**ISOLATION OF METHICILLIN RESISTANT STAPHYLOCOCCI AMONG HEALTH CARE WORKERS**

Hemavathi¹, Pooja Sarmah²

¹Professor and HOD, Department of Microbiology, Sathguru Institute of Medical Sciences and Research Centre, Bangalore.
²Associate Professor, Department of Microbiology, Sathguru Institute of Medical Sciences and Research Centre, Bangalore.

**ABSTRACT**

**BACKGROUND**

Hospital-acquired infections by Methicillin resistant Staphylococcus aureus (MRSA) and Methicillin resistant coagulase negative Staphylococci (MR-CONS) are important in the health care setting and the usual source of infection is the health care worker.

**MATERIALS AND METHODS**

Following increase in postoperative wound infection with MRSA, 39 swabs from health care workers were screened for MRSA and methicillin resistant CONS carriage by collecting nasal and web space swabs and processed.

**RESULTS**

The carrier rate for MRSA was 10% and methicillin resistant CONS was 36% from the anterior nares of HCW’s.

**CONCLUSION**

Any increase in MRSA or MR-CONS should be followed by prompt identification and screening of all health care workers and environmental surveillance. It has to be followed by appropriate treatment of MRSA carriers. These measures can reduce the chance of patients acquiring these bacterial infections and hence reduce the hospital-acquired infections.

**KEYWORDS**

Methicillin Resistant Staphylococcus Aureus, Nosocomial Infection.

**HOW TO CITE THIS ARTICLE:** Hemavathi, Sarmah P. Isolation of methicillin resistant staphylococci among health care workers. Journal of Evolution of Research in Medical Microbiology 2016; Vol. 2, Issue 2, July-December 2016; Page:17-18

**BACKGROUND**

Nosocomial infections or Hospital-Acquired Infections (HAI) causes increased morbidity, mortality and cost among hospitalised patients. The incidence of HAI in the Western countries is around 5% - 10% and 20% - 30% in India.[¹] Various organisms like Methicillin resistant Staphylococcus aureus (MRSA), extended spectrum beta-lactamase (ESBL) producers, Pseudomonas, Acinetobacter, Enterobacteriaceae species may cause HAI. The source of infection may be of endogenous origin, i.e. patients commensal flora or exogenous origin, i.e. from the Health Care Workers (HCW), other patients and the hospital environment. Pathogens isolated from the hospital are usually resistant to multiple antibiotics due to selective pressure in the hospital due to overuse of antibiotics.[²]

Staphylococcus is an important pathogen causing nosocomial infections.[³]

The infection rates of methicillin resistant Staphylococcus aureus (MRSA) and methicillin resistant coagulase negative Staphylococci (CONS-MR) are increasing.

In a Japanese National Surveillance, the incidence of MRSA hospital infections per 100 admissions was between 0.7 and 0.8 from 1999 to 2003.[⁴]

MRSA was first isolated in the year 1961[⁵] and it was known to cause serious infections among hospitalised patients. These infections are difficult to treat, as they need expensive and comparatively toxic antibiotics like vancomycin, linezolid, etc. Some strains have also developed partial or complete resistance to Vancomycin.[⁶,⁷] The major problem with MRSA is its ability to reside as normal flora among HCW’s in various sites like the nose, hands, axilla, perineum, etc.[⁸] The HCW’s can become important source of infection in the health care setting, especially those working in the OT, ICU, post-operative wards, etc. The carriage rate of MRSA among HCW ranges from 20% - 48%.[⁹]

**CASE STUDY**

An increase in post-operative wound infections in the Obstetrics and Gynaecology Department of our hospital prompted this study. Three patients developed postoperative wound infection with MRSA in August 2011, following which all the 39 HCW’s who came in contact with the above patients were screened for MRSA and methicillin resistant CONS carriage by collecting nasal and web space swabs.

To collect nasal swabs, a pre-moistened cotton swab was introduced into both anterior nares and rotated for 5 - 6 seconds and immediately plated on blood agar and MacConkey agar plates and for collecting web-space swabs a sterile pre-moistened swab was rubbed over the web spaces and the swabs immediately plated on blood agar and MacConkey agar plates. The plates were incubated overnight at 37 degrees. The colonies on the plates were studied by Gram staining, catalase and slide coagulase test. Tube coagulase test was also done. Antibiotic sensitivity pattern was determined by Kirby-Bauer disc diffusion technique. Staphylococci resistant to Cefoxitin 30 microgram disc (Hi-Media) were identified as MRSA/methicillin resistant CONS and the resistance pattern noted. This was according to the Clinical Laboratory Standards Institute (CLSI) guidelines. Environmental swabs were also collected from various areas in the ward and operation theatre...
to trace the source of infection and the swabs were processed by standard microbiological methods. The HCW’s with MRSA and CONS MR in the anterior nares or web space were identified as carriers and advised to apply one to two percent mupirocin ointment in the anterior nares, two to three times per day for five days. They were asked to use barrier precautions like gloves and mask while handling patients and also follow Universal or Standard precautions and avoid working in the operation theatre and also avoid dressing of patient’s wounds for one week. Once the duration of treatment was complete, the health care personnel was asked to submit another nasal and web-space swab to make sure he/she was no longer a carrier.

RESULTS

<table>
<thead>
<tr>
<th>Specimen</th>
<th>S. aureus</th>
<th>CONS Methicillin Resistant</th>
<th>CONS Methicillin Sensitive</th>
<th>No Growth</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal swab</td>
<td>6</td>
<td>16</td>
<td>23</td>
<td>58</td>
<td>39</td>
</tr>
<tr>
<td>Web space swab</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>39</td>
</tr>
</tbody>
</table>

Table 1. Distribution of Staphylococci from Various Sites

Table 2. Isolation of Methicillin Resistant and Sensitive Strains

DISCUSSION

In the study conducted in our Centre, Coagulase negative Staphylococcus was isolated in majority of the health care workers as compared to S. aureus. CONS by itself is not a major pathogen, but it may cause disease in the immunocompromised patients. The carrier rate of methicillin resistant CONS was less compared to a study by Akhtar N, which showed carriage rate of 2.1% which is low compared to our study.[10] The MRSA carrier rate among HCW’s in our study was 10%, which is more compared to the study conducted by Emma Hitt, where MRSA was isolated in 4% of the health care workers.[11] However, other studies show varied carriage rate ranging from 20% - 48%.[9]

The web spaces mostly show no growth of bacteria. The reason we attribute probably is prior washing of the hands by the health care worker despite giving them instructions not to do so before giving the sample. The MRSA carrier rate in the web space was 3%, other studies also reveal low MRSA rates like our study.[12]

Environmental swabs yielded no isolation of Staphylococci. The repeat swab collected from the HCW’s following treatment also yielded no growth, thus eliminating the carrier rate.

Isolation of Methicillin resistant Staphylococci from HCW’s is significant due to the possibility of them acting as source of infection to the patients. Hence, identification of Methicillin resistant Staphylococci carriers is important.

CONCLUSION

Screening of Health Care Workers for Methicillin resistant Staphylococci carriage should be done periodically. Once identified proper treatment should be given. By this a significant number of HAI can be prevented and patients managed better. Adherence to good infection control practices like use of proper hand hygiene technique must also be followed.

REFERENCES