The Latest on Vaccines, Cancer and COVID-19 with City of Hope

National Webinar Transcript

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Presented by:

This program is in partnership with

Jenna Fields:

Hello everybody and welcome to our webinar this morning. We are excited to have you join us for Vaccines, Cancer and COVID-19 with Dr. Sanjeet Dadwal. Chief of Infectious Diseases at City of Hope. I'm Jenna Fields. I'm the California Regional Director for Sharsheret and I'm just so glad you're all joining us. I'm really looking forward to this presentation today in light of everything that's going on in our country. For those of you who are new to Sharsheret, we are a national nonprofit organization. We provide free support for women and families facing breast and ovarian cancer as well as support for those with elevated genetic risk through free confidential and personalized support and resources. We also provide community health education programming throughout the country including our webinar series. Since the start of COVID we've been doing a webinar about every week and we hope that you'll join us next week for our next webinar which is on symptom management for anxiety and depression during and after cancer.

Jenna Fields:

Followed by the following week we're doing something a little bit more light which is a Shavuot Family Bakefest. Then two weeks from now we're doing a zentangle therapy doodling program. Lots of great programs coming up. My colleague is putting information in the chat box. You can actually sign up right now. A few housekeeping items before we begin. Today's webinar is being recorded and it will be posted on our website along with the transcript. Don't worry if you miss anything from today or if you want to send along to friends and family, you will be able to do so and your names and faces will not be in the recording. We're now offering closed captioning for our webinars. Today's the first time we're doing it. For anyone who would like closed captioning, simply click on the closed captioning button on the bottom of your tool bar.

Jenna Fields:

It is right next to "reactions." Click on that and you'll be able to read along if you need to. If you'd like to remain private you can turn off your video and rename yourself or you can call into this webinar and instructions for how to do that are in the chat box. Finally, Dr. Dadwal is going to start his presentation with a PowerPoint then we'll have time for a Q&A which I'll be moderating. Please put your questions into the chat box at any time. We'll be collecting those then getting to Q&A a little over halfway during the program. I want to thank our sponsors. Our wonderful sponsors are City of Hope, Merck and Seagen. Thanks to them we're able to do this program. Just a little Sharsheret plug for you. If you haven't already ordered our Thriving Again kit, whether you were diagnosed 10 weeks ago, 10 months ago or 10 years ago, we offer resources in this kit to help you navigate your entire survivorship journey.

Jenna Fields:

Each kit includes information on health and nutrition. It comes with an exercise stretch band, information on genetics, bone health. It's totally free and we customize it for you. We are putting the link in the chat box to that as well. Please take advantage of that free resource. We'd love to send you one. Our medical disclaimer, Sharsheret is a national nonprofit organization and does not provide any medical advice or perform any medical procedures. The information provided by Sharsheret is not a substitute for medical advice or treatment for specific medical conditions. You should not use this information to diagnose or treat a health problem. Always seek the advice or your physician or qualified health professional with any questions you have regarding a medical condition. Now it's my pleasure to introduce Dr. Sanjeet Dadwal. He is the Chief of City of Hope's Division of Infectious Diseases.

Jenna Fields:

Dr. Dadwal has been on the front lines of the COVID-19 pandemic. He specializes in treating cancer patients who develop infections of frequent complication of chemotherapy and transplants. His research

focuses on understanding the mechanics of such infections and finding new ways to control them. After receiving his medical degree in India, Dr. Dadwal continued his training at SUNY Downstate Medical Center in Brooklyn, New York and the Charles R. Drew Martin Luther King Hospital in Los Angeles. He is currently the principal investigator in a clinical trial researching an innovative new treatment for cancer patients with COVID-19. It is so our pleasure to have you here Dr. Dadwal. Please begin your presentation. It looks like you're muted Dr. Dadwal.

Dr. Sanjeet Dadwal:

I am, yes. Can you hear me now? Okay. Good morning. I just wanted to thank the organizers for inviting me to give a talk here. Thank you Jenna for the introduction. I'm going to share my screen here and we'll start the presentation. You already mentioned you've been having webinars through this part year and maybe even prior to that. More so in the context of COVID it has been an evolving field when we first saw our first patients at least at City of Hope somewhere in late March then over a period of time in a variable fashion of frequency of admissions or outpatient diagnosis how it impacted cancer care and those who don't know City of Hope, we are a standalone NCI designated comprehensive cancer center. I've been here at City of Hope for 16 years. Help our oncologists and transplant physicians managing complications related to infections.

Dr. Sanjeet Dadwal:

COVID-19, I'm just going to give some perspectives in the context of cancer. Many of you have already heard this or seen this. This is just a photo of City of Hope. This is Helford Hospital. This is our little garden here. This is what we call the Coronavirus. It has a little Corona around it which is due to the spike protein. You can see this is the spike protein which the virus uses to get into the cells. History of SARS is such which is known as virus which causes severe acute respiratory distress syndrome. The SARS-1 was initially diagnosed in 2002-2003 with high mortality. There's no ongoing transmission. It was in southeast Asia and was actually quickly taken care of. It had very high mortality rates. Then Middle Eastern Respiratory Disease, this is when MERS came out. This is in 2012. Fatality rates were up to 40%.

