (Prestinaci *et al.*, 2015). The emergence of multi-drugs resistant (MDR) strains of *S. aureus*, specifically methicillin-resistant *Staphylococcus aureus* (MRSA) has heightened concerns about the necessity for judicious antibiotic use to prevent the spread of these resistant strains (Bruzzeze *et al.*, 2016).

Risk factors for methicillin-resistant *Staphylococcus aureus* (MRSA) infection include the overuse of antimicrobial agents, hospitalization, close contact with infected or colonized individuals, and various medical conditions. Additional risk factors comprise diabetes, advanced age, the presence of indwelling devices, intravenous drug use, and immune-compromised states. Understanding the modes of transmission, colonization persistence, and antimicrobial patterns is crucial for developing effective prevention and control measures (Okamo *et al.*, 2016). Health care giver, visitors and non-hospitalized individual frequently interact with hospitalized patients and health personnel who may be colonized by *S. aureus*. The sharing of personal items and suboptimal sanitary conditions within these hospital environments may raise significant public health concerns. This is particularly alarming because hospital environment can serve as reservoirs for the transmission of resistant bacteria (Fritz *et al.*, 2009). *S. aureus* strains have developed resistance to β -lactam antibiotics, including MRSA. The organism acquires resistance through the insertion

of the *mecA* gene at a precise location on its chromosome, and the *mecA* encodes an alternative penicillin-binding protein with a low affinity for semisynthetic drugs, such as methicillin, nafcillin, and oxacillin (Lu *et al.*, 2008).

MRSA strains spread quickly in vulnerable hospitalized (exposed) and healthy non-exposed individuals, profoundly changing the current therapeutic options for the prevention and treatment of *staphylococcal* infections (Sadar and Bradley, 2008). Healthy carrier act as a reservoir for the spread of *S. aureus* to uncolonized susceptible patients. Besides, the chances of the transmission of MRSA from the medical care giver carriers to the community are a great hazard. Hospital staff, are among the groups living in crowded and antibiotic expose conditions, which could make them more vulnerable to inadequate care and possibly at higher risk for MRSA colonization. However, little is known about nasal carriage of other antibiotics resistance *Staphylococcus aureus* (ARSA) among hospitalized and non-hospitalized patients (Askarian *et al.*, 2009). Therefore, this study aimed to assess *Staphylococcus aureus* nasal carriage rate, and antimicrobial susceptibility patterns among hospitalized patients, non-hospitalized patients who visited different health facility within Urua Akpan community and their resistant patterns to commonly prescribed antibiotics.

2. MATERIAL AND METHODS

Two sets of nasal swab samples were collected from two sets of persons within Urua Akpan Community in Essien Udim Local Government Area of Akwa Ibom State. Ten (10) samples from admitted patients from different hospital wards (men, women and children) of St. Mary's Hospital Urua Akpan and ten (10) samples from healthy persons who have been on antibiotics medication within last 7 days, pro-to-sample collection, within Urua Akpan Community. All samples were obtained were obtained using sterile cotton swab pre-wetted with sterile physiological saline to rotate twice in the vestibule of both anterior nares of both persons and aseptically placed back in each of the cabinet, labeled appropriately and transported immediately to Microbiology Laboratory of the Department of Biological Sciences, Akwa Ibom State Polytechnic, Ikot Osurua for further analysis. The specimens were cultured using Manitol salt agar and incubated at 37°C for 48 hours. Viable colonies were counted and expressed as colony per swab. *Staphylococcus aureus* isolates were identified based on colony morphology, microscopic examination and biochemical activities. Antibiotic susceptibility patterns were determined with the guidelines of the CLSI, using the Kirby-Bauer disk diffusion method (CLSI, 2005). Antibiotic resistance susceptibility were tested with oxacillin antibiotics (90%, 70% and 50%) using Muller-Hinton agar plates inoculated with a suspension (equivalent to 0.5 McFarland standards) of the *S. aureus* clinical isolates. The plates were

incubated at 35°C for 24 hours and inhibition zones were measured (Skov *et al.*, 2003). The Clinical Laboratory Standards Institute (CLSI) 2005 criteria were used for interpretation.

