

A study of nasal colonization of MRSA in health care workers of bharati hospital Sangali Maharashtra

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Abstract

Introduction: Staph. aureus is a versatile pathogen capable of causing a wide variety of infections. With the development of resistance to all β -lactam antibiotics, treatment of these infections has become problematic. In recent years MRSA remains one of the most prevalent multidrug resistant organism causing healthcare associated infections. **Aims and Objectives:** To Study prevalence Nasal Colonization of MRSA in Health Care Workers of Bharati Hospital Sangali Maharashtra. **Methodology:** This was a Cross-sectional Study carried out in Health Care Workers of Bharati Hospital Sangali Maharashtra during the Period of January 2015 to January 2016. Over all 82-Doctor;31-Intern;57-Nurse;20-Attender;14-Laboratory personnel ;5-Others health workers were included into the study. Those workers who given consent wish to participate into study were included while those who did not given consent were excluded from the study. A Nasal Swab was collected from Participants with all aseptic precaution. From the collected samples Microscopy and Culture and Antibiotic Sensitivity testing were carried out using Kirby-Bauer's disc diffusion method as per CLSI guidelines. **Result:** Majority of the Health workers Shown prevalence of S. aureus and MRSA was in Doctor i.e. 8.13% and 1.43% followed by Nurse-4.30% and 2.39%; Laboratory personnel-2.87% and 0.47%; Intern-1.9% and 0.95%; Attender-1.43% and 0.95%; Others -0.95% and 0.47%; Overall was 19.61% and 6.7% Respectively. Maximum resistant was found to Penicillin i.e. 70% followed by Erythromycin-40%; Cloxacillin-29.8%; Cefoxitin-21.9%; Cotrimoxazole-18.1%; Gentamycin-16%; Ceftriaxone-10%; Teicoplanin-9.4%; Tetracycline-7.2%; Ciprofloxacin-3.1%; Clindamycin-3%; Amikacin-1% Intermediate Resistant to Amikacin and No resistant to Vancomycin was seen. **Conclusion:** Majority of the Health workers Shown prevalence of S. aureus and MRSA was in Doctor followed by Nurse, Laboratory personnel, Intern, Attender, Others but prevalence of MRSA found more in Nurses and Overall Maximum resistance to drugs were Penicillin, Erythromycin while there was no resistance found to Vancomycin and only intermediate resistance to Amikacin.


Keywords: MRSA, Health Care Workers, CLSI guidelines.

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Received Date: 05/03/2016 Revised Date: 19/04/2016 Accepted Date: 12/05/2016

Access this article online	
Quick Response Code:	Website: www.medpulse.in
	DOI: 15 May 2016

INTRODUCTION

Staph. aureus is a versatile pathogen capable of causing a wide variety of infections.¹ With the development of

resistance to all β -lactam antibiotics, treatment of these infections has become problematic. In recent years MRSA remains one of the most prevalent multidrug resistant organism causing healthcare associated infections. In healthcare settings, patients who are colonized by or infected with MRSA act as a reservoir and a source for the spread of this organism occurring mainly through transiently colonized healthcare workers (HCWs).^{2,3} Asymptomatically colonized patients and healthcare workers are the major sources of MRSA in hospital environment, with the latter being more commonly identified as links in the transmission of MRSA between patients.⁴ The severity of infections by MRSA adds to the economic burden of the patient due to longer hospital stay and prolonged antibiotic

administration. It is therefore imperative for health services to carry out systematic MRSA surveillance and disseminate the findings to health professionals.⁵ Most colonized health professionals are transient carriers but may become persistent carriers, especially when they have skin lesions. Thus the identification and treatment of colonized health professionals can reduce the incidence of MRSA.⁵ Healthcare workers (HCWs) who are at interface between the hospital and the community may serve as agents of cross contamination of Hospital acquired MRSA (HA-MRSA) and CA-MRSA⁶. HCWs are the source of nosocomial transmission of MRSA in developing countries^{7, 8}. The average nasal carriage rate of *S. aureus* and MRSA among HCWs has been shown to be 23.7 and 4.6 % respectively⁶. Different studies have showed nasal carriage rate of *S. aureus* among HCWs to be 20.37 – 43.8 %⁹⁻¹².

AIMS AND OBJECTIVES

To Study prevalence Nasal Colonization of MRSA in Health Care Workers of Bharati Hospital Sangali Maharashtra.

