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An Epidemic Amid a Pandemic: CVD, COVID-19, & the Leading Cause of Death Worldwide

Dr. Sorrentino:
Cardiovascular disease has been and continues to be the leading cause of death worldwide, but in the midst of the COVID-19 pandemic, could that ranking continue for years to come, or is it even possible that COVID will knock cardiovascular disease out of the top position?

You're listening to Heart Matters on ReachMD. I'm Dr. Matthew Sorrentino. And joining me today is Dr. Salim Virani, who's a professor of medicine at Baylor College of Medicine in Houston, Texas, and the Cardiovascular Disease Fellowship director at Baylor. He's also the co-director of the V.A. Advanced Fellowship Program in Health Services Research and Development at the Michael DeBakey Veterans Affairs Medical Center in Houston, Texas. Dr. Virani, welcome to our program today.

Dr. Virani:
Thank you, and glad to be on the program.

Dr. Sorrentino:
So as you know the COVID-19 pandemic has certainly wreaked havoc on mankind in general and has been a major disruptor of our healthcare system. In cardiology specifically, we've seen a shift away from our usual cardiac admissions to more COVID patients with COVID cardiovascular complications. I wonder if you can give us an overview of the relationship you're seeing between cardiovascular disease and the COVID-19 pandemic?

Dr. Virani:
Sure. So I think you already mentioned it, that initially when the COVID-19 pandemic hit us, we were all worried about the acute cardiovascular effects of COVID-19, which we know affects the heart. It affects the endothelium. We know it is associated with an increased risk of MI. And now they're finding out that it's associated with an increased risk of thrombosis as well. And then, of course, whenever the lungs are affected it does affect the heart because overall, your oxygen supply to any part of the body, especially for an organ as metabolically active as the heart, it takes a toll. So right from the beginning, we knew that this was going to be an issue for the heart as well. And we know from prior history, from other viruses as well, even when we look at flu virus, that whenever there is infection with flu, there is increased risk of cardiovascular disorders following that. We also saw some arrhythmias early on when we look at the experience from Wuhan, China, and that was seen in the U.S., as well. So that was our initial concern. We also saw myocardial age-related patterns with troponin elevations. All of that was there and that's what we saw early on. But of course, then there were other patterns that emerged. And I believe we can talk about those in terms of deferral of care and then this whole side of things whereby how is long-term cardiovascular health affected by COVID-19? And that is really where we are in terms of this pandemic and cardiovascular health right now.

Dr. Sorrentino:
I certainly want to discuss some of the long-term effects in a little bit more detail. But before we do that one question that's really been something I've wondered about is how this has changed cardiovascular disease in our hospitals. We've seen a significant decrease in the number of patients coming in with heart attacks and procedures. Is COVID overtaking and is it becoming the number one killer? Is heart disease decreasing? Or somehow are cardiology physicians missing some of the standard diagnoses we had before?

Dr. Virani:
Yeah. So, again a very important question. And I'm going to have a little bit of a longer reply to this since it is so important. So the first thing you asked was that is COVID-19 going to become, the cause of death in terms of the one causing more deaths in the country. The

answer is, if you look at the 2020 data, of course, everything is still being compiled. But we had approximately 360,000 deaths from COVID-19. On the other hand, we had more than 800,000 that's related to cardiovascular disease. So overall, cardiovascular disease remains the biggest killer in our country. And I believe that trend will continue. I think COVID-19 will fall somewhere between the third and the fifth most common cause of death in our country. We wanted everybody to stay home, but I think the messaging was perhaps not as clear to some of those patients that calling 911, when somebody is having an acute heart attack or stroke, those rules of engagement with the healthcare system remain the same. We believe that the number of deaths from cardiovascular diseases actually may have gone up. Of course, COVID itself leads to cardiovascular complications that we discussed just now, and that in itself can lead to more cardiovascular deaths, even in 2020. But of course, the long-term effects are what everybody's worried about.

Dr. Sorrentino:
You briefly mentioned the effects that COVID has on the heart and what we're seeing. I guess the question I have is, is this a direct toxicity of the virus on the endothelium, on the myocardium? Or are some of the cardiac complications we're seeing due to our overreaction of our immune system and cytokines and having an effect on the heart? I guess, how much do we know? Is that viral related and or other system related?

Dr. Virani:
I think that's a great question. I don't think that we know enough. What we do know is exactly what you said, that it can lead to this pattern of myocarditis. It can affect endothelial cells leading to endothelium dysfunction and making our patients more thrombogenic in the acute phase when they have COVID-19. But as you mentioned, the cytokine and cytokine storm that we all worry about day seven or so, and that cytokine storm itself leads to a lot of damage to the heart as well as other organs as well, whether it's the kidney, whether it's the lungs. And that itself takes a huge toll. Now, what's the relative contribution of each of these? We don't know exactly, but we do know that this cytokine storm is what gets a lot of our patients into a lot of complications when it comes to cardiovascular disease. And then, as you are probably aware, and most of our listeners are, that this association now that COVID-19 has with thrombotic risk. We are seeing quite a bit of DVT and pulmonary embolism as well. And then, of course, I personally have seen a few cases of arterial thrombosis as well. There's a lot of stuff here that we don't know. And I believe as time goes by, we'll learn more and more. And I think importantly what do we do to actually mitigate this risk? I think that's, of course, the most important question.

