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Polio Detected in the U.S.: What Do We Need to Know?

Mr. Nacinovich:
Amidst an ongoing wave of COVID-19 and mounting monkeypox anxieties, recent cases of polio have begun to emerge around the globe. And just recently, a paralytic case of polio was reported in New York. What do these outbreaks mean for our patients? And how can we better protect them?

Welcome to the *Clinician's Roundtable* on ReachMD. I'm your host, Mario Nacinovich. And here with us to share insights on the recent polio outbreak is Dr. Charles Gerba, who's a microbiologist and Professor of Environmental Science at the University of Arizona.

Dr. Gerba, welcome back to the program.

Dr. Gerba:
Nice to talk to you.

Mr. Nacinovich:
To start us off, Dr. Gerba, can you tell us about some of the recent cases of polio that have emerged in the U.S. and around the globe?

Dr. Gerba:
Yeah. There's still concern about polio virus, particularly the recent case that was documented in New York, because polio virus spreads very readily. Now, the case that we're seeing was a vaccine-derived strain which was a live vaccine, and with the live vaccine, it replicates in you and can spread to other people for that reason, but every once in a while, one in six million doses, somebody actually develops paralytic polio virus, because you know like we saw with the SARS-COVID-2, these viruses always evolve, and when you're dealing with a live vaccine with polio, it can evolve to the virulent form. That's one of the reasons why in the United States we use the inactivated or the killed vaccine to prevent that, even though the risk is fairly low.

Mr. Nacinovich:
Now we know the last case of naturally occurring wild polio in the U.S. was 1979. We've now just experienced the case that have either been contracted outside of the U.S., or have been from the live polio vaccine, as you said, which is no longer given, in the U.S. The last case of vaccine-derived polio in the U.S., was reported just recently. And what do we know about the epidemiology of this virus? And what are the signs and symptoms that we all should be aware of?

Dr. Gerba:
This is primarily a virus of youth, actually. Most of the cases originally were children under six years of age, that actually acquired it, and it spreads very readily. And then after a few days, it could develop into the paralytic form, but that's fairly rare. Maybe only 1 per 2,000 cases would you see a paralytic illness actually develop. So most of it is actually fairly asymptomatic, so we don't see many clinical cases necessarily even when it's circulating in the community. But then again it can develop into the more virulent form, affect your neurons. You can get paralysis. You can die from it if it infects your breathing ability and that; so, it is always a concern for that reason, and its ability to spread very rapidly among a community. Particularly, the vaccine strain can spread just as readily in many cases as the wild-type polio virus.

Mr. Nacinovich:
Now, this topic is exceptionally personal to you as well beyond the science and the microbiology of it. Can you tell us a little bit about your personal experience with this?

Dr. Gerba:

Actually, I acquired polio virus about a year before the vaccine came out, and I remember waking up in the morning. I had a fever a few days before, and I was paralyzed on my right side for a few days. That largely went away, but I was left with somewhat paralyzed right hand and fingers the rest of my life from that. So I did experience that episode in my life. I'll never forget it because I was quarantined at home at the time as a young child.

Certainly, terrified my family, and I was made to stay home for that, but fortunately, the Poliomyelitis Foundation provided free healthcare at the time for me.

Mr. Nacinovich:
Now let's take a look at the recent case in New York. On July 21, 2022, a paralytic case of polio was reported in New York, and officials also reported finding evidence of polio virus recently in the city's wastewater samples. Dr. Gerba, where did this strain of polio come from?

Dr. Gerba:
It was believed to have come from an oral vaccine given by an individual from Europe who came to the United States. Now, that has happened occasionally, but the concern here is it spread among a religious community that may not be fully vaccinated. Their vaccine rates may be as low as 50 percent, 60 percent, where most of the U.S. the vaccine rates are more 90 to 93 percent, and the concern here is that the oral vaccine polio virus may spread among this community and mutate.

Mr. Nacinovich:
Talk a little bit about the role of wastewater samples. I know this is an area of great concern and certainly recent emergence of us looking for viruses and other bacteria in the wastewater.

Dr. Gerba:
So, you know, actually, polio virus monitoring in the wastewater has been around for 50 years, and it's really been used by the World Health Organization and other groups to monitor communities in the developing world to determine if they needed a vaccine or vaccine should be used in that area to control the polio virus and hopefully eradicate the polio virus, but suddenly, it's begotten more attention because of the wastewater epidemiology that's been done with SARS-COVID-2, and suddenly, in applying that technology now. I think what we've realized with the wastewater epidemiology that's been going on since SARS-COVID-2 that the polio virus has actually been circulating in the New York area, for some time now, and some of my colleagues suggest that polio virus may be circulating all the time at a low level in the U.S. We just haven't been monitoring the wastewater. So we may find out that there always is a small risk maybe from polio virus among the general population, and that's why vaccination is so important to keep that level of number of people immunized to prevent the spread of virulent polio virus.