3. RESULTS AND DISCUSSION OF RESULTS

The comparative analysis of nasal carriage antibiotic resistance of *Staphylococcus aureus* isolated from hospitalized and non-hospitalized patients within Urua Akpan community was carried out and the results of colony counts per swab as presented in table 4.1, revealed staphylococcal count from hospitalized patients ranging from 17 to 105 colonies per swab and 4 to 16 colonies per swab for non- hospitalized patients. Table 2 shows the morphologies and biochemical characteristics of *Staphylococcus aureus* obtained from hospitalized and non-hospitalized patients within Urua Akpan community.

Table 3 shows the results of *S. aureus* per swab of nasal carriage of hospitalized patients and non-hospitalized patients within Urua Akpan Community. The study revealed high frequency and percentage of occurrence of *S. aureus* from hospitalized patients, with sample 6 (HP₆) recorded the highest prevalence of 9(17.7%), followed by HP₉ which had 8(17.7%), HP₃ indicated 7(13.7%), HP₅ had 6(11.8%), HP₄ recorded 5(9.8%), HP₁ and HP₇ indicated 4(7.8%) each, HP₂ and HP₈ recorded 3(5.9%) each, while HP₁₀ indicated 2(3.9%) as the least. Non-hospitalized patients revealed low prevalence of *S. aureus* with sample 7 (NHP₇) recorded the highest frequency and percentage occurrence of 6(25.0%), followed by NHP₁₀ which had 5(20.8%), NHP₄ indicated 4(16.7%), NHP₂ had 3(12.5%), NHP₉ recorded 2(3.8%), NHP₃ and NHP₆ recorded 1(4.2%) each, while sample NHP₁ and NHP₈ recorded no frequency and percentage occurrence.

Table 4 shows the antibiotic susceptibility pattern of *Staphylococcus aureus* against ofloxacin antibiotics with zone of inhibition. *Staphylococcus aureus* obtained from nasal swab sample of hospitalized patients one (PH₁) was sensitive to ofloxacin with zone of inhibition 24mm at concentration of 90%, 19mm at concentration 70% and 18mm at concentration of 50%. *Staphylococcus aureus* obtained from nasal swab sample of hospitalized patients four (HP₄) were sensitive to ofloxacin with zone of inhibition of 25mm at concentration of 90%, 20mm at 70% concentration, and 18mm at 50% concentration. *Staphylococcus aureus* obtained from nasal swab sample of hospitalized patients two (HP₂) recorded zone of inhibition of 20mm and 18mm at concentration of 90%. Hospitalized patients eight (HP₈) recorded zone of inhibition of 23mm and 18mm at 90%, hospitalized patients three (HP₃), patients six (HP₆) and patients seven (HP₇) were sensitive to ofloxacin only at concentration of 90% with zone of inhibition of 18mm, 19mm and 20mm respectively.

Non-hospitalized patients swap samples in Urua Akpan community revealed that all isolated *Staphylococcus aureus* were sensitive to ofloxacin at all concentration, with highest zone of inhibition recorded in patient swab sample four (NHP₄) which ranged from 19-35mm, NHP₃ ranged from

18 - 31mm, NHP₆ ranged from 19 - 32mm, NHP₇ ranged from 18 - 31mm, NHP₁₀ ranged from 18- 30mm, NHP₉ ranged from 18- 26 mm, NHP₅ and NHP₂ had zone of inhibition ranging from 17- 26mm and 18- 29 mm respectively.

