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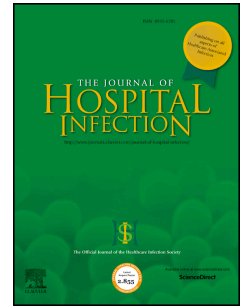
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Multidrug-resistant Gram-negative bacteria: a product of globalization

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SUMMARY

Global trade and mobility of people has increased rapidly over the last 20 years. This has had profound consequences for the evolution and the movement of antibiotic resistance genes. There is increasing exposure of populations all around the world to resistant bacteria arising in the emerging economies. Arguably the most important development of the last two decades in the field of antibiotic resistance is the emergence and spread of extended-spectrum β -lactamases (ESBLs) of the CTX-M group. A consequence of the very high rates of ESBL production among Enterobacteriaceae in Asian countries is that there is a substantial use of carbapenem antibiotics, resulting in the emergence of plasmid-mediated resistance to carbapenems. This article reviews the emergence and spread of multidrug-resistant Gram-negative bacteria, focuses on three particular carbapenemases – imipenem carbapenemases, *Klebsiella pneumoniae* carbapenemase, and New Delhi metallo- β -lactamase – and highlights the importance of control of antibiotic use.

Keywords:

Antibiotic resistance

Carbapenemases

CTX-M ESBLs

Extended-spectrum β -lactamases

Global trade

Multidrug-resistant Gram-negative bacteria

Introduction

Global background

There has been a massive increase in global trade over the last 20 years, especially with the rapidly emerging nations of China and India. In 2008 more than US\$800 billion of

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