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Detection of carbapenemases in *Enterobacteriaceae*: a challenge for diagnostic microbiological laboratories

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ABSTRACT

Carbapenemase-producing bacteria have been spread all over the world the last period. Infections caused by those bacteria are difficult to threat. Therefore, there is an urgent need for an accurate and fast diagnosis of carbapenemases in diagnostic laboratories. In this review, we summarized screening methods for suspected isolates, direct assays for confirmation carbapenemase activity (e.g., Carba NP test, MALDI-TOF MS carbapenem-hydrolysis assay), inhibitor-based methods for carbapenemase classification and molecular genetic techniques for precise identification of carbapenemase genes. We also proposed a workflow for carbapenemase identification in diagnostic laboratories.

INTRODUCTION

The progress in human medicine, especially in surgery, transplantatology, neonatology, haemato-oncology and intensive medicine has been redeemed by prolonged hospitalization, excessive and long term antibiotic treatment of patients enfeebled by immunodeficiencies and invasive procedures. In the environment of intensive care units (ICUs), incubators and haemato-