Species belonging to family Enterobacteriaceae colonize mainly the gut of humans and animals. They cause both community- and hospital-acquired infections. Recently, carbapenem-resistant Enterobacteriaceae (CRE) has emerged as a global threat around the world. These emerging pathogens cause difficult-to-treat infections with high morbidity and mortality.

Materials and Methods

- A total of 100 non-repetitive rectal swabs, in duplicates, were collected from patients in the high dependency units of our hospital.
- They were investigated simultaneously by culture and the CGXA.
- The culture method was by direct inoculation on a MacConkey agar plate on which a 10 µg meropenem disk was placed and incubated in air at 37°C for 24 h.
- After overnight incubation, isolates identified as CRE were confirmed by PCR. CGXA was performed according to manufacturer’s protocol.
- Five isolates with known metallo-β-lactamase (MBL) genes were included in the assay.

Results

- General bio-data of the CRE-positive patients are given in Table 1.
- Of the 100 samples, 6 (6%) were positive for a carbapenemase gene, 5 of which were correctly detected by CGXA confirmed by PCR.
- They were 4 Klebsiella pneumoniae (positive for bla_KPC), 1 E. coli (bla_OXA48) negative by CGXA but positive by PCR, and 1 Enterobacter aerogenes (bla_KIM). See Table 2.
- The sensitivity and specificity of the CGXA, using the PCR assay as the reference test standard, were 80% and 98.9%, respectively.
- The prevalence of CRE colonization in our high-risk population by CGXA was 5%.
- All the 5 in-house positive control strains were correctly detected by CGXA.
- Non-recent travel history was significantly associated with CRE colonization (p=0.005).
- The turn-around-time from specimen to result was 1 h compared with culture and subsequent PCR of 48 h.

Conclusions

- With such performance, the CGXA can be readily incorporated into any busy routine clinical microbiology laboratory.
- The rapid detection of CRE harboring MBL genes directly from rectal swabs within 1 h should assist in optimizing decision-making on contact-precautions and early detection of outbreaks within the hospital.

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