

## Correspondence

### **Metallo- $\beta$ -lactamase 1 - why blame New Delhi & India?**

Sir,

Tumult in the recent past concerning proclaimed 'superbug' following an article published in the Lancet Infectious Diseases<sup>1</sup> and the subsequent publication of another article in Lancet<sup>2</sup> has created anguish in medical fraternity and the Government. Authors in their remarks have singled out and made India as the focal point of global interest on antibiotic resistance. The Indian Government protested the conclusion of the study was considered "unfair". On January 12, 2011, the editor of the Lancet acknowledged that naming the 'superbug' after New Delhi was an "error"<sup>3</sup>.

Multifocal outbreaks of metallo- $\beta$ -lactamase-producing *Pseudomonas aeruginosa* resistant to carbapenems were identified during 1992 to 1994 in Japan<sup>4</sup>. The *Klebsiella pneumoniae* carbapenemase (KPC) currently a common carbapenemase, was first detected in North Carolina, USA, in 1996 and has since spread worldwide<sup>5</sup>. A later study indicated that members of *Enterobacteriaceae* that produce KPC were becoming common in the United States.<sup>6</sup> Carbapenems are a class of beta-lactam antibiotics currently recommended as a first-line therapy for severe infections caused by bacteria of *Enterobacteriaceae*-producing extended spectrum beta lactamases (ESBLs)<sup>7</sup>. Carbapenemases are particularly dangerous as these can inactivate a wide range of antibiotics. In such cases, one is left with little option of using polymixins and tigecycline.

The New Delhi metallo beta-lactamase-1 (NDM-1) enzyme was named after New Delhi, the capital city of India, because it was first described by Yong *et al*<sup>8</sup> in December 2009 in a Swedish national who fell ill with an antibiotic-resistant bacterial infection that he possibly acquired in India. Undoubtedly, the impact of activity of NDM-1 is threatening as today we may not have potent and effective antibiotics to treat such patients. There is also danger of spread of such infections due to poor

disinfecting practices. Further, such episodes can cause scare in the mind of people interested in International travel and medical tourism.

*Enterobacteriaceae* isolates harbouring NDM-1 have now been found in multiple areas of India and Pakistan and in the United Kingdom<sup>1</sup>. Such isolates have also been recently reported from three US States<sup>9</sup>. The Lancet study<sup>1</sup> selectively identified Gram-negative *Enterobacteriaceae* with resistance to carbapenem and named it as NDM-1 isolated from Guwahati, Mumbai, Varanasi, Bangalore, Pune, Kolkata, Hyderabad, Port Blair, and New Delhi in India, eight cities (Charsadda, Faisalabad, Gujrat, Hafizabad, Karachi, Lahore, Rahim Yar Khan, and Sheikhpura) in Pakistan, and Dhaka in Bangladesh suggesting widespread dissemination. It has been concluded that the cases who were found NDM-1 infected, had travelled to Asian countries and acquired infection while on treatment<sup>1</sup>. Recently such a case has been reported in Canada who had never travelled outside Ontario State in the last decade but acquired NDM-I infection. No family members or friends had any relevant history of travel. The authors have concluded that this was the first reported instance in which an NDM-1 producing organism was locally acquired in Canada<sup>10</sup>.

There are similar reports without any relationship to India reported from Serbia<sup>11</sup>, from Iraq and Georgia (soldiers who were injured either during the Iraq war in 2007 and during the Georgian-Russian war in 2008)<sup>12</sup> and Italy<sup>13</sup>. There is also a report of unexpected similarity between antibiotic-resistant NDM-1 and beta-lactamase II from *Erythrobacter litoralis*<sup>14</sup>. One does not know whether similar findings can be extrapolated from other cities of the world as these studies are from highly selective areas and do not represent the entire population of the world.

The Lancet paper<sup>1</sup> which has initiated the debate and created the commotion concerning the

'superbug' NDM-1 seems to have many flaws. Claims of environmental distribution of bacteria carrying the NDM-1 gene in New Delhi<sup>2</sup> may be genuine but the study does not exclude probability of the similar findings across the globe. The samples were neither representative of Indian nor world population, the study design was inappropriate to establish a causal link. The authors have not utilized data from Pakistan in their analysis. Thus it was felt that the title of the study was misleading. The presence of NDM-1 gene was similarly distributed among those who had the exposure in India and those who did not.

The first genetic description of NDM-1 came in light in 2008 in Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) in USA, followed by a subsequent publication in December 2009<sup>7</sup>. Toleman and Walsh were perhaps instrumental in new nomenclature targeting New Delhi and India in their first publication<sup>7</sup> and propagated it further through their other publications<sup>1,2,15,16</sup>. So the metallo- $\beta$ -lactamase producing *Enterobacteriaceae* resistant to carbapenems may not have originated from India.

Although in the past new discoveries were named after the location/country, the trend of pointing a nation is no more in practice. The 2009 H1N1 influenza was not named after the country/region (California) from where H<sub>1</sub>N<sub>1</sub> was reported<sup>17</sup>. The novel SARS Corona virus was also not named after the province or the nation (first reported in late 2002 from Guangdong Province, China)<sup>18</sup>. "Mongolism" was renamed to Down's syndrome<sup>19</sup>; so also "Australia" antigen to HBsAg<sup>20</sup>.

It is strongly felt that the organisms should not be named after cities, countries and races. The nomenclature should be based on their scientific characteristics. The global scientific community or International Nomenclature Committee is urged to rename NDM in a scientific way. We should replace the irrational name with a suitable scientific nomenclature in our further publication<sup>20</sup>. To begin with, no scientific document/study from India should quote the term 'NDM' nor use it as a 'key word'.

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