Infectious Questions EP 28: Update: Children and COVID-19 (2019-nCoV, Pt 13)

Shivoan: Welcome to Infectious Questions, a public health podcast produced by the National Collaborating Centre for Infectious Diseases. I'm Shivoan Balakumar. We're continuing our series on COVID-19 covering topics and questions of interest among public health practitioners in Canada. For our thirteenth episode, we'll be providing you with an update on the evidence regarding COVID-19 among children and adolescents in Canada, a topic that we first covered in episode 11. We spoke once again with Dr. Joanne Langley, a pediatric infectious diseases clinician in Halifax, at the IWK Health Centre at Dalhousie University. Here's NCCID's Margaret Haworth-Brockman with Dr. Joanne Langley.

Margaret: Thank you for joining us again, Joanne. A lot has happened in just over a month since you and I last spoke and certainly a lot more information about COVID-19 in children. I wonder if you could start by telling us what the current epi information is available about COVID-19 in children in Canada?

Joanne: Thank you, Margaret, for having me here today. Yes, things have evolved. It looks like we're flattening our curve nationally and on the downside for now. So, as the over 90,000 COVID-19 cases collected through surveillance as of June 2nd, about 6.53% are in persons under 19, which we would say is children, the age group. A small percentage. That's remained consistent. Now, of course, one has to remember that the cases that are diagnosed through this system are ones that are ill, so the spectrum of illness that is predominantly requiring medical attention and that's how they come to get their laboratory confirmation earlier in the outbreak. We didn't have the resources to test everyone, so it was particularly hard when it was part of a contact tracing or if someone was coming in for diagnosis to the hospital, that one would get this laboratory confirmation.

All that to say, we're probably under-recognizing the number of children that have had an infection. It suggests that, if they're infected, it's a milder infection, or perhaps they're, for some reason, protected against this coronavirus because of heterogonous protection from previous coronavirus infections. But that's something we don't know. Those are speculative ideas.

Margaret: It seems that there's new information since April about how children present their symptoms with COVID and this coronavirus. Can you talk a little bit more about what is new in that information?

Joanne: That's correct. If one looks at those statistics that I just cited and when we talked in April, it seems like only 5% or so of children are affected. We started to hear reports, first from Europe, then from New York State and throughout the US and now in Canada, of what is now being called a multisystem inflammatory syndrome in children associated with coronavirus disease. So, after one is affected by a pathogen, you can recover from that infection, and that will be a return to normal health. Several infectious agents cause post-infectious syndromes. For example, a group-based step, we know that's associated with rheumatic fever. Well, rheumatic fever is not an infection; it's the body's response to the antigen that they were exposed to. The body makes an immune response, and that tends to cause illness.

We think that it's probably something related that's causing this multi inflammatory syndrome in children. The diagnosis is made about a month after they would have been exposed, so it's temporarily a little later when an outbreak occurs in your jurisdiction. The children usually present with fever, prolonged fever, and it looks many times like Kawasaki disease. Kawasaki disease is also a systemic inflammatory syndrome of vasculitis. It can present with red eyes, bilateral conjunctivitis, adenopathy, skin changes, red lips, strawberry tongue and inflammation of anybody's system. So, this syndrome is generally diagnosed if the person is under 21 years of age, they're presenting with fever, there's laboratory evidence of inflammation, there are things like CRP or ferritin and evidence of clinically severe illness requiring hospitalization. This could be pulmonary. It could also be renal disease, cardiac disease, hematologic, gastrointestinal skin.

The COVID toes can be a part of this syndrome that we have heard of. There isn't any other plausible diagnosis, and there's some reason to think that they would have been exposed to COVID. Whether they have a positive PCR or evidence of an antibody response or an epidemiologic history of contact with someone with COVID. So, this syndrome is a severe one, and we must recognize that these children need treatment. They're generally treated similarly to the way we treat Kawasaki disease, which is intravenous immunoglobulin. They may also need steroids and biologic modifiers. If they have a more diverse spectrum or are sicker, for example, some of the children would present with shock, their blood pressure could be low, and it could seem like they're dehydrated.

They generally are cared for by – in addition to infectious disease – a rheumatologist, cardiologist and other specialists. Also, potentially an immunologist, as we come to understand what's the best way to take care of these children and what therapies will alter the natural history—lots of epidemiological information to suggest that it is associated with COVID.

Margaret: Thank you. Some alarming symptoms and severity for clinicians and public health to be kept aware of. Are there any particular populations among

children, maybe by sex or geographical location that we should also keep in mind for Canada.

