



感染控制處

衛生防護中心  
Centre for Health Protection

Infection Control Branch

本署檔號 **Our Ref.** : ( ) in DH ICB/12-22

來函檔號 **Your Ref.** :

電話 **Tel.** : 2125 2925

傳真 **Fax No.** : 3523 0752

12 August 2010

Dear Doctor,

**Emergence of New Delhi metallo- $\beta$ -lactamase 1 (NDM-1) producing *Enterobacteriaceae***

I would like to draw your attention to a recent article on the emergence of a new antibiotic resistance mechanism conferred by New Delhi metallo-beta-lactamase 1 (NDM-1) enzyme among Gram-negative *Enterobacteriaceae* found in India, Pakistan and the UK.

NDM-1 is an enzyme which can inactivate carbapenems (e.g. imipenem, meropenem) and other beta-lactams (e.g. penicillins, cephalosporins). It is thus an enzyme with broad-spectrum activity. The gene encoding for the enzyme is mainly found in Gram negative bacteria belonging to the family *Enterobacteriaceae* (e.g. *E. coli*, *Klebsiella spp.*, etc.) Bacteria harboring this NDM-1 gene are commonly resistant to multiple other antimicrobials, limiting therapeutic options and rendering severe clinical infections difficult to treat.

NDM-1 producing *Enterobacteriaceae* was first reported as causing urinary tract infection in a Swedish patient of Indian origin who travelled to New Delhi, India in 2008.<sup>1</sup> Subsequent growing incidence of NDM-1 strains in India, Pakistan, and UK (totally 180 bacterial isolates mostly found among *Escherichia coli* and *Klebsiella pneumoniae*) has been reported in the Lancet recently. You may wish to visit the link for full article:  
<http://www.thelancet.com/journals/laninf/article/PIIS1473-3099%2810%2970143-2/abstract>



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The Health Protection Agency, Department of Health, UK issued a National Resistance Alert in 2009 and urged hospitals to be vigilant of multi-resistant gram-negative bacteria in patients with recent hospital contact in the Indian subcontinent as well as the Eastern Mediterranean. Please refer to the HPA weblinks for more details:  
<http://www.hpa.org.uk/hpr/archives/2009/news0409.htm#enterora>  
<http://www.hpa.org.uk/hpr/archives/2009/news2609.htm#ndm1>

In Hong Kong, the PHLSB of CHP had been monitoring the antibiotic resistance pattern of bacteria. In the PHLSB, one case of infection with a strain of *E. coli* harbouring NDM-1 was detected from a urinary specimen of a 66-year old male patient sent from a government out-patient clinic in October 2009. The organism was non-susceptible to imipenem and other beta-lactam antibiotics, aminoglycosides and co-trimoxazole. It was susceptible to oral agents commonly used to treat urinary tract infections, including nitrofurantoin, nalidixic acid and levofloxacin. The patient had fully recovered from urinary tract symptoms after a course of ciprofloxacin.

If you encounter any clinical case suspicious of infection caused by NDM-1 strains, you may contact Dr Janice Lo, Consultant Medical Microbiologist, Public Health Laboratory Service Branch (PHLSB), CHP at telephone no: 2319 8254 for advice and arrangements in laboratory testing.

To prevent emergence and cross transmission of this organism, you are advised to pay attention to rational use of antibiotics and to educate your patients on proper use of antibiotics and personal hygiene. Hand hygiene is of utmost importance. For more information on the proper use of antibiotics, please visit CHP website: [http://www.chp.gov.hk/en/guideline\\_infection/346.html](http://www.chp.gov.hk/en/guideline_infection/346.html). For hospitalized patients with confirmed infections caused by this organism, you may contact the Infection Control Team of the hospital or Infection Control Branch for further advice on infection control issues.

Yours faithfully,



(Dr TY WONG)  
Head, Infection Control Branch  
Centre for Health Protection  
Department of Health

Reference:

1. D. Yong, M. A. Toleman, C.G. Giske. Characterization of a New Metallo-Lactamase Gene, blaNDM-1, and a Novel Erythromycin Esterase Gene Carried on a Unique Genetic Structure in *Klebsiella pneumoniae* Sequence Type 14 from India. *Antimicrobiol agent and Chemotherapy* 2009; 53(12):5046-54



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