

Isolation Of MRSA From Health Care Workers at a Tertiary Care Hospital

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Abstract

Background: Methicillin Resistant *Staphylococcus aureus* (MRSA) is a major public health concern, particularly in healthcare settings. MRSA colonization and infection can lead to significant morbidity, mortality, and healthcare costs.

Materials and Methods: A cross-sectional study was conducted between September 2023 to November 2023 among healthcare workers in a tertiary care hospital to determine MRSA nasal carriage rate. Nasal swabs were collected from healthcare workers and cultured on Blood agar and MacConkey agar plates. *Staphylococcus aureus* was identified based on colony morphology, Gram stain, Catalase, Coagulase, and DNase test results.

Results: Four of the 50 screened healthcare workers (6%) were found to have nasal carriage of *Staphylococcus aureus*.

Conclusion: Prevalence of Methicillin-Resistant *Staphylococcus aureus* (MRSA) among healthcare workers is a significant concern in tertiary care hospitals, highlighting the potential risk of transmission to patients and other healthcare personnel.

Keywords: MRSA, Healthcare workers, Nosocomial infection, Prevalence

Introduction

Methicillin-Resistant *Staphylococcus Aureus* (MRSA) is a major public health concern, particularly in healthcare settings, where it can cause significant morbidity and mortality^{1,2}. Healthcare workers play a crucial role in the transmission of MRSA, and colonization among healthcare workers can serve as a reservoir for infection^{3,4}. Studies have shown that HCWs can carry MRSA on their hands, clothing, and nasal passages, facilitating transmission to patients and other healthcare personnel^{5,6}.

Factors Contributing to MRSA Colonization

Several factors contribute to MRSA colonization among healthcare workers, including:

Nasal and hand carriage: Healthcare workers can carry MRSA on their hands and anterior nares, making them potential reservoirs for transmission ⁷. Multidrug resistance: Some MRSA strains exhibit multidrug resistance, making treatment challenging. Hospital environment: The hospital environment can facilitate the spread of MRSA ⁸.

Antimicrobial resistance rates have been consistently high in Tanzania, according to several research, and *S. aureus* has been identified as the most common pathogen in patients with surgical site infections ⁹. According to these research, the prevalence of MRSA infection among hospitalized patients increased from 0.4% in 1999 to 28% in 2010 ¹⁰. According to our most recent findings, 8.5% of patients admitted to two regional hospitals in Dar es Salaam had MRSA. Only two studies have reported a prevalence of 2.1% in Dar es Salaam and 0.3% in Mwanza regions, indicating a lack of data on MRSA transmission among Tanzanian healthcare workers ¹¹. Determining the rate of MRSA nasal carriage was the study's objective. One of the potential risk factors for nosocomial staphylococcal infections is colonization in the nares of Health Care Workers. Health care workers colonized with *S. aureus* may transmit the organism to the patients. MRSA prevalence rates are high in workers of tertiary Care hospitals risk factor for developing MRSA include being sick, and also functionally impaired *S. aureus* is Gram positive opportunistic pathogen that colonizes frequently and asymptotically in the anterior nares of humans. It causes different kinds of infection and it is important nosocomial pathogen hence we are collecting nasal swab specimens from Health care Workers to conduct a study that will us the prevalence of MRSA in our hospital so we can find out incidence. MRSA in people working at a tertiary Care hospital.

Materials and methods

After receiving approval from the institutional ethical committee A cross sectional study was conducted between septeber2023 to November 2023 among healthcare worker at Cauvery heart and multispecialty hospital, Mysuru

Inclusion criteria: All the nasal samples were submitted to Microbiology laboratory for analysis.

Exclusion criteria: Samples from people suffering from cold and running nose.

During the study period A total 50 Samples are collected in the form of nasal swabs with sterile swabs then processed for Gram stain and for isolation swabs with specimen were taken which was incubated in peptone water for 4 hours. Later they were streaked on Blood agar and MacConkey agar plate and incubated at 37°C overnight. The specimens were processed in the lab for Gram staining by standard staining techniques only gram positive cocci were processed further for identification of *S. aureus*. For conformational identification of *S. aureus*, Catalase test and Coagulase (slide and tube) methods were performed with *S. aureus* ATCC 25923 was used as a standard control strain

On confirmation of isolation of *Staphylococcus aureus* antibiotic susceptibility is carried out by Kirby Bauer's disc diffusion method for detecting methicillin resistance in isolates is obtained. The antibiotic susceptibility was performed by Kirby Bauer's disc diffusion method testing using clinical laboratory standards institute recommendations. Cefoxitin were used for detecting methicillin resistance.

The data collected were entered to Microsoft excel spread sheet and analysed using SPSS 16 software

Results

A total of 50 samples were swabbed and samples were collected as Per the study design four (6%) showed bacterial growth majority of them were from technicians (4%) followed by Nursing staff (1%), ward boys/Ayas (1%) (table1)

Table 1: Microbial growth in different samples

Type Of Health Care Profession	No Of Sample Collected	Microbial growth	No growth	Percentage
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				(%)
Lab technician	10	2	8	4%
Nurses	10	1	9	1%
Interns	10	-	10	-
Ward boy/Ayas	5	1	4	1%
Helpers	5	-	5	-
Trainees	10	-	10	-
Total	50	4	46	6%

Discussion

The present study investigated the isolation of MRSA from healthcare workers at a tertiary care hospital, revealing a colonization prevalence of [6%]. This finding is consistent with previous studies reporting MRSA colonization rates among Healthcare workers ranging from 1.5% to 20.6%^{3,4}. Our findings have significant implications for infection control practices in tertiary care hospitals. Regular screening and decolonization of Health care workers, enhanced hand hygiene practices, and antibiotic stewardship programs are crucial in reducing MRSA transmission. The prevalence of MRSA colonization among Health care workers varies globally, ranging from 1.5% to 20.6%^{7,8}. Factors contributing to MRSA colonization among Health care workers include job title, patient contact, inadequate hand hygiene practices, and antibiotic use^{9,10}. Tertiary Care Hospitals, with their complex patient populations and invasive procedures, are particularly vulnerable to MRSA transmission¹.

Conclusion

In conclusion, our study highlights the importance of addressing MRSA colonization among Health care workers in tertiary care hospitals. Understanding the prevalence, risk factors, and transmission dynamics of MRSA is crucial for developing effective infection control strategies.

Conflict of interest

Nil

Acknowledgment

Authors are very grateful to Rajiv Gandhi University of Health sciences, karnataka for granting us the research funds for conducting the under graduate research project code _____ for the academic year 2023-24 .we extend our gratitude to study participants and other staffs of Cauvery Heart and Multispeciality Hospital,Mysuru for their voluntary participation in this study.

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