Joanne: It does affect both males and females. There are some unusual features. Kawasaki syndrome is usually in younger children, whereas this multisystem inflammatory syndrome tends to be in children over seven, or so. That's unusual. Some studies have shown that children of African origin or Caribbean origin are overrepresented in the sample of patients that present with this illness. We're worried about immunocompromised children because they already have immune dysregulation of some kind, and we would want to avoid additional challenges to their health. So, those are some of the things we know so far.

Margaret: Thank you. So, now in Canada, the provinces are going into various stages and phases of easing restrictions on our movements and our opportunities to be in social groups, including some children going back to school even this month. Can you tell us a little bit about what's happening behind the scenes in public health to help offset any further transmission among children?

Joanne: That is indeed an important question. We've talked about children as vectors of disease, their role in the overall community and isolating them or preventing them from exposing other people is one consideration. Then, the other consideration is when infection could affect them as an uninfected host and then they could become ill. As we've discussed so far, overall, the degree of illness and the percentage of children that require care is much smaller than adults and adults in various risk groups. But there still is illness that occurs in children, and this new multisystem inflammatory syndrome is one of the more concerning disease manifestations that we're seeing and that we need to learn more about.

Most of the evidence on schools as settings for transmission of infections, and similarly daycares, are using school closures as a model, from influenza outbreaks. You're trying to reduce the social contacts between students and interrupt transmission. But, as we mentioned, we don't truly understand the role of children and the transmission of COVID-19. My colleagues in the Public Health Agency of Canada and, of course, the Immunity Taskforce are tackling that question among others to determine where the transmissibility is happening, who becomes immune and is no longer transmitting disease and so on. So, that's one part of it - figuring out the epidemiology. That's going on in the background and the foreground. The other thing I'd say about schools and out-of-home childcare is these various congregate settings where children gather require that we think about how to prepare for the fall and the summer.

And we know that there can be transmission in the school of other infectious diseases. It's often related to social events linked to a school, rather than so much occurring in the classroom itself. You have to balance the benefits of reopening school, which are that education will occur perhaps more in the school setting. Also, for some children, particularly the older ones, the longer children stay out of school, there's a risk of them not returning. Another factor is socioeconomic and that children in school allow parents to go to work, and we want parents to be able to work for economic income, the stability of our country and their wellbeing. Also, some children get their healthcare in schools in cases where there are school nurses. There may also be child welfare support and nutrition programs for their breakfast or their lunch.

So, some of the things that are going on behind the scenes of how and when to reopen school is considering the amount of disease that's in the community. Can public health respond to cases as they occur in the school setting? What kind of collaboration coordination needs to happen between schools and public health? Are there particular children who shouldn't go back to school or staff who shouldn't be there? For example, staff that have immunocompromised conditions, respiratory or heart disease, perhaps they shouldn't be at risk. Because a school setting or a childcare setting is not the same as a healthcare setting where you can have more distance care for people and use all that personal protective equipment. So, are you going to use all that personal protective equipment in a childcare setting? Probably not. Are you going to be able to do the same level of hygiene, will you have the right ratio of care providers to children?

These are some of the considerations. Folks are thinking about things like children bringing their own lunch so that there's no food handling. We think about spacing out attendance so it occurs in shifts thoughout the day to reduce the density of children. These are some of the many considerations that we will need to think about, in addition to the physical site of the school, how it's set up to handle densities of children, educators and their helpers in a way that's safe for everyone.

Margaret: Is there anything else, Joanne, that you'd want to share with us regarding what you're seeing in children right now with the pandemic?

Joanne: I would say that it's important for us to be aware of these new syndromes, to encourage healthcare providers to be on the alert for these syndromes so that we can report them. Currently, there's a surveillance program that will go live on the Canadian pediatric surveillance program. We need to know the full spectrum of this illness so we can better recognize it and direct children to appropriate care to prevent the long term consequences. For children, that's Kawasaki disease or Kawasaki-like syndrome, which can be coronary artery disease and renal failure. These

are important things we wanted to prevent, and we want to know the best way to treat and prevent them, if possible. So, just a call out to encourage people to be on the lookout for them, to report them and to make this an accelerated time of learning so that we, as much as possible, prevent more morbidity and death.

Margaret: Thanks very much for your time, Joanne. It was very informative, and we appreciate you taking the time to tell us about these newer developments.

Shivoan: That was Margaret Haworth-Brockman once again speaking with Dr. Joanne Langley. If you have other public health questions on COVID-19, please submit them to nccid@umanitoba.ca. Production of this podcast has been made possible through a financial contribution from the Public Health Agency of Canada, but the views expressed here do not necessarily represent those of the agency. The host organization at the NCCID is the University of Manitoba. Learn more at nccid.ca.