Table 1 shows the colony count per swab of nasal carriage of hospitalized patients and non-hospitalized patients within Urua Akpan Community

Nasal carriage of hospitalized patients	Colony count per swab	Nasal carriage of non-hospitalized patients	Colony count per swab
HP ₁	17	NPH ₁	-
HP ₂	22	NPH ₂	11
HP ₃	65	NPH ₃	6
HP ₄	25	NPH ₄	13
HP ₅	85	NPH ₅	4
HP ₆	105	NPH ₆	8
HP ₇	76	NPH ₇	17
HP ₈	64	NPH ₈	-
HP ₉	47	NPH ₉	7
HP ₁₀	75	NPH ₁₀	16

Keys

- No growth recorded
- HP - Hospital Patients from different wards in St. Mary’s Hospital Urua Akpan
- NPH - Non-hospitalized patients within Urua Akpan Community.

Table 2: Morphological and Biochemical Characteristics of isolate from Hospitalized and Non-hospitalized Patients swap samples in Urua Akpan community, Essien Udim L.G. A. Akwa Ibom State

Sample code	Morphology characteristics	Grams stain	Coagulase	Catalase	Oxidase	Motility	Spores	Sugar fermentation				Probable organism
								Glucose	Lactose	Maltose	Sucrose	

HP ₁	Yellow, raised transparent, circular smooth	+	+	+	-	-	-	AG	AG	AG	AG	<i>Staphylococcus aureus</i>
HP ₂ /NPH ₂	Yellow, raised, transparent, circular, smooth	+	+	+	-	-	-	AG	AG	AG	AG	<i>Staphylococcus aureus</i>
HP ₃ /NPH ₃	Yellow, raised, transparent , circular, smooth.	+	+	+	-	-	-	AG	AG	AG	AG	<i>Staphylococcus aureus</i>
HP ₄ /NPH ₄	Yellow, flat, Transparent, circular, smooth	+	+	+	-	-		AG	AG	AG	AG	<i>Staphylococcus aureus</i>
HP ₅ /NPH ₅	Yellow, circular transparent. Raised, smooth	+	+	+	-	-	-	AG	AG	AG	AG	<i>Staphylococcus aureus</i>
HP ₆ /NPH ₆	Yellow, irregular, transparent, raised,	+	+	+	-	-	-	AG	AG	AG	AG	<i>Staphylococcus aureus</i>
HP ₇ /NPH ₇	Yellow, circular transparent, raised, smooth	+	+	+	-	-	-	AG	AG	AG	AG	<i>Staphylococcus aureus</i>
HP ₈	Yellow, circular transparent, raised, smooth	+	+	+	-	-	-	AG	AG	AG	AG	<i>Staphylococcus aureus</i>
HP ₉ /NPH ₉	Yellow, circular transparent, raised, smooth	+	+	+	-	-	-	AG	AG	AG	AG	<i>Staphylococcus aureus</i>
HP ₉ /NPH ₉	Yellow, circular transparent, raised, smooth	+	+	+	-	-	-	AG	AG	AG	AG	<i>Staphylococcus aureus</i>

Keys:

- HP

-

Hospitalized Patients swap samples in Urua Akpan community, Essien Udim L.G. A. Akwa Ibom State
- NHP

-

Non-hospitalized Patients swap samples in Urua Akpan community, Essien Udim L.G.A. Akwa Ibom State
- AG

-

Acid and Gas production
- +

-

Positive
- -

Negative

Table 3 Shows frequency and percentage of occurrence of *S. aureus* per swab of nasal carriage of hospitalized patients and non-hospitalized patients within Urua Akpan Community

Isolates from hospitalized patients			Isolates from hospitalized patients		
Sample Code	Frequency of occurrence	Percentage of occurrence (%)	Sample Code	Frequency of occurrence	Percentage of occurrence (%)

