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Reviewing RSV in Immunocompromised Adults

Announcer

You're listening to *Deep Breaths: Updates from CHEST* on ReachMD. This series is produced in partnership with the American College of CHEST Physicians.

Here's your host Dr. Ryan Maves, Professor of Infectious Diseases at Wake Forest University School of Medicine.

Dr. Maves

Welcome to *Deep Breaths: Updates from Chest* on ReachMD. I'm Dr. Ryan Maves, and joining me to discuss respiratory syncytial virus, or RSV, in immunocompromised adults is Dr. Kelly Pennington. Dr. Pennington is an assistant professor of medicine at the Mayo Clinic in Rochester, Minnesota, where she practices transplant pulmonology, as well as critical care.

Dr. Pennington, welcome to the program.

Dr. Pennington

Thank you so much, Ryan, for having me. Today on the program. I'm excited to talk to you guys about RSV today.

Dr. Maves

Me too. So to start off, Dr. Pennington, how common is RSV in immunocompromised adults?

Dr. Pennington

Well, I think that's a really hard question to actually answer because we really don't understand the true impact of RSV right now. I think there's a lot of reasons for that. One is that we don't always test for RSV when we're looking at a patient who may just have simple upper respiratory infections. We're probably a little better at doing that in our transplant population, specifically our bone marrow transplant patients and our lung transplant population. If we look at retrospective cohort studies, and those two primary populations, bone marrow transplant and lung transplant, the annual incidence is estimated to be somewhere between five to 15 percent. But it may be that we're only picking up here those more severe infections are those that come to clinical detection where we would actually be testing for RSV. So I think overall, we're not sure the actual incidence may be much higher than what we've seen, or what has been recorded in these cohort studies.

Dr. Maves

Yeah, absolutely. Figuring out the absolute rates of a lot of these infections has been very challenging, even for something that we have pretty robust surveillance data for, like influenza. So with all that in mind, though, how does RSV compare to other seasonal viruses in this population, at least as a relative contributor to disease?

Dr. Pennington

Yeah, I think RSV is still pretty common in both the solid organ transplant and stem cell transplant populations. There have been some estimates that RSV is responsible for up to 30 percent of viral respiratory infections in the stem cell transplant population and up to about 20 percent in our solid organ transplant patients. Now I don't think by any means that it's the most common respiratory viral infection that our transplant patients face, but it is probably one of the more common viruses. I think what makes RSV a little bit different than let's say rhinovirus, which may be more common, is that our transplant patients specifically have a tendency to develop severe infections with RSV, specifically lower respiratory tract infections. It's estimated that about 50 percent of solid organ transplant and stem cell transplant patients are at risk for developing viral pneumonia requiring hospitalization or even ICU stay. And some cohort studies even suggest that approximately 15 percent of patients who develop these lower respiratory tract infections actually will develop a bacterial co-infection or bacterial pneumonia. That probably happens because RSV is damaging the epithelial lining in the lungs making

them more susceptible to developing these bacterial co-infections or bacterial pneumonias. But the impact of developing an RSV infection or lower respiratory tract infection in our immunocompromised patients is pretty significant.

Dr. Maves

So, Dr. Pennington, when we talk about RSV, most of the time in a broad population, we're talking about children, about the pediatric population. Is RSV transmitted in a similar way as in children when we look at immunocompromised adults?

Dr. Pennington

I would say largely, yes. It's still a respiratory droplet with seasonal variation, and most of the time, it's community-acquired. I think what can be different for our immunocompromised patients that's worth mentioning is that they may have more of a tendency to have nosocomial outbreaks, particularly, if you're looking at just transplant wards or transplant units. For bone marrow transplant patients there have been some studies out there to suggest that up to 50 percent of RSV infections and recent bone marrow transplant patients is actually secondary to nosocomial outbreak. So it's really important that in these populations that we really focus on prevention, so good hand hygiene, masks, and gowns, when it's appropriate or when someone develops RSV infection in a hospitalized setting.

Dr. Maves

For those just tuning in, you're listening to *Deep Breaths: Updates from Chest* on ReachMD. I'm Dr. Ryan Mavis, and today I'm speaking with Dr. Kelly Pennington about RSV in immunocompromised adults. So now that we know how common RSV is and how it's transmitted, Dr. Pennington, let's switch over to patient outcomes. Can you explain what this might look like at least in broad transplant populations?

