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Identifying the Impact of RSV in 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 the impact of respiratory syncytial virus, or RSV, infections in adults is Dr. Megan Conroy, who's an assistant professor of medicine at the Ohio State University in Columbus.

Dr. Conroy, welcome to the program.

Dr. Conroy:
Thank you, Dr. Maves. A pleasure to be here.

Dr. Maves:
So let's dive right in, Dr. Conroy. So RSV is a seasonal virus responsible for respiratory infections, and it's most commonly recognized for the significant disease it causes in infants and young children, such as bronchiolitis and the like. So then how common is infection, or severe infection specifically, from RSV in adults?

Dr. Conroy:
Yeah, absolutely. I think a lot of the lay public understands RSV, or knows RSV, in the context of reports, really the very significant disease it can cause for children. And in adults, it's not very well monitored how many total infections of RSV we have in the U.S. per year. In comparison to something like influenza, where we have very large monitoring systems from our public health entities to track influenza infection throughout the year. We don't have something similar for RSV. But over the last years and decade really, there's been a really big expansion of extended viral respiratory panels that can tell us in a variety of upper and lower respiratory infection symptoms, the viruses that are responsible for this, and I think, throughout that time we've become more aware of the really high prevalence of RSV in adults. What was prior just an influenza-like illness, not otherwise specified, turns out a significant proportion of those are respiratory syncytial virus infections. And it's hard to give you numbers exactly of how many RSV infections there are per year in adults because of that poor tracking, but it's really common in the community. It's expected that probably most individuals have been infected by RSV by the time they turn two. And unfortunately, immunity to RSV does not last, and so those childhood infections do not provide long-lasting immunity, and being a seasonal virus, really can come up year over year. It's estimated that RSV probably accounts for more than a million healthcare visits in a year, up to 100,000 hospitalizations, and may account for six to 10,000 deaths a year in adults over the age of 65. So it's really an important cause of respiratory disease in adults and in older adults.

In all comers, maybe five to seven percent of upper respiratory tract infections in adults in a given season are due to RSV. And there's varied amounts, but among hospitalized patients with respiratory infections, it may be up to ten percent of patients admitted with community-acquired pneumonia that have RSV.

As I mentioned, this really is a seasonal virus, though, and it peaks usually, more typically between November and March, and at its peak may have nine time higher incidence than it does at it's trough during the summer years. So overall, the question is a little hard to answer of how often are adults infected with this. But frequently enough that it certainly can cause a meaningful proportion of respiratory disease in adults, accounts for a number of hospitalizations, and far too many deaths per year.

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Dr. Maves:
Thank you very much for that overview. So how is RSV spread? Can you tell us what types of measures we can take to reduce the risk of infection?

Dr. Conroy:
Yeah, absolutely. So RSV is predominantly spread by droplet transmission, as with most respiratory viruses. And as with most viruses, it does have some capability to spread by aerosol. Those aerosols probably don't travel very far, just a couple of feet. And RSV, unlike other respiratory viruses, has the ability to spread by fomite transmission. So that being these respiratory droplets that land on surfaces, land on hands, can be stable for several hours. And so in hospital settings, when you have a patient who has RSV, this becomes important to know because not only do we need to institute droplet precautions, those being a mask and eye protection that we're all very familiar with, but also includes contact precautions, so gowns and gloves. To reduce the risk of infection, really all the typical things that we've heard of in many recent years of staying home when you're sick, avoiding contact with sick people if you're going to be around people who you know to have respiratory infection, protecting yourself from those droplet precautions. And really, up until recently, we haven't had very many opportunities to, beyond these behavioral interventions, help to reduce the risk of infection. As I mentioned prior, natural infection does not give prolonged immunity. We see that just a year after infection with RSV, 75 percent of people have had over a four-time reduction in anti-RSV neutralizing antibodies of IgG and IgA. And so it really doesn't last very long. But thankfully, there's actually two new FDA-approved vaccines for individuals aged 60 and over that is highly efficacious in preventing RSV infection. At present, it's just one shot of each of these vaccines and can provide anywhere from 80 to 90 percent protection in the development of RSV and really great profile for preventing severe RSV infection. So for a subset of people that may be an option to help prevent infection, and for the rest of patients who are under the age of 60, then really continuing to take these many behavioral interventions that we know can have meaningful reduction in risk of infection.

Dr. Maves:
Absolutely. Now with that information in mind, Dr. Conroy, how does RSV infection impact adults with lung disease specifically?

Dr. Conroy:
RSV certainly has the ability to cause more severe disease in people who have underlying lung disease. As you mentioned earlier that a syndrome of bronchiolitis that we see in very young children, RSV really has the ability to impact the airway lumen and endothelium within the airway and cause significant inflammation in that space. And so in holding with this type of pathophysiology, we do see that RSV has significant impact for patients with obstructive lung disease, so COPD or asthma. RSV is probably a pretty common culprit for exacerbations of these obstructive lung diseases. As those who treat them know risk viral infections are a very common cause of exacerbations of asthma and exacerbations of COPD. It's hard to quantify exactly how often RSV is that culprit, but given its significant prevalence and presence in the community, particularly at peak season, it is likely a very common driver of that.