(n=51)			(n=24)		
HP ₁	4	7.8	NPH ₁	-	0
HP ₂	3	5.9	NPH ₂	3	12.5
HP ₃	7	13.7	NPH ₃	1	4.2
HP ₄	5	9.8	NPH ₄	4	16.7
HP ₅	6	11.8	NPH ₅	2	8.3
HP ₆	9	17.7	NPH ₆	1	4.2
HP ₇	4	7.8	NPH ₇	6	25.0
HP ₈	3	5.9	NPH ₈	-	0
HP ₉	8	15.7	NPH ₉	2	8.3
HP ₁₀	2	3.9	NPH ₁₀	5	20.8

Keys

- HP
 -
 Hospital Patients from different wards in St. Mary’s Hospital Urua Akpan
- NPH
 -
 Non-hospitalized patients within Urua Akpan Community.

Table 4: Antibiotic susceptibility pattern of *Staphylococcus aureus* against ofloxacin antibiotics with zone of inhibition

Code for Isolated <i>Staphylococcus aureus</i>	Zone of Inhibition of <i>Staphylococcus aureus</i> against ofloxacin antibiotic (mm)		
	90%	70%	50%
HP ₁	24	19	18
HP ₂	21	18	8
HP ₃	18	14	-
HP ₄	25	20	18
HP ₅	15	12	-
HP ₆	19	11	7
HP ₇	20	14	-
HP ₈	23	18	8
HP ₉	14	10	-
HP ₁₀	16	12	-
NHP ₂	27	21	18

NHP ₃	31	21	19
NHP ₄	35	23	19
NHP ₅	26	21	17
NHP ₆	32	22	19
NHP ₇	31	21	17
NHP ₉	26	20	18
NHP ₁₀	30	20	18

Keys

- HP

-

Hospitalized Patients swap samples obtained St. Mary’s Hospital Urua Akpan, Essien Udim L.G.A.
- NHP

-

Non-hospitalized Patients swap samples in Urua Akpan community, Essien Udim

Discussion

The comparative analysis of nasal carriage of *Staphylococcus aureus* emphasizes the public health significance of understanding the prevalence and antibiotic resistance associated with this pathogen among different patient populations. The results from the study indicate that the staphylococcal count among hospitalized patients ranged from 17 to 105 colonies per swab, significantly higher compared to non-hospitalized patients, which only reflected counts from 4 to 16 colonies per swab. Lower staphylococcal counts observed in non-hospitalized patients could be attributed to fewer exposure opportunities to potentially contaminated environments present in healthcare settings. Non-hospitalized individuals typically encounter fewer invasive procedures and have increased exposure to a healthy living environment, which may contribute to lower nasopharyngeal colonization rates of *Staphylococcus aureus* and non-hospitalized subjects are usually healthier, with fewer co-morbidities that may promote colonization persistence which supported the work of Miller and High, (2012).

Hospitalized patients often undergo various medical interventions, such as surgeries or prolonged admissions that provide opportunities for colonization and infection by antibiotic-resistant strains. Hospitalized patients are generally more vulnerable due to existing health conditions and the potential disruption of their natural microbial flora caused by frequent antibiotic usage which correlates with the work of Hassan *et al.* (2019). Additionally, exposure to invasive devices, such as catheters and ventilators, increases the risk of acquiring *Staphylococcus aureus*, including multidrug-resistant strains, from the healthcare environment (Michaels *et al.*, 2017). The hospital setting also harbors a diverse pool of

antibiotic-resistant bacteria due to selective pressure on pathogens caused by antibiotic use, making it conducive for the survival of resistant strains (Raza *et al.*, 2018).

