FREQUENCY OF ESBL PRODUCING ENTEROBACTERIACEAE AND THEIR ANTIBIOTIC SENSITIVITY PATTERN

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INTRODUCTION
Resistant bacteria are emerging worldwide as a threat to the favorable outcome of common infection in community & Hospital setting. ESBL Enterobacteriaceae are now world wide problem resulting in major clinical crisis .First described in in mid 1980's and subsequently in western Europe in late 1980's ESBL's, even though they are found in variety of Enterobactericiiae species, the majority of ESBL producing strains are Kleb pneumoniae,Kleb oxytoca & E.coli.The frequency of ESBL production in other members of family Enterobacteriaceae is low.

AIM OF THE STUDY
To study the frequency of ESBL producing Enterobacteriaceae from different clinical sample and their antibiotic sensitivity pattern at our tertiary care centre.

MATERIALS & METHODS
Enterobacteriaceae isolated from different clinical samples, received during a period of six months from July 2009 to Dec2009 were subjected to screening of ESBL production and phenotypic confirmatory method.

Study period:June 2009—December 2009

During this period-
Total number of Bacterial isolates from different clinical samples- 836
Clinically significant GNB among these isolates were- 679
1. Enterobacteriaceae – 458
2. GNB (other than Entero) – 221

LABORATORY DETECTION OF ESBL.
All the Enterobactericiiae were identified by standard tecnic and AST was performed by Kirby Bauer method. The interpretation was done as per the recommendation by CLSI. When screening by AST showed ESBL production then further confirmation of ESBL was done by phenotypic confirmatory method, where in organism was considered an ESBL producers if there was a > 5mm increase in Zone diameter around Ceftazidime clavulinic acid disc (CaC-30 mcg)when compared to zone around Ceftazidime (Ca- 10 mc g)alone. Both the discs were from Himedia.

RESULTS
TABLE-1
The percentage of ESBL producing strains among the 458 isolates of Enterobacteriaceae

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TABLE-3

Location wise distribution of ESBL Producers

<table>
<thead>
<tr>
<th>Location</th>
<th>ESBL E.Coli</th>
<th>ESBL Kleb pneumoniae</th>
<th>ESBL Enterobacter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambulatory</td>
<td>248</td>
<td>24</td>
<td>8</td>
</tr>
<tr>
<td>Wards &amp; ICU</td>
<td>34</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

TABLE-4

Resistance pattern of the isolated ESBL producers

<table>
<thead>
<tr>
<th>ESBL E.Coli</th>
<th>ESBL Klebsiella pneumoniae</th>
<th>ESBL Enterobacter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amikacin</td>
<td>18%</td>
<td>40%</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>62%</td>
<td>80%</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>99%</td>
<td>87%</td>
</tr>
<tr>
<td>Nitrofurantoin</td>
<td>27.00%</td>
<td>91%</td>
</tr>
<tr>
<td>Zosin</td>
<td>15%</td>
<td>36%</td>
</tr>
<tr>
<td>Imipenem</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>Magnex</td>
<td>13%</td>
<td>40%</td>
</tr>
</tbody>
</table>

DISCUSSION

Initially ESBL strains were restricted to only Hospital acquired infections. They posed a major clinical challenge to Hospital infections. But nowadays increasing incidences of Catheter acquired infections are being recorded as in our study. Hence knowledge of resistant pattern in a geographical area becomes a necessity which
can guide us in appropriate, restricted and judicious use of Antibiotics.

Therefore a routine screening for ESBL production is a necessity today.  

With the spread of ESBL producing strains it is necessary to know the prevalence of ESBL positive strains in a hospital so as to form a Policy for Empirical therapy.

In our study the ESBL producing Enterobacteriaceae were E.coli, K.pneumoniae and Enterobacter spp. Other species which showed were Citrobacter & K. oxytoca. However they were infrequently isolated. None of the Salmonella & proteus produced ESBL in our setup.

E.coli was most frequent ESBL producer, which is in accord with many other studies

Indian studies statistics:
1. E.coli—19.5% to 72.3% (~70%) — (Our study -72%)
2. Klebsiella spp — 21.2% to 76.3% (~58%) --- (Our study -52%)
3. Enterobacter spp — 26.3% to 70.9% (~58%) —(Our study -64%)
4. Citrobacter spp — 30.5% to 72.7% --- (Our study 33%)
5. Proteus spp — 0% to 80%------ (Our study -0%)  

Maximum of ESBL E.coli were from Mid stream urine.  
ESBL Enterobacter & K. pneumoniae were from catheterized urine.

Majority of these ESBL isolates were from ambulatory patients

ESBL isolates showing Carbapenam resistance: 0 to 4%

CONCLUSION

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REFERENCE

