Introduction

High prevalence of carbapenemase-producing Enterobacteriaceae faecal carriage has been reported in the nosocomial setting in Tunisia. The aim of this study was to screen for the presence of carbapenemase-producing Enterobacteriaceae (CPE) in human carriers in community settings in Tunisia.

Materials and Methods

Study population = 1000 Tunisian healthy adult volunteers from whom one faecal sample was collected between 2013 and 2015.

Multidrug resistant Enterobacteriaceae screening: selective media

<table>
<thead>
<tr>
<th>Enrichment phase</th>
<th>Direct plating</th>
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<tbody>
<tr>
<td>Cefotaxime (2 μg/ml)</td>
<td>Ertapénème (0.25 μg/ml)</td>
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<tr>
<td>ESC-resistant Enterobacteriaceae*</td>
<td>Carbapenem-resistant Enterobacteriaceae</td>
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</tbody>
</table>

Identification and antibiogram

* : ESC : extended spectrum cephalosporins

Carbapenem genes: \( \text{bla}_{\text{OXA-48}}, \text{bla}_{\text{NDM}}, \text{bla}_{\text{KPC}} \) : PCR-sequencing

Plasmids: conjugation and PCR-based replicon typing

Results

Table 1: Faecal carriage rates of multidrug resistant Enterobacteriaceae:

<table>
<thead>
<tr>
<th>Rates</th>
<th>Nb specimens with ESC-resistant Enterobacteriaceae</th>
<th>Nb specimens with ESBL-producing Enterobacteriaceae</th>
<th>Nb specimens with cephalosporinase-hyperproducing Enterobacteriaceae</th>
<th>Nb specimens with CPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rates</td>
<td>237 (23.7 %)</td>
<td>192 (19.2 %)</td>
<td>45 (4.5 %)</td>
<td>4 (0.4 %)</td>
</tr>
</tbody>
</table>

Species

\( E. \text{coli} \) (166; 86%) 
\( K. \text{pneumoniae} \) (20; 10 %) 
Others (6; 3%)

E. coli (2)
K. Pneumoniae (2)

Molecular characteristics of CPE:

All the 4 isolates carried \( \text{bla}_{\text{OXA-48}} \) genes on InCl/M self-conjugative plasmids

One \( K. \text{pneumoniae} \) isolate harboured two plasmids, one carrying CTX-M15 and the other \( \text{bla}_{\text{OXA-48}} \).

One person carried two different antibiotic resistant isolates, one \( E. \text{coli} \) with \( \text{bla}_{\text{CTX-M-1}} \) and the other \( K. \text{pneumoniae} \) with \( \text{bla}_{\text{OXA-48}} \).

Conclusions

This study revealed a low prevalence of faecal carriage of carbapenemase-producing Enterobacteriaceae (0.4%). However, continuous surveillance is necessary to prevent the spread of carbapenemases within community settings in Tunisia like the spread of ESBL (19;2%).