The variation in the frequency and percentage occurrence of *S. aureus* nasal carriage among hospitalized and non-hospitalized patients in the Urua Akpan Community revealed that hospitalized patients carry a higher prevalence of *S. aureus* due to their compromised immune systems and underlying health conditions. Hospital environments often present higher risks for bacterial colonization and infection due to the close proximity of patients, the presence of medical devices, and increased exposure to antibiotic-resistant strains (Miller and High, 2012). Antibiotic use among hospitalized patients may also influence the flora of nasal carriage proportionally. While some antibiotics target *S. aureus* directly, others can disrupt the microbiome, potentially allowing for colonization by antibiotic-resistant strains. This dynamic is reflected in the differing isolation rates, as seen in the high occurrence among hospitalized patients. Non-hospitalized individuals might have better immune responses and less exposure to antibiotics overall, which could explain the lower occurrence rates (Gholizadeh and Ebrahimi, 2017).

The findings of this study closely align with other research efforts that have documented a higher nasal carriage prevalence in hospitalized patients compared to non-hospitalized individuals. A study conducted by Kasa *et al.* (2018) in a Nigerian tertiary hospital reported that hospitalized patients exhibited a higher nasal carriage of *Staphylococcus aureus*, with a mean count significantly greater than that observed in community-dwelling individuals. Similarly, Okafo *et al.* (2021) demonstrated that among surgical patients, the prevalence of nasal *S. aureus* was notably higher due to prolonged hospital stays and frequent antibiotic therapies. Furthermore, a comparative analysis by Thapliyal *et al.* (2020) found that non-hospitalized individuals had lower rates of nasal carriage, supporting the notion that the community environment promotes a healthier microbiome compared to healthcare settings. Hence, the increased incidence of *Staphylococcus aureus* nasal carriage linked to hospitalized patients highlights a pressing public health concern, particularly regarding antibiotic resistance. This finding is consistent with other literature demonstrating the risks associated with healthcare exposure. Continuous monitoring and infection control strategies remain essential in minimizing both nasal carriage and subsequent infections caused by antibiotic-resistant *Staphylococcus aureus* within hospital settings.

The rise of antibiotic-resistant *Staphylococcus aureus* is a major public health challenge, particularly in understanding its prevalence in different populations, such as hospitalized versus non-hospitalized patients. This analysis provides insights into the antibiotic susceptibility patterns of *Staphylococcus aureus* against ofloxacin, highlighting a significant discrepancy between these two groups regarding their response to antibiotics. The results of the antibiotic susceptibility pattern revealed varied

zones of inhibition among *Staphylococcus aureus* isolates from hospitalized and non-hospitalized patients in the Urua Akpan community. Hospitalized patients showed zones of inhibition against ofloxacin ranging from 18 mm to 27 mm at different concentrations, while non-hospitalized patients demonstrated a more significant range, with values reaching up to 47 mm at a 90% concentration (NHP₄). This indicates a notable difference in antibiotic susceptibility patterns.

The higher susceptibility observed in non-hospitalized patients can be attributed to less antibiotic exposure. Non-hospitalized individuals generally have had less prior exposure to antibiotics, which preserves their microbiota's effectiveness against pathogens. Continuous antibiotic use in healthcare settings often leads to selection pressure for resistant strains which correlate with the work of Levy *et al.* (2015). Non-hospitalized patients often present with fewer co-morbidities compared to hospitalized patients, leading to a more robust immune response that can effectively combat pathogens as reported by Boyce and Leggett, (2017). Environmental factors could also contribute to high level of sensitivity, since the non-hospitalized group is less likely to encounter the same levels of pathogen load and resistant strains that clinic and hospital environments might harbor, resulting in fewer resistant bacteria (Gandra *et al.*, 2016).

Hospitalized patients are frequently exposed to broad-spectrum antibiotics. This repeated exposure promotes survival of resistant strains, while community individuals experience less antibiotic pressure, allowing isolates to remain largely susceptible. Hospital environments are reservoirs for multidrug-resistant strains, including MRSA. According to World Health Organization (WHO, 2020), healthcare facilities are major hubs for antimicrobial resistance transmission and community individuals generally have fewer invasive procedures and underlying illnesses that predispose them to colonization by resistant strains, hence the significantly larger inhibition zones observed in isolates from non-hospitalized patients, compare to isolates from hospitalized patients. *Staphylococcus aureus* employs various mechanisms to exhibit antibiotic resistance. Beta-lactamase is an enzymes produced by *Staphylococcus aureus* which breaks down beta-lactam antibiotics and can contribute to resistance (Thompson *et al.*, 2018). Resistance can occur through mutations that alter the antibiotic targets, such as penicillin-binding proteins (PBPs), hence leads to modification of antibiotics targeted sites (Peacock and Paterson, 2015).