Dr. Sanjeet Dadwal:

When you contrast that with SARS-CoV-2 which is COVID-19, COVID-19 is a disease which is caused by SARS COVID virus 2. I'll just call it as COVID-19 because it's easy to say that. The fatality rates with that overall is about 2%. Some populations if you look at those patients who have comorbidities like diabetes, elderly patients, that mortality rate goes high and in cancer patients it has been reported as high as 15 to 35 percent depending upon different things like transplant, stem cell transplant, leukemia or it's a solid organ cancer. There's a variable presentation some patients have mild disease others have moderate to severe disease.

Dr. Sanjeet Dadwal:

This is the SARS Coronavirus 2 which is COVID-19 virus. Just is a simple example. This is how the virus looks like. There's the Spike protein which attaches to a receptor in respiratory epithelium and get into the cell where it replicates using RDNA mechanisms to replicate the virus. Then these are some other proteins. But S and N proteins are the main one when it comes down to vaccination or how the vaccine construct is made. This is a slide which I took out from a recent journal which was describing the impact of COVID-19 in an ovarian cancer patient but it applies to actually all cancer patients. At the beginning when this started, and I'll show in the following slides, a lot of challenges I will say in terms of how much hospital beds we had and what the healthcare workers force was, I was in New York City we all know how inundated it was so there were closure of treatment facilities. There were cancellation of surgeries. There's mandatory testing of COVID-19.

Dr. Sanjeet Dadwal:

There were concerns with the delayed diagnosis or delayed screening as a caution of quality of life and alternative managements. Whether somebody is getting changed from an IV chemotherapy to a oral. May be less effective but again, in the context to mitigate risk of acquiring COVID-19 infection in patients of cancer. Epidemiologic considerations. Epidemiology means study of a disease or infection. How it's patterns are and how it relates in relationship to risk factors for developing severe disease or even contracting the illness. As far as COVID-19 goes, the initial part if we all remember back in January, February, was in Washington State it was mainly in nursing homes around in Seattle area. Enclosed spaces at risk meat packing facilities, small concert halls, there was an outbreak in a group of people who were doing symphony where there was flute and singing. Then there's certain groups who are at high risk of worse outcomes and one of the things which we've seen in this pandemic is at elderly patients.

Dr. Sanjeet Dadwal:

Those who are above the age of 65 tend to have worse outcomes as compared to younger people. Then there are comorbidities. Obesity, chronic lung disease, smoking, chronic kidney disease, those who have underlying heart disease and I highlighted cancer and immunocompromised that's what we are here to discuss today and that's what I deal with on a daily basis in terms of managing infections. Also, finding ways how to reduce the risk of transmission of infection within the healthcare setting. This is a study which initially came out of UK and this is the UK COVID Cancer cohort. There were 1,044 patients who developed COVID-19. This is early in the pandemic and this is their national, they have national services. The cohort of all cancer patients which are registered there. They were basically looking at if there was higher risk of getting COVID-19 in patients who had cancer during the pandemic versus their cohort without COVID-19. Obviously you can see whether it is impacted by type of cancer.

Dr. Sanjeet Dadwal:

Breast cancer is here then female genital organs which includes ovary, endometrial cancer or cervical cancer is right down here. You can see 13.7% with COVID, 16% overall cohort and within the female genital organ cancers is 5.4% those with COVID and 6.4%. These were not considered to be statistically significant so it doesn't look like that having breast cancer or an ovarian cancer was putting patients at a higher risk to acquire COVID-19. Now one thing I always like to mention is that COVID-19 acquisition has to do a lot with our surroundings. Who is living with us? Who is going out? What jobs they do and what can they bring home? What is their likelihood of spreading it to others? This is again from the same study. This was published in Lancet Oncology. It basically shows the impact of age on what we call as case fatality rate. Meaning, the rate of somebody who develops COVID-19 and dies of it. Hardly anything between 20 and 39.

Dr. Sanjeet Dadwal:

This is patients with cancer. Then you see it starts going up as we start aging by a group of 10 years here and really takes off here at the age of 60 to 69 where case fatality is almost around 30%. If you're somebody who's above the age of 80, it almost gets up to 50%. Which is really high and even in those who don't have cancer, elderly patients are at the highest risk. This is the cancer type. We look at different things when we ascribe causality to increase risk for complications or death related to an infection like this in the cancer table. What you can see here in the breast cancer it looks like this is what we call as odds ratio. This is the odds of developing a bad outcome if you got COVID-19. It seemed like having breast cancer was being protective. But when we factor in other factors that we call as multi-variable analysis, when we start factoring other things, do we see that somebody have diabetes, AIDS, sex and all that, then it seems like it doesn't make any difference.

Dr. Sanjeet Dadwal:

It does not increase the risk of death or even reduce the risk of death if you have breast cancer or a female genital organ. But if you look at other cancer types like leukemia, there's a significantly high risk of dying if somebody had leukemia and got COVID. Having breast cancer and ovarian cancer doesn't seem like it was increasing the risk of dying from ovarian cancer. That is a little reassuring there. Again, if we pull the cancer type, age, sex and case fatality rates from COVID-19 you can see at the bottom is breast cancer then female genital organs and this is by all patients and this is women here. You can see down here. This green here means it's very low fatality rates but it does increase. As you can see go up to 40% if you're older. This gray zone is that there were less and four patients so they could not make any conclusion as to what the risk would be.

