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## TB Screening Strategies: Is It Time to Update Our Approach?

Announcer:

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Your host is Dr. John Russell.

Dr. Russell:

Despite the decline in active cases of tuberculosis in the United States over the past 25 years, there were still over 9,000 TB cases reported in the past year alone. This may come as a shock considering the screening tools that are available in this country. So, what are we overlooking in our screening practices, and how can we better address this health threat for our patients?

This is Reach MD, and I'm Dr. John Russell. Joining me to talk about our best practices for TB screening is Dr. Lee Reichman, founding Executive Director of the Rutgers Global Tuberculosis Institute and Professor of Medicine in Epidemiology at Rutgers New Jersey Medical School in Newark, New Jersey.

Dr. Reichman, welcome to the program.

Dr. Reichman:

Thank you.

Dr. Russell:

Now, as I mentioned earlier, it's clear that active TB rates have declined over the years, but there are still many people who are diagnosed with TB each year. Can you speak a little further to that persistent burden of disease in the United States and why it's so difficult to eliminate nationwide?

Dr. Reichman:

Well, thank you for the question. Tuberculosis is a giant infectious disease. Actually, it's the biggest killer of any single infectious disease in the world. It's the biggest killer of AIDS patients worldwide. And even in a so-called developed nation like the United States, there are still pockets of people at high risk. It's a 2-stage disease. Someone gets infected with a tubercle bacillus. That means they carry the bug around them until something happens. They get immunosuppressed, they get some kind of stress or something happens that we don't know, and then that manifests itself into active infectious tuberculosis. So, even though there are probably about 9,000 active infectious tuberculosis patients in the United States as we speak, there are about 12 million people who are infected with the bug who are at variable risk of coming down with active infectious tuberculosis.

Dr. Russell:

So, doctor, from a guidelines perspective, it seems that most updated recommendations support an aggressive approach to screening for latent TB infections. How did that recommendation come into focus, and has it been an effective approach in your view?

Dr. Reichman:

I think the recognition in the United States now that we have a low number, a little more than 9,000 cases of active tuberculosis, and since we now know that most of these occur in risk groups and they occur from a pool of people who have already been infected with the tubercle bacillus, if we find the people who are already infected with the tubercle bacillus, treat them to prevent them from getting active tuberculosis, this is a very effective way of preventing tuberculosis, and it's also a very effective way of preventing those few cases of multidrug-resistant tuberculosis that everybody is afraid of, because multidrug-resistant tuberculosis occurs when a case of TB is screwed up, they are not treated properly or they don't take their medicine properly. So, if we prevent that person from getting active TB in the first place, he won't get multidrug-resistant tuberculosis. So I think the recognition is that tuberculosis is clearly a preventable disease, and in order to prevent the disease, you've got to diagnose the people at risk using skin tests or interferon-gamma release assays and treat those people before they get active tuberculosis.

Dr. Russell:

Is there an opportunity here for primary care clinicians like myself to take a leadership role in the risk-

based TB screening?

Dr. Reichman:

Absolutely. I mean, we don't know, essentially, who those 12 million people who are already infected with a tubercle bacillus are. Most people who get tuberculosis in the United States—probably 90% of them are people who are already infected, so if we were to deal with the people who were already infected, we could really prevent tuberculosis in the bud. So the primary care physician sees a lot of these patients, and his or her intervention would be key. And one of the most important things now, I think, in tuberculosis control is to engage the primary physician so that TB isn't just a disease of public health specialists but is a disease of practicing primary care physicians.

Dr. Russell:

So, following up on that, primary care folks like myself, say we take this more proactive approach to screening. Which patients or patient populations should I be aware of having that higher risk for tuberculosis?

Dr. Reichman:

Well, of the 12 million people in the United States, and we should say the third of the world's population globally who are already infected with the tubercle bacillus, most of them are never going to get tuberculosis, so the ones that you are most concerned about should be the people who are more likely to get tuberculosis. Now, who are they? The immunosuppressed, so people who carry the HIV virus, people who are being treated by TNF-alpha and other biologics that immunosuppress the person, people who are on steroids. Immunosuppressive therapy unleashes the TB bug, takes away the defenses of the body that keep the TB bug from spreading and can cause active tuberculosis.

I would think the next important group that primary care physicians see are contacts to already active cases of tuberculosis, because we know that an active, untreated case of tuberculosis spreads to people in his family, people he spends a lot of time with in his workforce, and so those contacts are key people who should be looked for to see if they have latent tuberculosis infection. So, rather than look at everybody that comes into your office... Most of the people who come into a primary care physician's office aren't at risk, but the immunosuppressed, the HIV-infected, the contacts, children under 5 who come from, say, foreign-born populations because they're more like—foreign-born populations are more likely to carry the organism with them, that he has been infected in a population where there's a lot of tuberculosis. So we do targeted screening. We certainly don't do universal screening.