Often, we do see COPD as a common comorbidity admitted to the hospital in patients who have RSV or are admitted with RSV infections. Probably more so than asthma. And that may speak to some of the age differences and likelihood to develop severe infection with RSV as we have waning immunity as we grow older and a general likelihood for COPD to be present among older individuals than it is younger individuals. But there are other risk factors even aside from lung disease, and aside from obstructive lung disease, that can put patients at high risk for severe disease from RSV; things like underlying cardiovascular disease and immunosuppressant.

Dr. Maves:
For those just tuning in, you're listening to ReachMD. I'm Dr. Ryan Maves, and today I'm speaking with Dr. Megan Conroy about the impact of RSV infection in adults.
Now, Dr. Conroy, we have some background information on RSV infection in adults with lung disease, but are there other comorbidities that are also uniquely impacted by RSV infection?

Dr. Conroy:
Yeah, absolutely. So as I mentioned, RSV is a common cause of exacerbation of obstructive lung disease, but it also is probably an underrecognized cause of exacerbation of congestive heart failure, or CHF. And adults who have CHF and get infected with RSV are actually eight times more likely than adults without CHF to become hospitalized. Those are the other cardiovascular disease and underlying coronary disease are also at risk for severe disease from RSV, and we do see an interplay between RSV infection and cardiovascular events probably from an increased systemic inflammation that comes as a consequence of viral infection.

We also know that age is a pretty big factor. And those patients who are of more advanced age really increasing risk after age 50, age 65, are more likely to require hospitalization with RSV. And in particular, immunosuppression or immunocompromise is a unique risk factor for severe respiratory syncytial virus infection. Those lower respiratory infections and pneumonia up to and including those who are admitted to the hospital with RSV and underlying immunocompromise are probably about 25 percent of those patients actually end

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up requiring intensive care unit admission because of the severity of the critical illness that they develop from RSV infection. And so immunocompromise in particular is a very significant risk factor to develop very severe infection from RSV, potentially even life-threatening.

Dr. Maves:
And then how do outcomes from RSV infection compare to outcomes in patients admitted with say, influenza?

Dr. Conroy:
Yeah. I think we all have this mental model of the badness that seasonal influenza can do. And I do sometimes think it's helpful to conceptualize viruses within that model and in comparison to it. Unfortunately, RSV among patients who end up getting hospitalized with it seems to be more severe. RSV compared to influenza seems to be a cause for greater length of stay in a hospital and a length of stay greater than a week. It seems to be more likely to lead to a lower respiratory tract infection and developing of pneumonia, lower oxygen concentrations, more hypoxemia. It may be more likely to lead to an exacerbation of COPD, and when we look at individuals admitted for influenza and admitted for RSV, RSV seems to actually carry a higher mortality among that. And those admitted with RSV seem to be at higher risk for more subsequent hospitalizations within six months of that index hospital stay.

And so while RSV on the whole tends to be a mild respiratory infection for adults, among those who progress to severe infection from RSV to necessitate hospital admission, it seems that in comparison to influenza, we actually have worse outcomes for those patients. Now thankfully, on the whole, RSV is responsible for fewer admissions and fewer deaths annually than influenza but is still very significant. And among those who do reach severe disease can really be a very complicated course.

Dr. Maves:
Thank you very much for that. Now as we come to the end of today's program, Dr. Conroy, are there any key takeaways you'd like to share with our audience?

Dr. Conroy:
Yeah. I think recognizing the general public health importance of respiratory syncytial virus in adults is pretty important. We started out today by framing the lay public understanding RSV largely as a disease of consequence for smallest children, but it really is a regular cause of respiratory infection in adults, and especially, those with more advanced age with underlying lung disease, cardiovascular disease, congestive heart failure, and immunocompromise of any etiology. There is a significant risk for severe disease and bad outcomes, including mortality. RSV's responsible for thousands of deaths every year among those age 65 and older. And while we haven't, up until now, had really great ways to specifically arm ourselves with prevention or treatment mechanisms with the advent and FDA approval of several new RSV vaccines, we're really entering a new era where this very significant infection of public health importance can be manipulated. And where, in talking with our patients and helping to vaccinate them, we may be able to really reduce the impact that this virus has.

Dr. Maves:
Well, that's absolutely something for us to look forward to. Thank you so much. With those considerations in mind, I want to thank my guest, Dr. Megan Conroy, for joining me in today's discussion. Dr. Conroy, it was great speaking with you today, as always.

Dr. Conroy:
Thank you Dr. Maves.

Announcer:
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