Dr. Sanjeet Dadwal:

This is just one slide which I would like to emphasize later on too when I summarize the presentation is that if you look at the two time periods here, January 6, 2019 to February 29, 2020 then March 1 to April 18, 2020, the amount of screening seems went down because we were seeing very less newly identified cancers. We do know that screenings like mammography, Pap smears, things like that were completely going to halt. The outpatients clinics were not accepting patients. They were going to basically essential care. Just highlighting a point that having this pandemic put a real pressure on screening and prevention efforts we've made all these years. That's just general ideas to how breast cancer and female genital tract cancers may affect the case fatality rates or mortality.

Dr. Sanjeet Dadwal:

Now going to a common question which I get is, what if I get COVID-19? What do I do? If you go by the NIH definition there's a mild disease. These are patients who have cough, cold, fever. May have lost their taste or smell but they don't have shortness of breath. They don't have pneumonia. Their oxygen is more than 94%. Typically, we recommend those patients staying home because there's no FDA approved or EUA treatment for them with the exception of monoclonal antibodies. Here's where I say having a very close communication channel with your oncologist is the key. At City of Hope what we were doing is, or my division, we were actually screening any positive test which was coming in our healthcare system meaning on our Duarte campus and we were proactively reaching out to patients saying that you meet the criteria, would you like to get this antibody?

Dr. Sanjeet Dadwal:

This is under emergency use authorization which I've shown that in patients who are higher risk, if you would give this antibody within three to four days, chances of developing moderate or severe disease or getting hospitalized goes down significantly. In moderate to severe disease is that situation where you are requiring oxygen or have pneumonia and require hospital admission. What are the available therapies? In the US so far only Remdesivir. It is only approved for patients who have moderate to severe disease, hospitalized patients. We have emergency use authorization. There are two Monoclonal antibodies which are available. Then high titer convalescent COVID-19 plasma. This is a plasma taken from those people who have recovered from COVID-19 and have high titer antibodies meaning high level of antibodies and that may protect.

Dr. Sanjeet Dadwal:

The immune modulators we use, this is in patients who get admitted and this is basically to blunt the immune response which the body does in response to COVID-19, what is triggers. Then anticoagulation because there's increased risk of clotting. Finally, prevention with vaccines which became a reality somewhere late December for healthcare workers, frontline people and now to our patients. This I will bypass because we just spoke about that. The other thing which a lot of our patients were concerned about mutants or variants which are coming out. There're different kinds of variants, there's a UK variant,

there's a Brazilian, there's a South African. No we know there are variants from India and also within the country like in California we have variants too.

Dr. Sanjeet Dadwal:

But the major variant now in the US is UK variant. This picture is little about two weeks old and I did not update it yet. But this you can see it's distributing in United States but it is much more now at this time. But South African and Brazilian are still pretty uncommon. What happens is variants are produced by mutations in the spike protein, that little spike protein which attaches to the cells and getting to the cells. What that does is it changes its configuration so that the antibodies which people may have had with the prior infection no longer mutualize this virus. The concern is how does it impact transmissibilities? We know there are more transmissible. Do they cause more severe disease? Well there are reports in UK yes it does. But I think the risk of more severe disease is also because if you have a pool of patients who are at high risk they can get severe illness.

Dr. Sanjeet Dadwal:

Response to treatment. There's no evidence that current regimes like Remdesivir are less effective. We think they are equally effective. There could be a concern in regards to whether plasma will work or the monoclonal antibodies will work. But in terms of vaccinations, we do know that the vaccine offers some protection even against variants. SARS-CoV-2 vaccines. Vaccines as you know are used to induce immune response in a person who previously has been infected or not infected to develop antibodies so the next time bodies sees a virus it does and fights it. There are different vaccine vehicles. It's like I say, payload system. How you have a rocket which takes something into the space. Same way we have a base which carries certain molecules to which the body's going to respond and produce antibodies against the virus.

Dr. Sanjeet Dadwal:

These are vector vaccines AstraZeneca, J&J. They use a adenoviral virus. It's a virus which causes respiratory illness but these are incompetent. They do not replicate in the human body. But they're used to dig those little proteins into the body and the body then reacts to that and produces antibodies. The vaccine which is made by Moderna and Pfizer is a newer vaccine which uses a different mechanism. Here these are mRNA. mRNA is actually produced outside. It goes in and it is released into the cell where then it generates the spike protein which is expressed in the cell. The body then identifies that and induces an immune response. Then we have protein subunit vaccines. This is Novavax. These are spike proteins covered in nano particles. The last one is not yet available in the US. We have Moderna, Pfizer and J&J as again the hold has been lifted by FDA and CDC that is safe to use.

Dr. Sanjeet Dadwal:

Again this is a little more detailed look. AstraZeneca, efficacy was 82% after the second dose with a boost. J&J at 67% but again, it really protects against severe disease. That's what we're trying to prevent as number one, we don't want to get the disease. Number two if somebody does get infected they don't develop a severe disease or get hospitalized. As you can see, Moderna and Pfizer are about 95% and Novavax 96%. This is the City of Hope vaccine. It's still in phase one trials in healthy adults. Our vaccine is unique that we are not just focusing on the spike protein. We are also focusing on this protein which is inside known as a nucleocapsid. Although the spike protein is the one where you see the mutants and variants more often, nucleocapsid seems to stay stable. Having a vaccine which induces an immune response against both and also the nucleocapsid tends to induce immunity against what we call cellular immunity.

