

## Tall and Thin Not So Great for Mycobacterial Disease

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DENVER — Tall, thin women face a greater risk of infection with [nontuberculous mycobacteria \(NTM\)](#), cousins of the organism that causes tuberculosis, according to researchers at National Jewish Health. Women with NTM infections also showed a weakened immune response associated with their fat cells, in a paper published in the current issue of *The American Journal of Respiratory and Critical Care*.

“Nontuberculous mycobacteria are widespread in the environment, yet only some people develop infections,” said Edward Chan, MD, senior author and professor of medicine at National Jewish Health. “These findings help us identify who is at greater risk for the disease, and may point to more effective therapies down the road.”

There are dozens of NTM species. Although the organisms can infect skin and other body parts, they most commonly infect the lungs. Lung infections are very difficult to treat, often requiring surgery and years of therapy with powerful intravenous antibiotics. NTM infections can be fatal. Evidence suggests that infections have been rising in recent decades.

NTM species are widespread in water and soil, yet only about five to six people per 100,000 develop NTM infections each year; the incidence is higher in individuals older than 50. An estimated 30,000 to 120,000 people in the US currently have NTM infections. Researchers at National Jewish Health, which sees more NTM infections than any other medical center in the world, tried to figure out why only some exposed patients develop these difficult infections.

Elderly women represent the vast majority of NTM patients, accounting for 85 percent of the patients seen at National Jewish Health during the study, and averaging about 64 years of age. The researchers chose to compare the NTM patients with control subjects at an osteoporosis clinic because these individuals were similar age, race, and gender as the NTM patients.

When compared to the women visiting the osteoporosis clinic, the NTM patients were on average almost two inches taller, had body mass indices almost two points lower and 5.7 pounds less fat on their bodies. The NTM patients also more frequently had concave chests, a condition known as pectus excavatum, and scoliosis, or curvature of the spine.

“Tall, thin women definitely appear to be more susceptible to NTM infections,” said Dr. Chan. “They share some characteristics of people with Marfan syndrome. Since Marfan syndrome is caused by a mutation in the *fibrillin-1* gene, we plan to look at that gene as a potential source of NTM susceptibility.”

In addition to body type, NTM patients also differed in their immune response. Fat cells produce hormones, leptin and adiponectin, known to regulate both weight and immune function. Leptin production generally increases as people grow fatter. It also helps stimulate the immune system to fight infections. Adiponectin, an immunosuppressive hormone, generally decreases as people grow fatter. While these standard relationships held for the control subjects, they broke down for NTM patients with levels of these fat-derived hormones varying only minimally with body fat in NTM patients.

“In addition to body type, NTM patients also appeared to have some dysregulation of their immune response, which could increase their susceptibility to NTM infections,” said co-author Michael Iseman, MD, professor of medicine at National Jewish Health.

**National Jewish Health** is known worldwide for treatment of patients with respiratory, cardiac, immune and related disorders, and for groundbreaking medical research. Founded in 1899 as a nonprofit hospital, National Jewish Health remains the only facility in the world dedicated exclusively to these disorders. *U.S. News & World Report* has ranked National Jewish the #1 respiratory hospital in the nation for 15 consecutive years.

**National Jewish Health** is the leading respiratory hospital in the nation. Founded 121 years ago as a nonprofit hospital, National Jewish Health today is the only facility in the world dedicated exclusively to groundbreaking medical research and treatment of patients with respiratory, cardiac, immune and related disorders. Patients and families come to National Jewish Health from around the world to receive cutting-edge, comprehensive, coordinated care. To learn more, visit the media resources page.

## Media Contacts

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