Colistin Susceptibility Testing Using the MicroScan® Colistin Well

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Table 3: Antibiotic Resistance (% Resistant)

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Lactose Fermenting (n=150)</th>
<th>Non-Lactose Fermenting (n=150)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABX</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ampicillin</td>
<td>53%</td>
<td>43%</td>
<td>0.161</td>
</tr>
<tr>
<td>Amp-Sulbactam</td>
<td>25%</td>
<td>20%</td>
<td>0.441</td>
</tr>
<tr>
<td>Pipracillin-Tazobactam</td>
<td>2%</td>
<td>3%</td>
<td>0.992</td>
</tr>
<tr>
<td>Cefazolin</td>
<td>18%</td>
<td>9%</td>
<td>0.078</td>
</tr>
<tr>
<td>Ceftriazone</td>
<td>13%</td>
<td>4%</td>
<td>0.056</td>
</tr>
<tr>
<td>Cefepime</td>
<td>8%</td>
<td>1%</td>
<td>0.033</td>
</tr>
<tr>
<td>Carbenemenes</td>
<td>0</td>
<td>0/25</td>
<td>N/A</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>11%</td>
<td>15%</td>
<td>0.222</td>
</tr>
<tr>
<td>TMP-SMX</td>
<td>31%</td>
<td>25%</td>
<td>0.135</td>
</tr>
<tr>
<td>Cipro</td>
<td>27%</td>
<td>30%</td>
<td>0.082</td>
</tr>
<tr>
<td>ESBL Positive</td>
<td>12</td>
<td>2</td>
<td>0.049</td>
</tr>
</tbody>
</table>

NLFEC isolates were more likely to be found in patients admitted from the community (97% vs 73% P = 0.03) rather than hospital acquired (3% vs 27% P = 0.009). There was no difference in rates of colonization (36% vs 46% P = 0.14) and pathogenicity (64% vs 54% P = 0.256), nor site of infection.

NLFEC demonstrated a trend to statistical significance to be less resistant to later generation Cephalosporin. They were less likely to be resistant to Cefepime (1% vs 8% P = 0.003) and be flagged as an ESBL isolate.

Conclusion. Non-Lactose Fermenting E. coli are more likely to be isolated from patients in the community, have no difference in predilection for nor site of infection, and are less likely to be resistant to later generation Cephalosporins.

Disclosures. All authors: No reported disclosures.

2017. Colistin Susceptibility Testing Using the MicroScan® Colistin Well

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Session: 234. Diagnostics – Bacterial Identification and Resistance
Saturday, October 7, 2017: 12:30 PM

Background. Antimicrobial resistance is a threat to public health. As carbapenem-resistant Enterobacteriaceae, multidrug-resistant Pseudomonas aeruginosa, and multidrug-resistant Acinetobacter baumannii have increased in prevalence, there has been increased use of colistin as a therapeutic option. However, testing for colistin susceptibility is problematic for most clinical microbiology laboratories. Also, there is a paucity of surveillance data on the prevalence of colistin resistance in the United States. MicroScan® Gram-negative panels include a colistin well (4 μg/mL) to aid in the identification of bacteria, but it is not known whether this well can be used to assess the prevalence of colistin resistance.

Methods. All Escherichia coli, Klebsiella pneumonia, K. oxytoca, Enterobacter cloacae, E. aerogenes, P. aeruginosa, or A. baumannii identified at the Emory University clinical microbiology laboratory between January 1, 2016 and December 31, 2016 were included in the study. Routine bacterial identification and antimicrobial susceptibility testing were performed using the MicroScan WalkAway 96 plus® and the Neg Breakpoint Combo Panel Type 41 or 44 (transition from 41 to 44 was made in March 2016). When these isolates were susceptible to three or fewer charted drugs, or upon provider request, a colistin ETEST® was performed.

Results. There were 288 out of 9296 isolates (3.1%) that had growth in the colistin MicroScan® well, suggesting colistin resistance. This included 79 E. coli (1.5%), 90 Klebsiella spp. (4.2%), 91 Enterobacter spp. (15.1%), 24 P. aeruginosa (1.9%), and 4 A. baumannii (3.7%). ETEST® was performed on 40 of the 288 isolates (13.9%). The MicroScan® colistin well result was confirmed (defined as an ETEST® MIC>2) in 27 out of 40 cases (67.5%).

