Strategies to Prevent and Control Methicillin-resistant *Staphylococcus aureus* Infections in a Tertiary Hospital

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Objectives

- Background
- MRSA Surveillance Program
- MRSA Infection Prevention & Control strategies
- Outcome Measures
- Lessons learnt
Universiti Kebangsaan Malaysia Medical Centre

- 850-bed tertiary teaching hospital
- Major clinical consultancy services
- About 3000 admissions/month
IPC strategies for the identification, management and control of MRSA

- Reduce the risk of transmission of MRSA
- Minimize the risk of patients acquiring an MRSA HCAI
Infection Control Nurse (ICN) daily visited the Microbiology Laboratory

- All positive MRSA culture results upon validation were placed in a designated pigeon hole
- collect MRSA data
- MRSA line listing
ICN Ward Visit

- Visit all MRSA patients
- Adherence to contact precaution
- Isolation room / cohort patients
- Emphasize 5-moments of hand hygiene
- Cleaning and disinfection of equipment
- Environmental hygiene
- Visitor policies
Isolation or Cohort

Contact Precaution

Isolation

Cohort
Your 5 moments for **HAND HYGIENE**

1. Before Patient Contact
2. Before Aseptic Task
3. After Body Fluid Exposure Risk
4. After Patient Contact
5. After Contact With Patient Surroundings

**Hand Hygiene at the Point of Care**
Determine MRSA Infection / Colonization

Rx MRSA Infection
- Anti-MRSA agents

Decolonized MRSA Colonizer
- Intranasal mupirocin bd x 5 days
- Chlorhexidine bath daily x 5 days
Reinforced Staff Education
• Active Surveillance MRSA Screening Upon Admission and Weekly
  ➢ ICU
  ➢ NICU
Timeliness Tracking MRSA cases
Outcome measures

- MRSA HCAI rates
- Total MRSA rates (infection plus colonization)
- excluding duplicate MRSA isolates from the same patient
- reported to relevant stakeholders and Ministry of Health, Malaysia
Rate of Total MRSA & MRSA Infection
Universiti Kebangsaan Malaysia
Year 2013 -2017

Rate of MRSA/1000 patient days

2013 2014 2015 2016 2017
0.98 1.19 1.53 1.48 1.48
0.17 0.15 0.10 0.08 0.06

Figure 1: Rate of Total MRSA & MRSA Infection/1000 patient days

Statistical Analysis
- one-way repeated measures ANOVA
- compare MRSA HCAI rates from 2013 till 2017

Seminal Declining Trend of MRSA HCAI
- p value = 0.031
(Wilks’ Lambda = 0.302, F = 4.627, p=0.031, multivariate eta squared = 0.698)
Comparison Rates MOH Vs UKMMC

**UKMMC MRSA Rate 2017**

<table>
<thead>
<tr>
<th>ORGANISMS</th>
<th>No. of Infection</th>
<th>No. of Coloniser</th>
<th>No. of Total Isolates</th>
<th>Rate Per 100 Admissions Infection</th>
<th>Rate Per 1000 Pt Days Infection</th>
<th>Rate Per 100 Admissions Total Isolate</th>
<th>Rate Per 1000 Pt Days Total Isolate</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRSA</td>
<td>1,342</td>
<td>1,149</td>
<td>2,491</td>
<td>0.08</td>
<td>0.14</td>
<td>0.18</td>
<td>0.34</td>
</tr>
<tr>
<td>ESBL-KLEBS PNEUMO</td>
<td>1,076</td>
<td>1,312</td>
<td>3,288</td>
<td>0.11</td>
<td>0.19</td>
<td>0.26</td>
<td>0.45</td>
</tr>
<tr>
<td>ESBL-E.COLI</td>
<td>863</td>
<td>1,051</td>
<td>1,914</td>
<td>0.05</td>
<td>0.11</td>
<td>0.12</td>
<td>0.26</td>
</tr>
<tr>
<td>MDR A.BAUMANNII</td>
<td>1,452</td>
<td>1,206</td>
<td>2,658</td>
<td>0.08</td>
<td>0.15</td>
<td>0.20</td>
<td>0.36</td>
</tr>
<tr>
<td>CRE</td>
<td>428</td>
<td>687</td>
<td>1,115</td>
<td>0.02</td>
<td>0.06</td>
<td>0.06</td>
<td>0.15</td>
</tr>
<tr>
<td>VRE</td>
<td>72</td>
<td>71</td>
<td>143</td>
<td>0.004</td>
<td>0.01</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>TOTAL</td>
<td>6,033</td>
<td>5,576</td>
<td>11,409</td>
<td>0.08</td>
<td>0.66</td>
<td>0.83</td>
<td>1.59</td>
</tr>
</tbody>
</table>

**UKMMC MRSA HCAI rates**
- far below the national MRSA HCAI rates
Implementation of multifaceted approaches is crucial in the success of preventing and controlling further spread of MRSA as decreasing MRSA HCAI rates were observed throughout the five years’ period.

Impact of antimicrobial stewardship program on MRSA HCAI need consideration for future endeavor.