

Evaluation on Effectiveness of Colloidal Gold Immunochromatography Assay for Rapid Detection of Carbapenemase-producing *Enterobacteriaceae*

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BACKGROUND

- The identification, treatment, and control of carbapenem-resistant *Enterobacteriaceae* (CRE) infections are a major challenge for health care institutions and diagnostic laboratories worldwide.
- A novel Carbapenemase-producing Bacteria Test Kit (Lateral Flow Assay) from Dynamiker Biotechnology (Tianjin) Co., Ltd. is a qualitative test that was easy to operate and can detect double and multiple carbapenemase types in just 15 minutes (Fig. 1).
- We analyzed the effectiveness of Dynamiker carbapenemase-producing bacteria test kit for rapid detection of CRE carbapenemase.

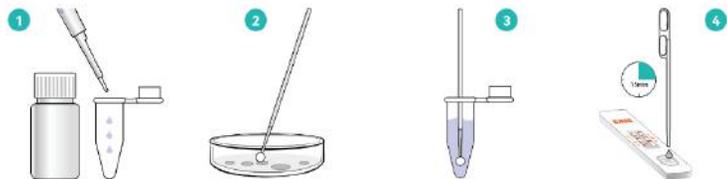


Fig. 1 Operating procedures of colloidal gold immunochromatography

METHODS

- A total of 120 strains of *Enterobacteriales* in blood culture were collected, including 80 strains of CRE and 40 strains of CSE (carbapenem-susceptibility *Enterobacteriaceae*). PCR was used to detect KPC, NDM, IMP, VIM and OXA-48 genes as gold standard.
- Dynamiker carbapenemase-producing bacteria test kit was used to detect the carbapenemase produced by CRE, which was conducted by the performance evaluation combined with PCR results.

RESULTS

The 80 strains of CRE expressing carbapenemase genes were all positive for the detection of carbapenemase by Dynamiker carbapenemase-producing bacteria test kit, which includes 39 strains producing KPC, 26 strains producing NDM, 8 strains producing IMP, 5 strains producing VIM and 2 strains producing OXA-48 enzymes; the 40 strains of CSE were negative and no carbapenemase were detected. Compared with the PCR results, the sensitivity and specificity of the four enzymes by Dynamiker carbapenemase-producing bacteria test kit were both 100% (Fig. 2).



Fig.2 Results of Dynamiker carbapenemase-producing bacteria test kit
C: Control, K: KPC, N: NMD, I: IMP, V:VIM, O:OXA-48

CONCLUSION

Dynamiker carbapenemase-producing bacteria test kit can be applied as a simple, rapid, sensitive and specific diagnostic method for the detection of different CRE carbapenemase types, which is of great value for the accurate use of clinical anti-infective therapy.