INTRODUCTION

• Extended-spectrum β-lactamases (ESBLs) were first identified in the early 1980s in Germany and has since been identified worldwide.

• Bacteria producing β-lactamases are increasingly reported as the cause of severe infections in intensive care- and surgical units.

• Mortality rates varying from 42% to 100% have been reported in patients infected by ESBL-producing bacteria.

• Most ESBL-producing bacteria can be divided into three groups: TEM, SHV and CTX-M types.

• Gram-negative β-lactamases are often mediated by bla\_SHV, bla\_CTX-M and bla\_TEM.

• Disk diffusion interpretive criteria is used for the detection of bacteria producing ESBLs.

• The choice of drugs for the treatment is limited to carbapenems for example imipenem, fluoroquinolones and aminoglycosides.

AIM

The aim of this study was to determine the prevalence of ESBLs in selected Gram-negative clinical bacterial isolates.

MATERIALS AND METHODS

• Fifty six (56) selected clinical bacterial isolates were obtained from clinical specimens sent from an academic hospital for analysis.

• The prevalence of bla\_SHV, bla\_CTX-M and bla\_TEM genes were determined in the following isolates (Table 1).

• Identification and antibiotic resistance was determined using the Vitek System (Vitek 2, bioMérieux, France).

Table 1: Clinical bacterial isolates obtained from Pretoria Academic Hospital (n=56)

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Amount of isolates (n=56)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klebsiella pneumoniae</td>
<td>33</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>14</td>
</tr>
<tr>
<td>Enterobacter cloacae</td>
<td>4</td>
</tr>
<tr>
<td>Morganella morganii ssp morganii</td>
<td>3</td>
</tr>
<tr>
<td>Citrobacter freundii</td>
<td>1</td>
</tr>
<tr>
<td>Proteus penneri</td>
<td>1</td>
</tr>
</tbody>
</table>

• The MagNApure LC Compact (Roche Applied Science, Germany) was used for the automated extraction of total DNA according to the manufacturer’s protocol.

• The Multiplex PCR assay was performed using the Qiagen Multiplex PCR Kit and a PX2 Thermal cycler (Thermo Electron Corporation, MA distributed by Scientific Group, SA) for the amplification of the DNA templates.

RESULTS AND DISCUSSION

• Multiplex PCR successfully detected the presence of bla\_SHV (747 bp), bla\_CTX-M (593 bp) and bla\_TEM (445 bp) genes (Figure 1).

• Multiple bla-genes were detected in 63% of all selected bacterial pathogens while 30% of the isolates only had a single bla-gene (Figure 2).

• In the remaining isolates no ESBL genes were detected.

CONCLUSION

Knowledge of the presence and prevalence of ESBL genes might assist in improved monitoring of these bacterial pathogens in hospital settings and to advice clinicians on possible treatment regimens.

REFERENCES