Dr. Sanjeet Dadwal:

These are our cells, T cells which are like memory cells. They stay in your body and you get exposed to a virus again at some point later in time, they become active and start basically pulling all aspects of the immune response into play. This vaccine has been shown to induce a very good antibody response as well as T cell immunity response to SARS-CoV-2 virus in animal models and we are also seeing that in our phase one clinical trial healthy adults that it induces a good antibody response and a T cell immunity response. That is important especially in patients who have underlying cancer because we rely not just on antibody, you also want to have a good cellular immunity too. City of Hope vaccine uses a different vehicle. It's a vaccinia virus which is basically attenuated strain of vaccinia. It's known as MVA. Modified Vaccinia Ankara.

Dr. Sanjeet Dadwal:

It does not multiply in the human host and it has a superior T and V cell response. It does produce long immunity and there's actually experience with this vehicle as well. 150,000 have been immunized successfully in the past starting in 1970s. There is a FDA approved drug for small pox and cow pox using this base, meaning vehicle. We've also used this vaccine in our transplant patients with CMV infection. But the COVID vaccine using the same inactivated virus is only for healthy adults at this time. Now there are vaccine related topics which they are increasing concerns. What is the efficacy of vaccine in the cancer patient? Well we don't know. Because all of these vaccine trials they did not include patients who are actively undergoing chemotherapy. Knowing from our experience in the past, patients who are on active chemotherapy, depending upon the type of chemotherapy, vaccine responses are not that great including vaccines like flu.

Dr. Sanjeet Dadwal:

Typically, we wait until the chemotherapy is done. Your immune system is recovered then go to get vaccination. Typically, that's a decision which is made by physician with the patient based upon the patients' overall clinical situation. We do know that COVID vaccine has not been very successful for patients who have cancer of the blood. Meaning leukemia, lymphoma. It has poor vaccine response to the tune of only about 20-30%. There's also a study that came out of Johns Hopkins that patients who have organ transfer like liver, kidney, their response rate was pretty poor too. Patients who undergo chemotherapy, it is my recommendation, always talk to your oncologist about the timing. Chemotherapy regimes have changed so much. Including from breast cancer, for ovarian cancer. Obviously I am not competent to discuss about which chemotherapy to give but we know there are chemotherapies which are very immunosuppressant. Then you may have hormonal therapy which probably does nothing to the immune system so it should not effect the vaccine response.

Dr. Sanjeet Dadwal:

Then we have immune checkpoint inhibitors where there's a concern that it may actually induce a more vigorous vaccine response which may translate into increased side effects. All of those things need to be taken into context. NCCN provides guidelines on SARS-CoV-2 vaccination in cancer patients. Vaccines are recommended even if there's prior history of COVID-19 as patients with weakened immune systems may not develop antibodies with a natural infection. Let's say somebody had infection and they tested the antibodies. They were negative or they had antibodies, those antibodies typically wain over a period of three to six months so they may lose the immunity. These coronavirus have been with us for thousands and thousands of years. There are other coronavirus. We call them endemic. They cause common cold. A person can get the same virus multiple times in a year.

Dr. Sanjeet Dadwal:

It doesn't induce a lasting immunity but there was no vaccine in the past and there was no interest in vaccine because it caused mild illness. But with this pandemic virus, SARS-CoV-2 with its mortality and

its impact, that's how the vaccines came about and it seems like in healthy people or those who have immune system which can react there's a good vaccine response. We do not know though how long that vaccine response is going to last because vaccinations really started in the context of clinical trials back in April or May and in real world and patients somewhere in January or February. The bottom line is prevention is the key until effective therapies are available. We still need better treatments, antivirals which can be taken by mouth. They're easy to give rather than IV and getting hospitalized. Vaccination is the key at this point.

Dr. Sanjeet Dadwal:

Other effective measures, masking, physical distancing, and avoid crowding. What applies to general population really doesn't apply to cancer population. I wish all the authorities made their distinction at the very outset. If you look at these societies, I sit on American Society of Transplantation and Cellular Therapy and ASH and also at NCCN, we make a comment that please do not stop doing what you're doing right now such as physical distancing, masking because you don't know who you're coming in with if they are not vaccinated. Now, some patients or even healthy people who are vaccinated they can still get COVID. They may not get sick at all but they can shed the virus and pass it on. It's very important to be careful. A classic example is India right now. They were very careful all through the pandemic till January and suddenly they let go of all their guard.

Dr. Sanjeet Dadwal:

Only 2% of that country is vaccinated. At least we are better off with vaccination. At least in the state of California we're more than 50% vaccinated and it's going higher and higher. Getting much more population vaccinated is going to help us in the end but what's happening is India is a clear example, there's not immunity and people let their guard down and it's going crazy out there. Acceptance is very important that the way of life has changed and maybe we have to change for the long-haul to combat this pandemic. It's not going to be over this year. There will be little spikes here and there but hopefully it won't be what it was last year around Christmas or January. Having consistent behavior change in the long-run is going to be critical and this is us as healthcare providers, patients, caregivers. It's a whole continuum where this needs to be applied.

