Methicillin Resistant Staphylococcus aureus nasal carriage and associated factors in a rural tertiary hospital in Eastern Uganda: A prospective cross-sectional study

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Abstract

Background: Asymptomatic carriage of Methicillin-Resistant Staphylococcus aureus (MRSA) can predispose the host to a wide array of infections that can be difficult to treat due to antibiotic resistance. To inform public health strategies, the study sought to describe MRSA nasal carriage frequencies and the associated factors concerning nasal carriage among patients attending Mbale Regional Referral Hospital (MRRH). Methods: Nasal swabs were obtained from consented (aged >15years) participants presenting to the hospital for medical care between January and April 2018 [L1] . Direct Culture of swabs was performed on blood agar and then incubated at 37℃ for 24 hours. Identification of S. aureus was done using conventional biochemical tests. Phenotypic screening and confirmation of MRSA was done using cefoxitin disc (30µg) test and MICs on the Phoenix M50 instrument respectively. Patient demographic characteristics and the MRSA nasal carriage risk factors were collected using a pre-tested questionnaire. Results: Overall, majority of the participants were in-patients (138, 63.3%) with the proportions of both females and males among the participants being 154/218 (70.6%) and 64/218 (29.3%) respectively. Mean age for both female and male participants was 40.16 (SD± 17.04) years respectively. S . aureus nasal carriage rate among the participants was 22.9% (50/218), with 57.9% (29/50) of the harboured strains phenotypically expressing methicillin resistance (mecA mediated). Phenotypic co-expression with i nducible clindamycin resistance and vancomycin resistance was displayed in 45.5% (23/50) and 2% (1/50) of the studied isolates respectively. Colonisation with MRSA did not show any significant relationship with all the studied factors. Conclusion : There was a moderate S. aureus nasal carriage among the participants in Mbale Regional Referral Hospital with a highly noted phenotypic expression of methicillin resistance among the isolated S. aureus strains. The studied factors were not significantly associated with the rate of MRSA nasal carriage. For surveillance purposes to combat future outbreaks, there is a need to do a larger study to better draw generalizable conclusions of carriage in the population.

[L1] This is an important statement. I suggest that we reinstatate it if we are still in recommended word count

Background

*S. aureus*is among the most significant human bacterial pathogens worldwide (1), with MRSA currently being the most common antibiotic-resistant strain in most of the hospital and community settings (2)(3). *S. aureus* is also the second leading cause of nosocomial bacteremia (4) and has been highlighted as a priority organism of interest by the WHO (5). Asymptomatic nasal carriage of MRSA can predispose the host to a wide array of infections that would pose a challenge in the management of the cases in the current era of antibiotic resistance (6)(7).

The magnitude of MRSA remains greatly unknown in developing countries yet surveillance systems to guide interventions require expertise and resources, which are inadequate(8). Studies conducted elsewhere by Conceiçao *et al*., and Aiken *et al*., documented MRSA prevalence rates of 26.9% and 7.0% respectively (9)(10). However, in resource-limited settings, not much has been done to explore on MRSA nasal carriage as reported by Bebell *et al.,* 2016 and yet MRSA is currently recognized as the leading