Determination of MICs of Methicillin-resistant and Methicillin-susceptible \textit{Staphylococcus aureus} Isolated from a Tertiary-care Hospital in Guyana

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**Authors' contributions**

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

**Article Information**

DOI: 10.9734/JAMMR/2019/v30i1230256

Reviewers and Editors: This manuscript was reviewed and approved by Conference Organising committee.

**Conference Abstract**

\textbf{ABSTRACT}

\textbf{Objective:} Previous studies done in the hospital setting in Guyana have shown that the frequency of isolation of methicillin-resistant \textit{Staphylococcus aureus} isolates far exceeds the worldwide estimate of 50%. These past studies have been based on the use of the Kirby-Bauer disk diffusion methodology. The present study was conducted to determine the minimum inhibitory concentration of clinical isolates of methicillin-susceptible and methicillin-resistant \textit{S. aureus} using the broth microdilution method.

\textbf{Design and Methods:} A total of 101 consecutive, non-repetitive \textit{S. aureus} isolates obtained from the GPHC medical lab during a six-week period were included in the study. These isolates were identified as MRSA and MSSA by laboratory personnel using the cefoxitin disk diffusion method. The oxacillin MICs for all isolates obtained were determined using prepared oxacillin broth microdilution trays with concentrations ranging from 4 \(\mu\)g/ml to 256 \(\mu\)g/ml. All results were interpreted according to CLSI guidelines.

\textbf{Results:} The prevalence of MRSA at GPHC was found to be 65.35\% with a majority of the isolates being high level oxacillin resistant strains with MICs > 256 \(\mu\)g/ml (84.85\%). In our study, most resistant isolates were collected from patients admitted to the FSW (16.67\%), Paediatric Wards (13.65\%), MSW (13.64\%), and FMW (12.12\%). Additionally, 35 (79.55\%) MSSA were suspected oxacillin susceptible with MIC < 4 \(\mu\)g/ml. The relationship between the cefoxitin disc diffusion and oxacillin broth microdilution results was found to be statistically significant with \(p < 0.001\).

\textbf{Conclusion:} Methicillin-resistance continues to be a major problem in the hospital setting, and this
study has shown that commonly used conventional techniques are unlikely to identify all of the potentially resistant isolates.

**Recommendation**: The high prevalence and high oxacillin MIC of MRSA at GPHC suggests that more emphasis should be placed on infection control and surveillance programs within the hospital setting.

**Keywords**: MICs; methicillin-resistant; methicillin-susceptible; Staphylococcus aureus.

**COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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