Oh, I guess and the final group would be healthcare workers. Healthcare workers, especially people who are exposed to patients—and not the tuberculosis ward but the immunosuppressed ward, the diabetic clinic, places where you don't know that someone who's coughing, and someone might say,

“Oh, he’s got an upper respiratory infection, we’ll watch him or we’ll give him an antibiotic.” That person might have tuberculosis, so the person who is the healthcare worker who is exposed to the undiagnosed case of tuberculosis is certainly at risk, and most healthcare facilities do periodic screening to protect those individuals.

Dr. Russell:

So, doctor, you pointed out the importance of proactively identifying and treating high-risk TB patients. Can you walk me through the testing methods that are available? And which ones do you prefer?

Dr. Reichman:

Well, there are really 2 types of testing methods for latent tuberculosis infection. Well, there’s a third, which is the chest x-ray, but the chest x-ray doesn’t diagnose people who are infected without disease. The chest x-ray only finds people who have manifest tuberculosis disease that is big enough to show up on the chest x-ray. The 2 types are the tuberculin skin test, the Mantoux test, which is a test from the 1880s. It’s probably the most widely used biologic test in the world, and it is a situation where you take a mixture of tuberculosis antigens and stick them in the skin, and 48 hours later you see if there’s a bump on the skin. Now, if you look in Dorland’s Medical Dictionary, the ancients used to feel the skull to see if someone had behavioral problems, and this is, I think, as scientific as that. In an era of high-tech, you’re feeling for a bump on the skin, and you would then treat someone for something because of that bump on the skin, plus the fact that this is such an impure group of antigens that it also gives you false positives. For instance, it will be positive if somebody had BCG vaccination. And remember, we said that foreign-born individuals are at high risk of TB, and a lot of those foreign-born individuals have had BCG vaccination, so they will already have a positive tuberculin test and they may not be at risk of tuberculosis.

So the other group are interferon-gamma release assays. And what’s important about interferon-gamma release assays is they are laboratory-based tests and they are taken out of the hands of the thousands of physicians, including primary care physicians, and their nurses and their assistants, as well as the chest specialists and public health specialists, none of whom who have been trained to do a tuberculin test. So, tuberculin test, you think, “Oh, where’s the quality control?” There is no quality control. And those hundreds of thousands of tuberculin tests done all over the world, very few, if any, ever have any quality control. So then, if you have a test which is streamlined looking for interferon-gamma, TNF-alpha, things like that, and put it in the laboratory—and laboratories, as you know, are quality controlled to death—at least they’re going to do a credible job and you’re going to have reproducible results.

Dr. Russell:

So finally, doctor, before we wrap up—and you were very clear in our thoughts on this—are there any additional take-home messages you'd like to leave with our audience today?

Dr. Reichman:

Thank you for the opportunity. But I think one of the most important things in tuberculosis is index of suspicion, especially in the United States where we have little more than 9,000 cases a year. And suppose you have 600,000 doctors. Now, if you take away the psychiatrists, maybe you have 500,000 doctors. And then you take the... I don't know the number of primary care physicians, but probably a couple hundred thousand of those. So, if you do the division, each primary care physician is going to see maybe 1 or 2 cases of tuberculosis during his entire practice, so he's got to think tuberculosis. Now, I don't expect him or her to think tuberculosis in everybody, but if someone comes in who is a contact to an active case of tuberculosis, someone comes in who is immunosuppressed or starting on biologics, these are the people who are at risk of tuberculosis. And one of the things that we're not proud of is globally it takes a couple of months to make a diagnosis of tuberculosis. If someone comes in, I would flunk my grandkids if they didn't make the diagnosis from that x-ray. But if someone says, "Oh, he's a white, middle-class person, he can't have tuberculosis," wrong. So, he treats him for pneumonia or he treats him for bronchitis or treats for something else. Meanwhile, that patient is infecting other people, his close family members, his work people. So, I think the take-home message is "think tuberculosis." Now we have excellent diagnostics, IGRAs, that diagnose latent tuberculosis infection in high-risk people. And that's not the subject of this, but we treat, and we have excellent treatments to prevent latent tuberculosis from becoming active infectious tuberculosis.

Dr. Russell:

Well, Dr. Reichman, it was great having you on the program today to provide this critical update on TB screening strategies. Thanks again for joining us.

Dr. Reichman:

Thank you so much, Dr. Russell.

Announcer:

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