Dr. Pennington

Yeah, thanks, really as we discussed earlier, lower respiratory tract infection, we believe in our solid organ transplant patients and bone marrow transplant, specifically lung transplant and bone marrow transplant, is really up to about half of cases that are coming to medical attention for RSV. The mortality from RSV infection is fairly high. It's somewhere between 10 and 15 percent attributable mortality for both our bone marrow transplant patients and our lung transplant patients. Other solid organ transplant populations, such as heart transplant or kidney transplant patients, may not have as severe of disease or complications as our lung transplant patients have. It's very likely that their risk of developing severe disease is more than that of an immune-competent patient. There are several risk factors that may increase a patient's risk for mortality or severe infection. And really, I think most all of those come down to the degree of immune suppression, particularly T cell immunity. So the more lymphopenic patients are, the more at risk they're going to be for complicated disease, or even mortality from RSV. The other potential risk factors, really the extremes of age, so younger patients and those that are over 60 years of age, if you put that also in the setting of an immune-compromising condition, those risk factors are just compounded for the patient to have difficulties with this infection. Aside from mortality and severe infection, there are other things that are long-term sequelae or potentially long-term sequelae of RSV infection, particularly in the bone marrow transplant and lung transplant population. And that really is morbidity or reduction in their lung function. So for our bone marrow transplant patients, they can have up to a 10 percent decline in their FEV one from an RSV infection. It's believed that this sets them up to develop BOS or pulmonary graft versus host disease. For lung transplant patients, sort of a similar physiology, and that they're really at increased risk for developing CLAD following an RSV infection. So there really can be long-term sequelae from this infection in our transplant populations that's beyond just mortality or ICU stay from an acute pneumonia.

Dr. Maves

So taking all of that into account, are there then specific risk factors that may increase the risk of severe disease in this population?

Dr. Pennington

Yeah, let's look at our two populations that we've been talking about here separately to look at specific risk factors. So first, our bone marrow transplant population, as we just discussed, really is the degree of immunosuppression increases the risk for both mortality and lower respiratory tract infection. So there are certain factors in our bone marrow transplant population that increase their degree of immunosuppression. So of course, severe disease is going to be more common in those who are allogeneic transplant recipients, those who are pre-engraftment, those who have graft versus host disease, specifically, those who have pulmonary graft versus host disease, it's likely that structural lung disease in addition to the degree of immunosuppression increases the risk of lower respiratory tract infections, and those that have received Milo ablative therapy. Looking at our solid organ transplants population, really the best study group is our lung transplant patients. We do believe that lung transplant patients out of all the solid organ transplant groups are at the highest risk for developing severe infection from RSV, as well as complications from RSV. Once again, though, it's the degree of immunosuppression that seems to set these patients up for having risk for developing lower respiratory tract infections. So those patients that have had recent treatments for acute rejection, those who have received lymphocyte depleting agents, such as at GAM or RA TG, those who are significantly lymphopenic are going to be at increased risk for developing severe lower respiratory tract infection. Once again, structural lung disease likely predisposes to severe infection or increases the risk for severe infection. So our lung

transplant recipients who already have a diagnosis of chronic lung allograft dysfunction are likely going to be at higher risk for developing severe infection.

Dr. Maves

Thank you very much. So to bring this all together, Dr. Pennington, what should our listeners take away from our discussion about RSV infection in immunocompromised adults?

Dr. Pennington

I think if I were listening to this podcast, the one thing I would want you guys to take away or the one thing I would want you to take away is that RSV is a significant problem in our immunocompromised patients. Bone marrow transplant and lung transplant patients are definitely the best studied. We have the most retrospective cohort data on those two populations. But from what we know RSV infection seems to be relatively common. We don't know the true impact in all of our immunocompromised hosts population. We do know that severe lymphopenia increases your risk of lower respiratory tract infection, severe disease, and mortality. But it's not even just mortality or ICU time that RSV can cause for these patients really can cause a decrease in lung function following effects, and those effects can really be long-lasting for immunocompromised patients.

Dr. Maves

Well, thank you so much for that. And with these final takeaways in mind, I want to thank my guest, Dr. Kelly Pennington, for joining me in today's discussion. Dr. Pennington, great speaking with you, as always.

Dr. Pennington

Thank you so much.

Announcer

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