Dr. Sanjeet Dadwal:

If it falls in one group, then it's going to impact everybody else. Then example setting. We always need to have role models within the communities, within the hospitals, societies who are going to be passing on this message that it's still very important. Because the thing is if you get COVID and you're a cancer patient, it can delay your cancer treatment which means the disease can progress, there could be more complications if the immunity is weakened. Things we have right now are really not perfect. We still see bad outcomes with COVID-19 in somebody who's severely immunocompromised. I say peace at the bottom because that's prevention, that's effective measures of masking, physical distancing, accepting that we have to change our way of living, consistency with those things and example settings. That's my way of saying peace and I'll take questions. Thank you.

Jenna Fields:

Thank you so much Dr. Dadwal. I took notes the whole time. This was so informative. Thank you. I'm going to keep peace in mind. It's going to have a new meaning for me going forward. Lots of great questions that have come up. I'm going to start with your second to last slide. You mentioned that there are not studies yet that have been done specifically on cancer patients and a vaccine affecting efficacy. Can you address or are there any studies that are starting maybe at City of Hope or somewhere else that are starting to look at that?

Dr. Sanjeet Dadwal:

NIH just declared that they're doing a study where they're asking patients who've received vaccination if they want to get tested for immunity. That's one place. City of Hope, they are doing in genital urinary cancers especially kidney cancer, prostate cancer, there's a clinical trial being run by Dr. Samantha Ball where we are looking at antibody response as well as T cell responses. There are also society based, different societies exist. Lung cancer and others. They could be doing those too. In terms of vaccine trial, I don't know, you just wanted me to address about immunity for now, right?

Jenna Fields:

Yeah. But you can expand.

Dr. Sanjeet Dadwal:

We are also thinking of doing it in the transplant population. But again, at this point if you look CDC as well as the people who make these vaccines, checking for antibody response is not recommended because we do not know at this point having an antibody how high that antibody level is which is protective because you may not get the titer with every test. How long does it last? Those are the key factors. Obviously that information is really missing in cancer patients completely. We don't have that.

Jenna Fields:

You had talked about people with blood cancers. There is measurable less efficacy in terms of vaccines. Is that for people who are currently in treatment or people who are also completed with treatment?

Dr. Sanjeet Dadwal:

Well mostly these are patients who have conditions like lymphoma or CLL who are actively getting treatment or recently out of treatment. We've had patients who have had CAR-T for lymphoma and they got the vaccine a year later, they still could not produce any antibodies. It all depends. That's why having a dialogue with a physician is so important that, "Hey, I got this chemotherapy or this treatment. How long does my immune system stay low before it becomes competent again? What's the best timing for vaccination?" Things of that sort.

Jenna Fields:

Following up on that. We did receive a lot of questions about chemotherapy specifically and timing of vaccine. You mentioned in your talk that's a really personalized question that people should be asking their doctors. From your observations, you have a sense of long people can wait or is there any window that you can share with us or is it just too specific?

Dr. Sanjeet Dadwal:

Again, I'll break it down into two parts. Number one, somebody's on a routine treatment. Meaning they're not on clinical trials. Clinical trial has a different context as to whether they allow the vaccine, they don't allow the vaccine, that's a EUA vaccine. But for the most part I think they have made that exception. They now allow EUA vaccines too. The point is, when do you give it? We had dialogue with our oncologists because there's so many different regimes now. Let's say for example you have breast cancer. You can have just hormonal therapy or it could be chemotherapy with targeted therapy, [inaudible 00:33:36] things of that sort. What we have to look at is, what is the timing? If there's time you can wait to start chemotherapy, we typically say give vaccine at least two weeks before starting chemo.

Dr. Sanjeet Dadwal:

That's the first. But then the second shot has to be given 28 days later. Now 28 days later if you have white cell count of 0.5 then you may not respond to the vaccine. I really think it has to be based upon what is the frequency of cycle of different chemotherapy. Is it hormonal therapy? Is it targeted therapy? If it is targeted we don't care. Go ahead and vaccinate because it doesn't really affect your white cell count or your lymphocyte count. Somebody is on steroids, let's say they got immune checkpoint inhibitor and they develop side effects and now they're on steroids and the vaccine became available, we do know that high dose steroids do not allow any vaccine response. It's very poor. We wouldn't recommend vaccinating then. Those are the caveats.

Jenna Fields:

Got it. For a population that is maybe about to go into surgery or radiation, are there those same concerns or is it really chemotherapy where the concerns lay?

Dr. Sanjeet Dadwal:

It could be a concern with radiation treatment too because that also affects the immune response. Surgery I'd say it's a very short period where you would say don't get it within a week or so. But I don't think going in for surgery, let's say it's mastectomy and it's localized radiation I would still go ahead and vaccinate that person.

Jenna Fields:

Okay. Thank you for addressing that and expanding a little bit more. I did get quite a few questions. I'm going to get through as many as I can. Someone wrote they thought that, I know this is something that we are still trying to understand from the news, but if you get the vaccine you can't spread it anymore. You can't spread the virus. Can you elaborate on whether that's true or not?

Dr. Sanjeet Dadwal:

From what I know, the Johnson vaccine was the one which actually showed that it actually cuts the transmission also. But on the other side, if you look at Pfizer and Moderna, it was 95% perfect in terms of efficacy but 5% it wasn't. You have those people who may not respond, I'm sorry, they responded to the vaccine, didn't get sick but they got the virus. They have a mild disease. They have the virus and they're shedding the virus then there is always a concern they can spread the virus.

