CHROMagar evaluation for detection of carbapenemase producing Enterobacteriaceae
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OBJECTIVES
Our aim was to compare CHROMagar KPC with MacConkey agar with imipenem 1µg/mL for the detection of KPC and VIM producing Enterobacteriaceae strains from surveillance cultures. Methods: 135 rectal swabs from 120 patients (78 ICU and 42 pathologic wards) were tested. Swabs were plated on both MacConkey agar with imipenem 1µg/mL (MC) and CHROMagar KPC (Hyb labs) (CR) and were incubated at 35°C, O2 for 48h. Identification and antimicrobial susceptibility testing of all different colonies from MC and CR were performed by Phoenix (BD), Strains were screened for KPC and VIM by meropenem-hydrochloric acid and meropen-EDTA, cefazidime-EDTA disc respectively and confirmed by PCR methodology. Isolation of Enterobacteriaceae on CR was also tested with known VIM- and KPC- Enterobacteriaceae strains (41 KPC+, 13 VIM+), isolated the first day of incubation. KPC+ strains were 100% non-susceptible to imipenem (MIC=6µg/ml) and 96.3% to meropenem (=4µg/ml). VIM+ strains were 93.3% non-susceptible to imipenem and to meropenem (=4µg/ml), and 53.3% to meropenem. Enterobacter spp. strains were not isolated, most probably due to the coexistence of KPC+ and VIM+ strains in the sample (same colonies). On the contrary, in 10 out of 14 false (-) results on CR there was no growth of lac+ colonies, although strains imipen MIC was within non-susceptible range, MC and CR detected carbapenemase producing K. pneumoniae strains with an overall sensitivity 80.4%, 100 and specificity 97.6%, 100 respectively, allowing immediate implementation of infection control measures to avoid spread of resistant clones.

RESULTS

\[ \text{Colonies appearance on CHROMagar} \]

All false (-) results on CR and four out of fourteen false (-) results on MC+imp were due to the coexistence of VIM+ and KPC+ K.pneumoniae strains in the sample (same colonies).

In the remaining 10 false (-) results on MC+imp, there was no growth of lac+ colonies, although imipen MIC of the strains was within non-susceptible range.

Enterobacter spp. strains were not isolated on CR, most probably due to the resemblance of their colonies to the coexisting K.pneumoniae strains. P.mirabilis strains did not grow on CR.

Conclusions: CHROMagar detects with 100% sensitivity and specificity, within 24h, either KPC or VIM producing Enterobacteriaceae strains in surveillance cultures, allowing immediate implementation of infection control measures to avoid spread of resistant clones.

REFERENCES
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INTRODUCTION
Carbapenem resistant Enterobacteriaceae (CRE) infection is a worldwide problem associated with high rates of morbidity and mortality, particularly among critically ill patients (1,2). Patients carrying CRE are thought to be the source of transmission in the health care settings (3,4). Surveillance cultures are useful in identifying those patients in order to implement infection control measures.