Conclusion. Resistance to colistin, at this single academic medical center, may be higher than what was previously appreciated. This is a concerning finding. Further investigation is needed to determine whether the MicroScan® colistin well can be used as a reliable surrogate for detecting colistin resistance because in this study there was a low rate of categorical agreement between the MicroScan® colistin well and ETEST®. A future study is planned comparing these two testing methodologies with reference broth microdilution.

Disclosures. All authors: No reported disclosures.

2018. Performance of TEM-PCR vs. Culture for Bacterial Identification in Pediatric Musculoskeletal Infections

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Session: 234. Diagnostics – Bacterial Identification and Resistance
Saturday, October 7, 2017: 12:30 PM

Background. Musculoskeletal infections (MSI) in children require prompt diagnosis and treatment due to risk of local tissue damage and metastatic bacterial spread. Staphylococcus aureus is the leading cause of MSI and readily grows in culture; however, receipt of antibiotics prior to culture and the frequency of fastidious organisms in young children (e.g., Kingella kingdom) often leads to negative cultures and broad treatment regimens. Thus, there is a need for improved rapid diagnostics in children with MSI. In this study, we compared the detection of MSI pathogens by culture and by target-enriched multiplex PCR (TEM-PCR) in children with MSI.

Methods. Synovial fluid and bone samples were collected from patients with MSI (n = 25, 0.5–18 years). Bacterial cultures and antibiotic susceptibility testing (AST) was performed by the Vanderbilt University Medical Center clinical laboratory. Additionally, samples were evaluated by TEM-PCR for detection of S. aureus [including methicillin and clindamycin resistance genes and the Panton-Valentine leukocidin (PVL) locus], E. kinga, Haemophilus influenza, Streptococcus pyogenes, and Streptococcus pneumoniae.

Results. TEM-PCR detected a pathogen in 20/25 subjects (80%), compared with 17/25 (68%) by culture. S. aureus was identified in 18 subjects, one of which was identified by TEM-PCR and not by culture. TEM-PCR also identified 2 subjects with K. kinga infection; neither was identified by culture. TEM-PCR detection of methicillin resistance and clindamycin resistance was 100% concordant with AST in the clinical laboratory. Genes encoding PVL were identified in 8/18 (44%) S. aureus samples. No bacterial co-detections were identified, and no other pathogens were identified by TEM-PCR or culture. Finally, there were no subjects with positive bacterial cultures and negative TEM-PCR results.

Conclusion. Rapid diagnostic assays, such as TEM-PCR, may be useful adjuncts to conventional, culture-based testing for children with MSI. Advantages include rapid identification of pathogen and early detection of antibiotic resistance genes. In a single multiplex assay, TEM-PCR provided reliable identification of MSI pathogens, with the potential for informing antibiotic selection early in the disease course.


Beki Temba Magazi, MBChB1; Shameema Khan, MBChB2; Sipho Dlamini, MBChB3

Session: 234. Diagnostics – Bacterial Identification and Resistance
Saturday, October 7, 2017: 12:30 PM

Background. To better inform infection control and antibiotic stewardship programs, we investigated antimicrobial susceptibility trends and assessed the molecular characteristics of ESBLE, particularly of Escherichia coli (EC) and Klebsiella pneumoniae (KP) isolates, from patients with UTI treated at 6 local healthcare centers.

Methods. Consecutive isolates from 147 patients were sent to a central laboratory for species identification and drug susceptibility tests (Fig). Cochrane-Armstrong test was used to examine trends in susceptibility. EUCAST version 7.1 Minimum inhibitory concentration (MIC) interpretive criteria were used to identify susceptible isolates.

Results. All isolates were ESBLE-producers based on phenotypic tests. EC and KP were the most frequent organisms identified comprising 138/147 (90%) isolates. There was no significant association between organism and LOS (Fig). We did not find any blaba plasmid genes; however, blaTEM and blacm genes, which were encountered in CAI as frequently as they were in HAL, was present in 5/6 (83%) EC and KP isolates not susceptible to carbapenems. 9/10 (90%) isolates not susceptible to carbapenems were also not susceptible to quinolones.

Conclusion. Quinolones should be abandoned as empiric therapy for UTI with ESBLE. TZP is not an ideal substitute that can protect carbapenems in South Africa.