Efflux pumps are antibiotic mechanisms where bacteria actively transport antibiotics out of the cell, reducing the effectiveness of antibiotics on cell targeted sites. Transferable resistance genes enhance survival in antibiotic-rich environments. These mechanisms are more prevalent in hospital isolates due to intense antibiotic exposure (Li *et al.*, 2015). The findings in this study resonate with other literature regarding antibiotic resistance patterns in *Staphylococcus aureus*. Okafo *et al.* (2021) reported higher

antibiotic sensitivity in community settings compared to hospital settings, aligning with our data on increased susceptibility among non-hospitalized patients. Similarly, Kasa *et al.* (2018) found that hospital-associated strains exhibited lower susceptibility compared to their community counterparts, attributing this to increased selective pressure associated with hospitalization, which also agreed with the results of this study.

A study by Egyir *et al.* (2014) found that community-based isolates of *S. aureus* in Germany showed high susceptibility to fluoroquinolones, whereas hospital strains exhibited higher resistance rates which are in line with the antibiotics susceptibility pattern of this study. Similarly, Alghaithy *et al.* (2000) also reported significantly greater fluoroquinolone resistance among hospital personnel compared to non-hospital workers. The decreasing inhibition zones in hospitalized isolates at 70% and 50% concentrations suggested emerging high-level resistance, reduced drug permeability, partial target mutation and heterogeneous bacterial populations associated with hospitalized patients, while community (non-hospitalized patients) isolates maintained high zones across concentrations, indicating absence of resistance determinants. This analysis underscores the importance of distinguishing antimicrobial susceptibility patterns in *Staphylococcus aureus* between hospitalized and non-hospitalized patients. The findings advocate for targeted infection control measures in hospital settings and suggest that maintaining a balance of antibiotic usage in non-hospitalized populations may help reduce the prevalence of resistant strains. Continuous surveillance and antimicrobial stewardship programs are essential in mitigating the spread of antibiotic resistance.

4. CONCLUSION

The comparative analysis of nasal carriage antibiotic resistance of *Staphylococcus aureus* isolated from hospitalized and non-hospitalized patients within the Urua Akpan community revealed significant differences in bacterial counts and susceptibility to ofloxacin. The staphylococcal counts from hospitalized patients indicated a higher frequency of *S. aureus* carriage in this group compared to non-hospitalized patients. This suggests that hospitalized patients may possess a greater risk of antibiotic-resistant strains due to various factors such as frequent exposure to healthcare settings and antibiotic use. The hospitalized patients exhibited varying sensitivities to ofloxacin, with some strains demonstrating decreased susceptibility, all strains from non-hospitalized patients were susceptible across all tested concentrations. This variability underscores an important public health concern, as it indicates that non-hospitalized individuals may harbor more susceptible strains of *S. aureus*, potentially reducing the risk of resistant infections. Based on the results of this finding, it could be recommended that regular monitoring of *Staphylococcus aureus* in both hospitalized and non-hospitalized patients within the Urua Akpan

community should be carried out to track trends in antimicrobial resistance over time, prudent use of antibiotics in healthcare settings should be regulated in order to prevent the development of resistance, increase awareness concerning the risks of antibiotic resistance among both healthcare providers and the community should be carriage out effectively and effective programme strengthening infection prevention and control protocols in healthcare facilities should be facilitate to reduce the transmission of antibiotic-resistant strains.

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