Dr. Sorrentino:
For those just tuning in. This is Heart Matters on ReachMD. I'm Dr. Matt Sorrentino, and today I'm speaking with Dr. Salim Virani from Baylor College of Medicine to discuss how cardiovascular disease is being impacted by the COVID pandemic. Salim, we've talked about some of the acute effects that COVID has on the heart but there's a huge interest now in the longer-term effects, the so-called long haulers, and many cardiology physicians are seeing many patients who have complications and disabilities from COVID that are lasting for many months after their initial infection. What are some of the cardiovascular implications, long-term of COVID that you're seeing?

Dr. Virani:
So again, we are still just a year out from the first few cases that were reported in U.S., so it remains to be seen. We have seen patients who have developed cardiomyopathy and it remains to be seen how much of that function can be recovered long term. So, I think those are some of the patterns we are seeing as far as I would say, rather short to intermediate-term effects from COVID-19. But, of course, this is an area that's open for research in terms of what are the long-term complications of COVID-19. And there are a lot of efforts in terms of large registries that have enrolled quite a few patients to see if there is any long-term impact from COVID-19 on the cardiovascular system.

Dr. Sorrentino:
We've also been seeing a lot of patients with the autonomic dysfunction that you just mentioned, sort of like a POTS syndrome, which can be very disabling. Is there any approaches that you and your team have taken to try to treat some of these patients at this point in time?

Dr. Virani:
There is no clear guidance right now as far as how do you treat these, so we have just been working with, our electrophysiologists very closely to see what are some of the treatment approaches that we can take in these patients. Of course, the usual measures, I think we're hoping that this is a temporary phenomena, and this autonomic dysfunction hopefully will improve with time. So making sure that during that time patients can take care of themselves and don't have false or very disabling symptoms. So just maintaining their hydration, sometimes a touch of beta-blocker. But as I said, a lot of this is shooting in the dark right now. We just don't have enough data to say what is the right approach here. But it's more of a collaborative approach. And these are the times when you really reach out to all your colleagues and ask them as to what they think are the best approaches. And that's, again, at a personal level, that's been one of the very positive things that have come out of COVID-19, whereby just because this is something that we had not seen before, there's

a lot of collaboration between clinicians in the same hospital, in the same region, and sometimes even reaching out to colleagues from outside your institution just to see what you need to do to address this and what's the best possible way based on what we know.

Dr. Sorrentino:
It seems to me that long-term vaccination is going to be an important component in really shutting down this pandemic. In a paper that you were involved in that was published in JAMA in September of 2020, you noted that a large proportion of U.S. adults with cardiovascular disease didn't get an influenza vaccine and there were certain socioeconomic subgroups that were even greater risk of not getting the vaccine and of course, then getting complications. What do you see as the implications for the COVID vaccine? Do you think there is going to be a mismatch between patients getting the vaccine? Is that going to keep this pandemic going for years to come?

Dr. Virani:
Well, I certainly hope that that does not happen. We certainly hope that when vaccines, of course, now have been rolled out, that we don't run into the same issues that we did with the influenza vaccine, whether it's overall for the country, whether it's patients with atherosclerotic cardiovascular disease or its patients with other chronic medical conditions. Now, I think one way to look at this is that, rather than having patients come and get their vaccines in hospitals or clinics, I think we have to go to where the patient's built environment is. Taking it to the community, I think is going to be extremely important and making sure that the community leaders are fully engaged. So, the ethnic minorities have full trust in this vaccine that it is going to help us. It is going to help us get out of this pandemic. So I think working on both the accessibility and making sure that we're working with patients and the community to ensure that patients buy into this as well. And I think that's going to be the key for us to get to that level of herd immunity that everybody has been talking about.

Dr. Sorrentino:
And do you have any final words of wisdom for our patients? Many of them are still frightened to come to the clinics and come to the hospitals while this pandemic is still raging. What can they do to protect their heart health during this time of the pandemic?

Dr. Virani:
Emergencies should be dealt with the same way as they were pre-COVID. So if you're having chest pain and you would have called 911, you know, pre-COVID, the same thing should happen. If you're having difficulty moving your arm or leg, difficulty speaking, if you would have called 911, you should do the same thing now. Do not defer acute care when you need to get acute care. You should be very comfortable in knowing that if you come to the hospital, all the hospitals have protocols in place that will really reduce your risk of getting COVID while at the hospital. I mean, just look at the last year, how many instances we've had where there has been transmission of infection or in this case, COVID-19 in hospitals, actually very, very low. So there should be a lot of comfort for patients in knowing that all the hospitals are taking those precautions. I think we know enough now with proper physical distancing processes, we have the proper use of face mask, and now if you were vaccinated as well, I think there is a lot of incentive for our patients to get back to their normal routine. That is the number one message I'll have for them after, of course, getting the care that they deserve. The second is to make sure that they're getting back to their usual physical activity. The third is diet. We know in every pandemic, diet is always affected. So, we need to make sure that we're taking care of our diet. Then I think mental health, which is extremely important because we know mental health also is associated with cardiovascular health.

Dr. Sorrentino:
Sure, sure. Well, thanks. Those are great messages. Now we just need to get them out to our patients as well. And with that, I want to thank Dr. Salim Virani for providing these insights into COVID-19, the pandemic, and how it's affecting our cardiovascular field. Salim, it was great talking to you today, thanks for joining us.

Dr. Virani:
And thank you for the opportunity.

Dr. Sorrentino:
For ReachMD, I'm Dr. Matt Sorrentino. To access this episode and others from Heart Matters, visit ReachMD.com/heartmatters, where you can be part of the knowledge. And thanks for listening.