

The gene that encodes for New Delhi metallo-beta-lactamase-1 (*NDM-1*), which confers resistance to most currently available antibiotics, appears to be spreading from the Indian subcontinent (India, Pakistan, and Bangladesh), researchers reported here at a media press conference during the 50th Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC).

*NDM-1* has recently been documented in strains of bacteria in Australia, France, Japan, Kenya, North America, Singapore, Taiwan, and the United Kingdom. The emergence of this gene poses the threat of a pandemic with few treatment choices, said researchers.

In 2 separate reports at ICAAC, investigators described cases of *NDM-1* in *Escherichia coli* in Canada and in *Klebsiella* sp. in Australia, prompting the news conference. Both case reports involved patients who had recently traveled to India. No one really knows the true prevalence of *NDM-1*-infiltrated bacteria, the researchers said, but they believe that the spread from India to other parts of the world is at least partly due to a confluence of a large Indian diaspora returning to their homeland for visits and to the phenomenon of medical tourism to India.

"The reservoir is in India, Pakistan, and Bangladesh, and is due to factors that are not controllable - overuse of antibiotics, poor hygiene, and diarrhea in an overcrowded overpopulated country. A plague could spread around the world, first through the Indian diaspora, which constitutes 20 million people all over the world," warned Patrice Nordmann, MD, from the Hôpital de Bicêtre, Le Kremlin-Bicêtre, France. "We feel it's only a question of time." Dr. Nordmann was a panelist at the press conference.

It is not known how widespread *NDM-1* is in India, "which is one of our greatest concerns," added Timothy Walsh, MD, from Cardiff University in the United Kingdom.

"Our data are not accurate, but there are billions of people in India without clean water and sanitation. Massive antibiotic usage and antibiotics in the sewage create a nightmare that is a perfect recipe. Selective pressure fuels antibiotic resistance, and bugs are put on hyperdrive to accept DNA with *NDM-1* encoded in plasmids," Dr. Walsh said.

Since the abstracts describing the 2 case reports of *NMD-1*-associated resistance were submitted to the ICAAC, other cases have emerged in Australia and Canada. Culture of the infection in Canada revealed the same strains of *NMD-1 E coli* identified in the United Kingdom and India. In the Australian case, *NDM-1* was present in *Klebsiella pneumoniae* isolated from a foot wound.

"Both patients in Canada were treated successfully, but according to lab tests, only 3 antibiotics were found to have any effect - tigecycline, colistin, and phosphomycin," said senior author of that abstract, Johann Pitout, MD, from the University of Calgary in Alberta.

Perhaps more important is the fact that general practitioners are not used to seeing multidrug resistance associated with *NDM-1*, and if this type of infection does become common, infected patients may not get appropriate treatment, Dr. Pitout stated. "General practitioners are not qualified to treat these infections," he asserted.

What can general physicians do? "My only advice is that physicians should be suspicious of potential *NDM-1*-related infection in a patient who has recently traveled to India and been hospitalized there," Dr. Pitout said.

Participants at the press conference agreed that global policies are needed for antibiotic use and surveillance. "The World Health Organization has no policies for antibiotic resistance and no network for worldwide surveillance. We have the tools and we can do surveillance. We need a few labs worldwide to identify these bugs online," Dr. Nordmann said.

France is planning to start screening for the *NDM-1* gene in patients transferred to hospitals after medical treatment on the Indian subcontinent, Dr. Nordmann said. Panelists agreed that other countries with an Indian diaspora should consider this.

Currently, no available drug inhibits bacteria that carry *NDM-1*. One or 2 compounds look promising, Dr. Walsh said, "but we need at least 6 or 8. If a drug that works is marketed in 2 years time, it could be used like sweets."

*Dr. Nordmann, Dr. Walsh, and Dr. Pitout have disclosed no relevant financial relationships.*

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