Jenna Fields:

Right.

Dr. Sanjeet Dadwal:

Especially more likely to spread it because they are more likely to be asymptomatic and they're less likely to stay away from others.

Jenna Fields:

Okay. That makes sense. Just to follow up on radiation, someone asked about past radiation. Does that effect immune response to COVID?

Dr. Sanjeet Dadwal:

It depends. It depends upon the dose. We say typically probably wait two to four weeks post radiation. At least four weeks if somebody could.

Jenna Fields:

Okay. But a year ago, that's not a concern?

Dr. Sanjeet Dadwal:

It should not be a problem.

Jenna Fields:

Okay. I know, it sounds like you're getting a little bit muffled. I'm just going to ask you to...

Dr. Sanjeet Dadwal:

Sorry.

Jenna Fields:

We did get a few questions regarding pregnancy. We do actually have a large population who's also increased hereditary risk. Specifically BRCA as well as other mutations we've check too. Can you speak to some of the concerns that are going around about pregnant women getting the vaccines and any concerns for people who maybe have hereditary risk for cancer?

Dr. Sanjeet Dadwal:

There's not much out there. CDC does not advice against vaccination even of pregnant women. That's probably all I would say. But disclaimer that being at a cancer hospital I've not seen a pregnant patient in 16 years.

Jenna Fields:

That's fair.

Dr. Sanjeet Dadwal:

That would be overstepping my bounds.

Jenna Fields:

Is there a resource you can recommend for anyone who does want that information?

Dr. Sanjeet Dadwal:

I can find out and email you.

Jenna Fields:

That would be great. Thank you Dr. Dadwal. In terms of, someone asked specifically about the efficacy of shingles vaccine and if it impacts the COVID-19 vaccine but maybe even more generally if you've had a vaccine for something else can that effect the COVID vaccine effectiveness?

Dr. Sanjeet Dadwal:

I don't think so. There shouldn't be any impact in reducing the vaccine efficacy if you got any vaccine in the past. The only thing we say is try to space the vaccine by at least two weeks. It becomes a little murky which vaccine gave you side effects if you put them together. Space it out by at least two weeks. That's the recommendation if you get a flu shot then make sure you take at least two weeks prior to the COVID vaccine or two weeks after the second dose.

Jenna Fields:

Great. I'm going through all these questions while listening to you so I apologize for the delay. Can you talk a little bit in terms of the City of Hope is doing this clinical trial it's really interesting to hear about how you're addressing the inside of the virus instead of the spike proteins. That was a really great visual. Are there other studies like that happening around the world or is this really specific to City of Hope and what do you think the chances are of us seeing a vaccine like that maybe this year?

Dr. Sanjeet Dadwal:

Well we're making full efforts in getting the phase one done. That's 126 patients. The enrollment is ongoing. Again, as I said the vaccine uses two targets instead of one. It's also effective against variants. I do know other people have researched on that. But at least in the US I don't see any other trial which uses a vaccine model where you're using two targets. That's one. We are looking at possibility of expanding this as a phase two trial in certain cancer population. But we're still in preparation state. I can't say more than that. That's on the vaccine. Beyond the vaccine we have a phase one trial of using a drug which is used for rheumatoid arthritis for treating patients who have severe disease. Because it actually cuts the viral replication and also reduces the inflammatory response.

Jenna Fields:

Do you think that trial will be completed soon?

Dr. Sanjeet Dadwal:

No. Our numbers are down in LA so much.

Jenna Fields:

It's hard to find participants. It's a good problem to have in some ways.

Dr. Sanjeet Dadwal:

I would rather have no patients and wish them the best and good health.

Jenna Fields:

Are there other studies like that though happening in other places around the country? Treatments specifically for people who have COVID who are also getting cancer treatment right now?

Dr. Sanjeet Dadwal:

This study we have, which is for leflunomide, specific for cancer and it is actually funded by NCI and Philanthropy and City of Hope. Similar studies just targeting cancer, no. It's all comers. There are other studies. There's small molecule studies, different pharma studies which are coming into picture. There's a new antiviral by Merck which is coming out. It's given as a pill. Shows promise but is still in phase two trials. There's nothing which is close to access to patients yet.

Jenna Fields:

Got it. Okay. Can you talk a little bit about the side effects of the vaccine? Or are there any difference in people who are in treatment or survivorship expect in terms of side effects? If you have more side effects does that increase your level of protection?

Dr. Sanjeet Dadwal:

The side effects in relationship to vaccine, again as I said this is basically available from clinical trials. That's number one with Pfizer, Moderna and J&J. Then we are putting it out into general public and you're hearing things through the Vaccine Adverse Event Registry VAERS database. People reporting to that. Those things are still being looked at, what is going on and you see in the news what really stands out like clotting and other things but that's extremely rare. The most common side effects are injection site discomfort. Some patients may develop fever. Some may get joint pain. One of the thing we've been seeing is development of swollen lymph nodes in the armpit or the neck. How that poses issues for patients who may have cancer, is it cancer related? Is it treatment related from the vaccine? Those are the key things. For the most part we don't believe that there should be any difference in the side effect profile between a cancer patient and general population.

Jenna Fields:

Okay.

Dr. Sanjeet Dadwal:

Our transplant population looked at their patients, they're writing a study of a paper now and they saw that the vaccine was pretty safe in them too. We don't know whether it was effective but it was safe.