MATERIAL AND METHODS

This was a Cross-sectional Study carried out in Health Care Workers of Bharati Hospital Sangali Maharashtra during the Period of January 2015 to January 2016. Over all 82-Doctor; 31-Intern; 57-Nurse; 20-Attender; 14-Laboratory personnel; 5-Others health workers were included into the study. Those workers who given consent wish to participate into study were included while those who did not given consent were excluded from the study. A Nasal Swab was collected from Participants with all aseptic precaution. From the collected samples Microscopy and Culture and Antibiotic Sensitivity testing were carried out using Kirby-Bauer's disc diffusion method as per CLSI guidelines.¹³

RESULT

Table 1: Shows Nasal Colonization of the MRSA among healthcare workers

Healthcare workers	No of samples	S. aureus	(%)	MRSA	(%)
Doctor	82	17	8.13%	3	1.43%
Intern	31	4	1.9%	2	0.95%
Nurse	57	9	4.30%	5	2.39%
Attender	20	3	1.43%	2	0.95%
Laboratory personnel	14	6	2.87%	1	0.47%
Others	5	2	0.95%	1	0.47%
Total	209	41	19.61%	14	6.7%

Majority of the Health workers Shown prevalence of *S. aureus* and MRSA was in Doctor i.e. 8.13% and 1.43% followed by Nurse-4.30% and 2.39%; Laboratory personnel -2.87% and 0.47%; Intern-1.9% and 0.95%; Attender-1.43% and 0.95%; Others -0.95% and 0.47%; Overall was 19.61% and 6.7% Respectively.

Table 2: Distribution of isolated *S. Aureus* with respect to Antibiotic susceptibility

Antibiotics	Sensitive (%)	Intermediate (%)	Resistant (%)
Amikacin	99	1	0
Cefoxitin	78.1	0	21.9
Ceftriaxone	78	12	10
Cloxacillin	70.2	0	29.8
Cotrimoxazole	81.9	0	18.1
Ciprofloxacin	72.1	24.8	3.1
Clindamycin	95	2	3
Erythromycin	45	15	40
Gentamycin	80	4	16
Penicillin	30	0	70
Teicoplanin	84.3	6.3	9.4
Tetracycline	93.8	0	7.2
Vancomycin	100	0	0

From the Above Table maximum resistant was found to Penicillin i.e. 70% followed by Erythromycin-40%; Cloxacillin-29.8%; Cefoxitin-21.9%; Cotrimoxazole-18.1 %; Gentamycin-16%; Ceftriaxone-10%; Teicoplanin-9.4%; Tetracycline-7.2%, Ciprofloxacin-3.1%; Clindamycin-3%; Amikacin-1% Intermediate Resistant and No resistant to Vancomycin was seen.

DISCUSSION

It is necessary to detect MRSA in HCWs as they can act as carriers and thus act as a potential source of microorganisms. Carriage of *Staph. aureus* appears to play a key role in the epidemiology and pathogenesis of infection. In healthy subjects, over time, three patterns of carriage can be distinguished: about 20% of people are persistent carriers, 60% are intermittent carriers, and approximately 20% almost never carry *Staph. aureus*. Also Staphylococcal carrier status can lead to nosocomial infection.¹⁴ In our study we have found that Majority of the Health workers Shown prevalence of *S. aureus* and MRSA was in Doctor i.e. 8.13% and 1.43% followed by Nurse-4.30% and 2.39%; Laboratory personnel -2.87% and 0.47%; Intern-1.9% and 0.95%; Attender-1.43% and 0.95%; Others -0.95% and 0.47%; Overall was 19.61% and 6.7% Respectively these findings are comparable with Blok H.E. *et al*¹⁵ reported less than 5% HCWs to be colonized with MRSA. Higher MRSA carrier rate of 15% and 13.6% is reported by Bisaga A *et al*¹⁶ and Suffolet to B P *et al*¹⁷ respectively in USA. Milton Jorge de Carvalho *et al*¹⁸ Also maximum resistant

was found to Penicillin i.e. 70% followed by Erythromycin-40%; Cloxacillin-29.8%; Cefoxitin-21.9%; Cotrimoxazole-18.1%; Gentamycin-16%; Ceftriaxone-10%; Teicoplanin-9.4%; Tetracycline-7.2%, Ciprofloxacin-3.1% ;Clindamycin-3%; Amikacin-1% Intermediate Resistant and No resistant to Vancomycin was seen these findings are comparable with Rita Khanal *et al*¹⁹.

CONCLUSION

Majority of the Health workers Shown prevalence of *S. aureus* and MRSA was in Doctor followed by Nurse, Laboratory personnel, Intern, Attender, Others but prevalence of MRSA found more in Nurses and Overall Maximum resistance to drugs were Penicillin, Erythromycin while there was no resistance found to Vancomycin and only intermediate resistance to Amikacin.

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Source of Support: None Declared
Conflict of Interest: None Declared