

Multidrug-Resistant Tuberculosis

[Announcer] This podcast is presented by the Centers for Disease Control and Prevention. CDC — safer, healthier people.

[Ted Pistorius] Hello, I'm Ted Pistorius, speaking today with Dr. John Oeltmann, an epidemiologist with the Division of Tuberculosis Elimination here at CDC. We're here to talk about an article in the November 2008 issue of Emerging Infectious Diseases reporting upon multidrug-resistant tuberculosis, which is also known as MDR TB. So John, can you tell me a little about MDR TB?

[John Oeltmann] MDR TB is TB that is resistant to at least two of the best anti-TB drugs, isoniazid and rifampin. These drugs are considered first-line drugs and are used to treat all persons with TB disease. Treating MDR TB is more complex and can take up to 2 years to treat versus 6 months of treatment for drug-susceptible TB. To some extent, MDR TB is man-made because of misused or mismanaged antibiotics. For example, if someone with TB doesn't take the full course of drugs or health care providers prescribe the wrong treatment, then MDR TB can be the result. To improve adherence in the U.S., we recommend the use of directly observed treatment, or DOT, for all patients with TB. DOT is where a health care provider or another designated person watches the patient take each dose of their medication. DOT is expensive but should always be used in the treatment of drug-resistant TB to ensure adherence.

[Ted Pistorius] Thanks, John. So why should we be concerned about MDR TB?

[John Oeltmann] MDR TB is much more complex to treat, and mortality rates are higher with MDR TB than with drug-susceptible TB. The drugs used to treat MDR TB are more costly and more toxic than traditional isoniazid- and rifampin-based regimens used to treat drug-susceptible TB. Around the world, approximately 5 percent of the 9.2 million new cases of TB each year are estimated to be MDR TB and cause more than 130,000 deaths.

[Ted Pistorius] So tell us a bit about your investigation?

[John Oeltmann] CDC responded to this public health problem in early 2005. Refugees from central Thailand were resettling to the U.S. and arriving in California. They had been screened for TB before coming to the U.S., but they were being rescreened upon arrival in California where TB was diagnosed in some of the refugees. After drug susceptibility testing was performed, it was discovered that several of these refugees had MDR TB. Resettlement was temporarily halted while CDC sent a team to the refugee camp to investigate factors that led to the emergence and dissemination of MDR TB among these refugees. In camp, living conditions were conducive to TB transmission; that is, it was crowded and homes were poorly ventilated. Families lived in one-room, self-made homes with an average of five persons per home. Homes did not often have windows. We identified 272 TB cases among the remaining 6,000 refugees in the camp, many of which were later confirmed to be MDR TB. We interviewed MDR TB patients and learned that most of them were socially linked. TB genotyping was performed to determine if the MDR TB cases were the same strain, which could suggest recent transmission or an outbreak. We interviewed patients about taking TB medications in the past, and if so, if they received DOT. In the end, all patients were required to receive DOT, mechanisms were

developed to import quality-assured, second-line TB medications, and nurses and physicians in camp received advanced training in TB diagnostics and treatment.

[Ted Pistorius] So what did you conclude from this?

[John Oeltmann] Because the MDR TB patients were socially linked to each other and the MDR TB strains were in fact all similar, the main conclusion was that an outbreak of MDR TB had occurred in a camp already characterized by elevated rates of TB. None of the few patients that took anti-TB medications in the past reported previous treatment with DOT, so perhaps, improper use of antibiotics in the past led to this MDR TB outbreak. However, the large number of MDR TB patients at the time of the investigation appeared to be the result of person-to-person transmission or an outbreak among the refugees. The outbreak took place during resettlement to the U.S., which led to importation of MDR TB. As a result, the TB screening algorithm used in camp was enhanced to help prevent the importation of TB and MDR TB into the United States.

[Ted Pistorius] Seems quite significant; so what can be done to protect our communities from getting MDR tuberculosis?

[John Oeltmann] The most important thing we can do to protect people and communities is to prevent MDR TB from developing in the first place. We can do this by strengthening general TB control by ensuring rapid diagnosis and appropriate treatment with DOT to reduce the risk of transmission or the development of MDR TB.

[Ted Pistorius] What about vaccines for TB?

[John Oeltmann] A vaccine is used in some countries, but it is not effective in preventing TB in adults, and it is not routinely recommended for anyone in the U.S. However, a substantial amount of research is currently being conducted to develop an effective vaccine.

[Ted Pistorius] Did your study change the screening process for immigration into the United States?

[John Oeltmann] Yes. This is the biggest effect of the study. CDC has developed a new screening process that includes mycobacterial culture and drug susceptibility testing that is more likely to detect TB in its earliest stages and will increase our ability to find drug-resistant cases. Our investigation suggested that the new screening algorithm will help us find more TB cases before resettlement to the U.S. Eventually, all refugees and immigrants will be screened with the new TB screening algorithm. It is still being rolled out and is currently in place in 15 countries. Ongoing surveillance in the U.S. will help us determine the effects of this effort.

[Ted Pistorius] So what's the public health importance of this study?

[John Oeltmann] This outbreak reminded us how small the world is. An outbreak of a serious and potentially fatal illness occurred in Thailand, and in a very short period of time, resulted in more than 45 cases of TB in the U.S. TB is a global epidemic with more than nine million people

diagnosed annually; therefore, TB anywhere can become TB here. Controlling TB in the U.S. will require a global effort.

[Ted Pistorius] Our discussion with Dr. John Oeltmann was prompted by an article in the November 2008 issue of Emerging Infectious Diseases. These articles, and others on emerging bacterial and viral diseases, can be read online at www.cdc.gov/eid. Again, that's www.cdc.gov/eid. And you can submit your comments on this interview to eideditor@cdc.gov. That's eideditor—one word—at cdc.gov. For Emerging Infectious Diseases, I'm Ted Pistorius.

[Announcer] For the most accurate health information, visit www.cdc.gov or call 1-800-CDC-Info 24/7.