Jenna Fields:

Can you address booster shots for obviously when you address concerns around variants do we expect to all be getting booster shots in a year from now or sooner?

Dr. Sanjeet Dadwal:

Don't know to be honest with you. There's no guidance in that at this point in time. We don't know how long the vaccine effect lasts. If it like any flu vaccine where the impact goes down and your immune variants are coming all the time, flu at least it's an annual thing. This virus it's not limited by season. It's all over the year. It's been in summer, winter, spring. It's not a seasonal virus. You really cannot predict when that variation is going to come, with flu you can do that. Whether we're going to do a booster or not I don't know. My gut feeling, probably yes. But at this point there's no recommendation.

Jenna Fields:

Okay. Someone asked about your rheumatoid treatment. What exactly are you researching?

Dr. Sanjeet Dadwal:

It's a drug known as leflunomide which is given by mouth for patients who have rheumatoid arthritis. Rheumatoid arthritis patients take it for months and years. Here it's available on clinicaltrials.gov. We give the first loading dose and one pill a day for 14 days. We're basically measuring the response to treatment by seeing how much virus is being shed in the nose. We take samples every other day. We take blood samples for assessment of antiviral levels in the blood and we also do liver tests and other tests to make sure it is safe. So far we've not seen any safety concerns.

Jenna Fields:

That's great. So many questions I want to make sure that we get to. People who maybe are still feeling concerns around the vaccine because as you're sharing, we're studying so much in real-time, what would you say to them?

Dr. Sanjeet Dadwal:

I would say, vaccine is probably the best option available along with what we've been doing. Masking, hand washing, hand hygiene, physical distancing. But vaccine decision making really should happen with your physician. That is very important to know because your physician can guide you. You can take vaccine right now but it's not going to do anything for you. In my hospital we say that if you're on steroids, more than half a milligram per kilogram, of your body. If somebody's 70 kilos and they're getting 40 milligram prednisone, please don't get vaccinated because it's not going to do any good to you. It may give a false sense of security that, "I'm vaccinated. I'm fine." That should not be the case. Same if you're in chemotherapy. Certain chemotherapies, please talk to your doctor. If you're in a survivorship phase, you're a year out from your cancer treatment, you're not on anything, then it's fine. Go ahead and get vaccinated.

Jenna Fields:

For people who haven't been able to take the vaccine yet for any of the reasons you've described, do you have recommendations for them keeping their immune system strong right now?

Dr. Sanjeet Dadwal:

There's really no other way. It's just be meticulous and staying away from somebody who could have the virus. If I have my household, the only person who's not vaccinated is a 10-year-old. My 10-year-old is actually so meticulous because he has a 75-year-old grandma at home. She's vaccinated but when he goes to school he's double masking. He's probably the role model for the whole class and for our house too. Especially for my 18-year-old son. He tells him, "Hey, you can't go there you'll bring it to grandma. You don't know how the vaccine works." I think if you're in that group which cannot respond to vaccine at this point and delaying vaccine, then the key part is make sure everybody around you gets vaccinated. That's number one.

Dr. Sanjeet Dadwal:

We've been harping for a long time to authorities that for cancer patients, please have their relatives or caregivers fully vaccinated so you have a wall of defense around them so that way they will not bring it at home. All the cancer patients we had at City of Hope who had severe disease it often turned out to be a child coming back from work or traveled somewhere. Came and gave it to father or grandfather then they ended up in the ICU. That's a key part. Surround yourself now once the vaccine is fully available in greats part of the country so go ahead and get vaccinated and keep your loved ones safe who are getting chemo or who don't have adequate immune system yet in place.

Jenna Fields:

Can you share in terms of children getting vaccinated, my pediatrician says it's going to be maybe December or January. Maybe other pediatricians are saying something else. But do you have any reservations in terms of vaccinating children? Or anything you would recommend to parents around that?

Dr. Sanjeet Dadwal:

Personally, I don't have a concern. I even asked by 10-year-old if he wants to participate in a clinical trial. He told me no. He said no.

Jenna Fields:

Sorry dad.

Dr. Sanjeet Dadwal:

He gave me good reasons. But I think it's already approved for above the age of 16 for one of the vaccines I think. Pfizer is applying for EUA to give it for kids above the age of 12. I know there are clinical trials between the age of 6 and 18 too ongoing. That's all I know for now.

Jenna Fields:

Is there any advice you would give to... This I think is a very important conversation that we're having also I think sobering especially in light of the mask announcement yesterday. It can be a little deceptive especially for people who are maybe still facing treatment or are in survivorship the community that is on this call today. Can you share some tips around having this conversation with family and friends who maybe feel like things are opening, we don't need the same concerns anymore?

Dr. Sanjeet Dadwal:

We have FAQ's for our patients which are listed on City of Hope's site. We clearly made a point when CDC came out a little while ago that if you're vaccinated you can take off your mask and you can get together in your house five or 10 people. We made that recommendation very strongly to our patients that even if you're vaccinated but you're on chemotherapy or you're on immunosuppression after transplant, we do not know whether you are protected or not. There are already cases actually of multiple myeloma patients who got vaccinated and got severely sick with COVID because they never mounted an immune response. That may not be true for breast cancer patients or ovarian cancer patients, especially those who are in survivorship. Or even those who are on targeted therapy. That risk is not the same. It's a completely different population.

