

### Transcript Details

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www.reachmd.com  
info@reachmd.com  
(866) 423-7849

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### Priorities in Pediatrics: Vaccinations & the COVID-19 Disease Course

Dr. Caudle:

Coming to you from the ReachMD studios, this is *COVID-19: On the Frontlines*. I'm Dr. Jennifer Caudle, your host, and joining me to discuss the effects of influenza and pneumococcal vaccines on the COVID-19 disease course in the pediatric population is Dr. Anjali Patwardhan, a pediatric rheumatologist at the University of Missouri Healthcare. Dr. Patwardhan, thank you so much for being here today.

Dr. Patwardhan:

My pleasure and thanks for having me.

Dr. Caudle:

Well, we're excited that you're here. So what led you to explore COVID-19 infections in pediatric patients who had already been vaccinated for influenza and pneumococcal?

Dr. Patwardhan:

So, this is interesting. The viral interference was actually a known phenomenon first discovered in the sixties when people started thinking that this previous virus infection may be having an effect on the ongoing future infection. And it was actually studied to some extent, and then when influenza epidemic in 2009 and it was seen that actually, the influenza A and B incidences got reduced that year of pandemic and then it was studied and found out that it was due to a viral interference. We got so busy in this pandemic that nobody got a chance to look at whether there is any correlation between the flu vaccine and the coronavirus. And in the clinical area, when I saw that patients mostly going into the ICU or having bad outcomes, or even being symptomatic but actually those who were not vaccinated with the flu vaccine in the current year, and that prompted me to look at the statistics and the numbers that viral interference was actually happening.

Dr. Caudle:

And can you help set the stage for us by explaining your study's design and method?

Dr. Patwardhan:

Sure. What helped me do this study was the policy of the hospital because the policy was that they did disaster screening. That means every patient who needed inpatient admission got a COVID test, and everybody who had symptoms got the COVID test, and people who had history of exposure got the COVID test. So, we got loads of COVID tests done during the COVID period. And this period actually extends; we started doing COVID tests very early on and that was in early March and so much til the 31<sup>st</sup> of August, so that includes the period when there were actually socially distancing and then there were no social distancing. So it gives us journey of the pandemic over nine to seven months period and that I think is the strength of this study. And also, we only included those patients who were tested genetically, who were tested for COVID PCR and that's why they did not include suspected COVID cases or cases which only had symptoms and contacts but did not test positive. So it was the PCR positive COVID that was included in this study.

And so we did an introspective chart review on all the patients who were seen in the health system and over this seven-month period of time and we looked at their specific age groups, we looked at different parameters, including age groups, comorbidity, weight and type of disease in different age groups. The youngest patient who tested positive was 3 weeks old, and we tested up to 20 years of age. So we had a very big pediatric population and early events who genetically tested positive by COVID PCR. And this was an introspective chart review where after the IRB approval were obtained and we used a statistical metrics to find the significance of different parameters. And

one of the parameters was that if these patients were actually vaccinated with the flu vaccine in the current flu season; we did not include the patients who were vaccinated in the previous years with flu vaccine.

Dr. Caudle:

And with that being said, Dr. Patwardhan, what results did you observe in these pediatric patients?

Dr. Patwardhan:

So, we actually saw that the children who were vaccinated with the flu shot in the current year actually had a better outcome. They were less likely to be symptomatic and less likely to have morbid to severe disease. We classified disease on a specific standardized criteria to define them as mild, moderate, or severe disease and we collected data based on these criteria only. And we did a COVID adjustment for weight, sex, age, month of diagnosis, and comorbidities, and we found that actually, flu vaccination was single independent factor that actually was correlated with a better outcome.

Dr. Caudle:

For those of you who are just tuning in, you're listening to *COVID-19: On the Frontlines* on ReachMD. I'm your host Dr. Jennifer Caudle, and I'm speaking with Dr. Anjali Patwardhan about COVID-19 symptoms in pediatric patients who had received the influenza and pneumococcal vaccines.

Now Dr. Patwardhan, let's dive a bit deeper into the results of your study here. Can you explain what viral interference is and if this is why having the influenza vaccine may have led to lower odds of experiencing COVID-19 symptoms?

Dr. Patwardhan:

Sure. So, the virus interference phenomenon, which suggests that it's a single host, it's actually infected or exposed to a viral antigen, and host is, again, exposed to a second viral antigen; the first viral antigen prevents the infection by the second viral antigen through a phenomenon called viral interference. And this is mediated by a substance produced by activated T-cells and that is called interferon. The interferon also goes on and produces another substance, which is called anti-viral protein, that's what is the name given in the most publications and so far, by the scientists. And this substance also prevents the infection of the other known infected cells with the new virus. So, the initial virus that stimulated the phenomenon of viral interference does not necessarily have to be a light virus, it can even be a killer virus, like the flu vaccine. And flu vaccine is the only vaccine that we receive every year. So, it's an annual vaccine, so it definitely can have effect on any ongoing virus pandemic or any ongoing other viral infections in the community.

Dr. Caudle:

OK. And did you experience any challenges in accounting for asymptomatic patients throughout the study?

Dr. Patwardhan:

Well, even too many patients have been the majority of patients in pediatric population, but I didn't have challenge because of the policy of the hospital. Because they were testing so liberally and they had a criteria which was very broad who they would test, and they were using very good testing methods. So every patient we picked up, we did not have false positives a lot and we picked up every patient who may or may not be symptomatic, so we got a bigger crowd of asymptomatic patients picked up in time.

And we know that COVID infection is one part and one aspect of this viral infection. We now know that the MIS-C, which is a multi-system inflammatory syndrome in children is another aspect of COVID infection in children. And that is not because of viral infection; it's actually caused by the immune response of the body to the virus exposure. And that aspect of this viral disease has not been correlated with the use of previous flu vaccination.

Dr. Caudle:

And lastly, Dr. Patwardhan, what do you hope to observe at the end of the 2020-2021 flu season? Are there certain data points between the flu vaccine and COVID-19 vaccine that you're looking forward to observing?

Dr. Patwardhan:

Yes. And one more important thing I wanted to bring to your attention is that this year, the incidence of flu has been low and that has been attributed to the social distancing to less traveling, to mask-wearing and all those things. I do agree that they all have contributed to the lower incidence of flu this year, but I was curious that the SARS-CoV-2 is doing the reverse viral interference and we do see the incidence of flu infections also in the community.

So, that was one point I wanted to say. And the other point that I wanted to say is that I went and looked at the HHS website and I saw that the incidence of flu vaccination is far lower in the communities, like black communities or Hispanic communities as compared to the mainstream communities. And I was curious if the higher incidence and the severity disease in black communities and in Hispanic communities are also because the viral interference. Because they have a lower rate of flu vaccination.

Dr. Caudle:

Well, this has been a very interesting and timely discussion amid growing concerns of a twindemic, and I'd like to thank my guest, Dr. Anjali Patwardhan, for joining me to discuss her research on the effects of influenza and pneumococcal vaccines on the COVID-19 disease course. Dr. Patwardhan, it was great having you on the program.

Dr. Patwardhan:

It was a pleasure talking to you today.

Dr. Caudle:

I'm your host, Dr. Jennifer Caudle, and to access this program and other episodes in our series and to add your perspectives towards the fight against this global pandemic, please visit [ReachMD.com/COVID-19](https://ReachMD.com/COVID-19), where you can Be Part of the Knowledge. Thanks for listening.