Mr. Nacinovich:
You are correct. On August 12th, health officials in New York actually reported finding evidence of polio virus in the New York City wastewater samples as well. And really, I think on the mind of many listeners maybe how this virus in the wastewater may affect the general population, any concern there?

Dr. Gerba:
Yes, I think it is, to make sure that all the vaccinations for your children are up-to-date because this is primarily an illness of children we're talking about here. And I think there's a concern that people have gotten lax, and because of the SARS-COVID-2 pandemic, they haven't kept up on their vaccines, and it's really important to do that because this is primarily a childhood disease, so it's really up to the parents to ensure that their children get fully vaccinated and follow the vaccination program that's used for polio virus.

Mr. Nacinovich:
For those just tuning in, you're listening to *Clinician's Roundtable* on ReachMD. I'm Mario Nacinovich, and I'm speaking with Dr. Charles Gerba about recent cases of polio virus seen in the United States and also around the globe.

Dr. Gerba, if we can take a more global view of these outbreaks, can you tell us a little bit about the cases being reported in other parts of the world?

Dr. Gerba:
We will try to eradicate polio virus like we did with smallpox, but that's been much more challenging because this virus spreads so readily through the environment. But we still have virulent cases of polio virus in Asia, like Pakistan and Afghanistan. Largely because of conflicts in that region it's hard to get the communities to vaccinate. But every once in a while cases from there get into the African continent, and so there's concerns with movement out of that region, and that's why vaccination becomes so important. But, virulent polio virus is still out there in the world. The hope is eventually to eradicate it, but it's been very difficult because of conflicts in certain regions of the world.

Mr. Nacinovich:
We definitely know that polio is not respective of any borders, and anyone who's not fully vaccinated is certainly at risk. And we know that on May 15 of this past year, a case of wild polio virus 1 was actually reported on the African continent in Mozambique, through the Global Polio Laboratory Network, or GPLN, so it's definitely important for us to continue this surveillance. But based on these cases that we've observed, what do you think are some of the primary factors that are driving these outbreaks?

Dr. Gerba:
I think one of the reasons is travel. We can travel almost anywhere in the world in 24 hours making it difficult sometimes to control these illnesses. And like we saw with the case in New York, somebody acquired it initially from a vaccine strain given overseas and then came to the U.S., so I think that's one of the challenges I've seen in infection control is a rapid way viruses and other pathogens can spread around the world so quickly. I think it's going to be a real challenge for us, both from infection control and in vaccination to make sure everybody is vaccinated to control the rapid spread of infectious diseases worldwide today.

Mr. Nacinovich:
And Dr. Gerba, are there any steps we can take to help protect our patients against the polio virus?

Dr. Gerba:
Right away we recommend a vaccine. You know, it should begin in childhood, early in childhood, actually, and ensure that certainly, any small children are vaccinated. If they haven't been vaccinated, you should start the regime right away. You know, look out for the signs too of polio virus, particularly if they're from certain communities or the children haven't been vaccinated. Are they suffering fever, rash and fatigue? That's always concern that that could be easily overlooked.

Mr. Nacinovich:
Should we worry about a polio outbreak at this time in the U.S.?

Dr. Gerba:
It's very unlikely of a polio virus outbreak because of the large amount of vaccination that's taken place. 90-93 percent of the population is vaccinated. so my concern is with certain communities where the vaccination level may be very low because they're at much increased risk of potential of a virulent polio virus outbreak, but I think it spreading across the United States is very unlikely.

Mr. Nacinovich:
So, while we are extremely effective historically at preventing polio, what do you see as the immediate next steps? Are we prepared now for the type of mass immunization that's happened historically and some type of outbreak control campaign or awareness campaign here in the U.S.?

Dr. Gerba:
I think we can gear up very rapidly. The vaccine strains are available for the polio virus, so I think if there was a need, we could respond very well to that. We've done it before with polio virus, and we could do it again. I'm not really too worried about that. The vaccines are available and used worldwide, so I don't think that would be a major issue if we really did have to worry about a polio virus outbreak of any size. Even a small size could be easily contained.

Mr. Nacinovich:
Well, with those insights and recommendations in mind, I want to thank my guest, Dr. Charles Gerba, for sharing his insights on emergent cases of polio in the United States and around the globe. Vaccination definitely is key.

Dr. Gerba, it is a pleasure speaking with you once again.

Dr. Gerba:
Nice to talk to you.

Mr. Nacinovich:
I'm Mario Nacinovich. To access this and other episodes this our series, please visit ReachMD.com/CliniciansRoundtable where you can be Part of the Knowledge. Thanks for listening.