Dr. Sanjeet Dadwal:

The point I'm trying make is that when you do not know or you know and you vaccinate somebody who doesn't have adequate immunity because CDC said even if you have 10% chance, 20% chance of inducing an immunity, go ahead and get vaccinated. But in essence we don't know. In that context I think it becomes very important for the person who's undergoing treatment as an advocate for themselves talk to their kids in a very nice open fashion and say, "We miss you. We want to be around you. We want to hug you but here's the story. This is what's happening to me." Those parents who are younger and have cancer and maybe they have kids, it's even tougher because the kids have to go to school, they're coming back and they could bring it but we can emphasize to those kids, "Hey, don't take your mask off at school. Wash your hands." But kids are kids. That we cannot run away from. But whatever we can do I think we should make full effort in doing so.

Jenna Fields:

Great. I think it would be great if we could have that resource that we could send out following the webinar that City of Hope created.

Dr. Sanjeet Dadwal:

I'll ask our legal folks if they can.

Jenna Fields:

Okay. If it's possible. If it's not possible. Also think I should plug our social work team for anyone who's having challenges navigating difficult conversations with your family. We are also available to talk with you about that. Is there a way to test if you have developed any immunity? Is there any value in antibody testing at this time?

Dr. Sanjeet Dadwal:

At this point as it stands CDC and the people who make vaccines and even the disclaimers of the companies which do the testing is we do not know how to integrate the tests. You may have the antibody and you still make not be immune. A healthy person, fine. You have the antibody. You're potentially immune based upon the vaccine trials because it's 95% efficacious but the recommendation is not to test. That's what it is. But if you want to get tested it's probably best to find a clinical trial because at least they will be sending out a correct test. We've already seen some of our physicians order an antibody test because the patient wants to be tested and they put in the wrong test.

Dr. Sanjeet Dadwal:

They ordered a test which measures N protein antibody. You don't need that because that only happens with natural infection. Because none of the vaccines have the nucleocapsid protein yet. You need a spike protein specific IGG antibody at specific labs. That's very important. I would encourage if you can find any local place they are running a research protocol where they're doing antibody testing, that would be the best way to do it.

Jenna Fields:

Is there a place where our participants can go to find those clinical trials? Is there a good central hub?

Dr. Sanjeet Dadwal:

One is clinicaltrials.gov. The other is always look at NIH and respective societies like leukemia and lymphoma society they're sponsoring a study so they have it on there. If there's a breast cancer consortium or study, go to that site and see if they have it there.

Jenna Fields:

Great. Well Dr. Dadwal, we could keep this conversation going. We so appreciate your time and expertise. I think we got to most of our questions but I know not all. Dr. Dadwal very kindly offered to answer a few more which we can send out afterward. I want to thank you and everyone for joining this call today. Please if you're interested on our three upcoming webinars we hope that you sign up. My colleagues will put those links back in the chat for you right now. You can also sign up for our free survivorship kit which we'll put back in the chat as well. Just click to that link. Thank you to our sponsors City of Hope, Merck and Seegene for your support and we look forward to seeing you all next week. Thank you again.

Dr. Sanjeet Dadwal:

Thank you very much. Bye.

About Sharsheret

Sharsheret, Hebrew for "chain", is a national non-profit organization, improves the lives of Jewish women and families living with or at increased genetic risk for breast or ovarian cancer through personalized support and saves lives through educational outreach.

With four offices (California, Florida, Illinois, and New Jersey), Sharsheret serves 150,000 women, families, health care professionals, community leaders, and students, in all 50 states. Sharsheret creates a safe community for women facing breast cancer and ovarian cancer and their families at every stage of life and at every stage of cancer - from before diagnosis, during treatment and into the survivorship years. While our expertise is focused on young women and Jewish families, more than 15% of those we serve are not Jewish. All Sharsheret programs serve all women and men.

As a premier organization for psychosocial support, Sharsheret's Executive Director chairs the Federal Advisory Committee on Breast Cancer in Young Women, Sharsheret works closely with the Centers for Disease Control and Prevention (CDC), and participates in psychosocial research studies and evaluations with major cancer centers, including Georgetown University Lombardi Comprehensive Cancer Center. Sharsheret is accredited by the Better Business Bureau and has earned a 4-star rating from Charity Navigator for four consecutive years.

Sharsheret offers the following national programs:

The Link Program

- Peer Support Network, connecting women newly diagnosed or at high risk of developing breast cancer one-on-one with others who share similar diagnoses and experiences
- Embrace™, supporting women living with advanced breast cancer • Genetics for Life®, addressing hereditary breast and ovarian cancer
- Thriving Again®, providing individualized support, education, and survivorship plans for young breast cancer survivors • Busy Box®, for young parents facing breast cancer
- Best Face Forward®, addressing the cosmetic side effects of treatment
- Family Focus®, providing resources and support for caregivers and family members
- Ovarian Cancer Program, tailored resources and support for young Jewish women and families facing ovarian cancer • Sharsheret Supports™, developing local support groups and programs

Education and Outreach Programs

- Health Care Symposia, on issues unique to younger women facing breast cancer
- Sharsheret on Campus, outreach and education to students on campus
- Sharsheret Educational Resource Booklet Series, culturally-relevant publications for Jewish women and their families and healthcare Professionals

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