

International travel increasing spread of new drug-resistant bacteria: Is this the end of antibiotics?

August 10 2010

A new gene (New Delhi metallo- β -lactamase [NDM] 1) that enables bacteria to be highly resistant to almost all antibiotics is widespread in Enterobacteriaceae taken from patients in India and Pakistan, and has also been found in UK patients who travelled to India for elective surgery, according to an Article published Online First and in the September edition of *The Lancet Infectious Diseases*. The rapid emergence of these multi-drug resistant NDM-1 producing bacteria and their potential worldwide spread could herald a period in which antibiotics become redundant and demands very close international monitoring and surveillance.

In 2009, Timothy Walsh from Cardiff University in the UK and international colleagues first identified the NDM-1 gene in *Klebsiella pneumoniae* and *Escherichia coli* bacteria taken from a Swedish patient admitted to hospital in India. Worryingly, NDM-1-producing bacteria are resistant to many [antibiotics](#) including carbapenems, a group of antibiotics generally reserved for use in emergencies and the treatment of infections caused by multi-resistant bacteria.

In this study, the authors investigated how common the NDM-1 producing antibiotic resistant bacteria are in Bangladesh, India, and Pakistan and the importation of these bacteria into the UK via patients returning from these countries.

The researchers collected bacteria samples from patients presenting with various hospital and community-associated infections in Chennai and Haryana in India, and from patients referred to the UK's national reference laboratory between 2007 and 2009. Samples were tested for antibiotic susceptibility and the presence of the NDM-1 gene using polymerase chain reaction (PCR) and sequencing.

They identified 44 (1.5%) NDM-1-positive bacteria in Chennai, 26 (8%) in Haryana, 37 in the UK, and 73 in other sites in Bangladesh, India, and Pakistan. NDM-1 was mostly found in *E coli* (36), the most common cause of community-associated urinary tract infections, and *K pneumoniae* (11). The NDM-1-producing bacteria were highly resistant to all antibiotics except tigecycline and colistin. In some cases, isolates were resistant to all antibiotics.

Importantly, the NDM-1 gene was found to be present on plasmids, DNA structures that can be easily copied and transferred between different bacteria, suggesting: "an alarming potential to spread and diversify among bacterial populations".

The authors say that the emergence of NDM-1 positive bacteria is potentially a serious global public health problem as there are few new anti-Gram-negative antibiotics in development and none that are effective against NDM-1. Consequently, we are facing a period in which antibiotics become redundant. They go on: "Even more disturbing is that most of the India isolates from Chennai and Haryana were from community-acquired infections, suggesting that NDM-1 is widespread in the environment."

They conclude by pointing out that several of the UK NDM-1 positive patients had travelled to India or Pakistan for surgical procedures (including cosmetic) within the past year: "India also provides cosmetic surgery for other Europeans and Americans, and it is likely NDM-1 will

spread worldwide."

In a Comment, Johann Pitout from the University of Calgary in Canada warns that patients who have medical procedures in India should be screened for multiresistant [bacteria](#) before they receive care in their home country: "If this emerging public health threat is ignored, sooner or later the medical community could be confronted with carbapenem-resistant Enterobacteriaceae that cause common infections, resulting in treatment failures with substantial increases in health-care costs."

Provided by Lancet

Citation: International travel increasing spread of new drug-resistant bacteria: Is this the end of antibiotics? (2010, August 10) retrieved 10 April 2024 from <https://medicalxpress.com/news/2010-08-international-drug-resistant-bacteria-antibiotics.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--