Do you have any preferences or leave it up to a person's personal experience? Or any comments or do you want to decline?

RC: Yeah, it's tough.

I mean, part of it is, you know, a lot of these institutions, not certainly, not everybody, but a lot of institutions have ongoing clinical trials, and so you have to defer to those that are ongoing at the time, whether they're antiviral or not.

But for the patients who don't meet criteria for that, hopefully we can get them in another clinical trial. Dr. Chatham and I have a fair amount of experience with IL-1 blockade using recombinant human interleukin-1 receptor antagonist or anakinra, and so that would kind of be our bias.

But we don't know for this virus if IL-1 is going to be central, my guess is it probably will be. And there's other reasons specifically to like that agent, it's a recombinant human protein, so that's a good start. It's got a lot of safety data from its trials in RA, where it turned out not to be the greatest strike for rheumatoid arthritis, but we have a lot of pretty favorable safety data with that. It's got a short half-life of about 4 to 6 hours, and so even if it was causing harm, it's gone if you need to get it off. And it tends to work fast, and it's got a very big therapeutic window, including a lot of safety in that window. It's worked for even sepsis patients when you retrospectively, go back and look at sepsis trials and bring out the patients who have features of cytokine storm amongst those sepsis patients, it helped their survival.

So there's a lot of good reasons that that particular drug, if it turns out to work, would be something to consider.

WC: Yeah, I think most of the reported experience thus far in terms of whether these therapies are effective come out of China with their use of tocilizumab. I think that was chosen as the intervention when the Chinese physicians suspected that this was going on, because they noted that some of those patients had elevated IL-6 levels. Plus, I think that's the main intervention that they had access to.

I'm not sure there's access to IL-1 inhibitors in China. At least, there wasn't as of two years ago, the last time I was there and I'd spoken on this topic with them about just the cytokine storm syndrome in general.

So tocilizumab may be effective. Whether it's as effective and safe as IL-1 blockade, Hopefully some of these trials that are resulting out of Italy will let us know in the not too distant future.

ES: Thank you. I think we all agree that you should enter patients into trials because we have to know, and I think the point you made, whether it is pure antiviral, antiviral with or without a cytokine blockade, and we really don't know which one, I think that's an encouragement.

So on that note, is there any final messages you'd like to leave with our listeners?

RC: Just I'll just get my one, my one liner that I've been pushing for awhile, and that is: we have to treat not only the virus and we don't even know if we have effective therapy, hopefully we end up having something that proves useful, but we have to treat the patient's immune response to the virus if that's what's harming the patient.

WC: I would concur with that. I think the point of emphasis is, is to think about this early when these patients are admitted.

If there's an option to get them into a trial where we can answer some of these questions with these interventions, that's great, but if the patient doesn't have access to that option where you are, and the patient is clearly continuing to deteriorate with these markers, then I think offering this option whether it's with IL-1 blockade or IL-6 blockade is certainly something that should be strongly considered.

Because, again, we all want these patients to survive, but we also want them to survive with some meaningful quality of life, and once you've been on a ventilator for a week or two, even if you get off, that can be suspect.

The goal needs to get these patients stabilized, get their disease under better control, whether it's immunologic and/or virologic, and try to forestall them, having to go on mechanical ventilation.

ES: Thank you.

To me, I learned a lot and I hope our listeners did, and the take home message from my point of view, is early recognition, get on top of it, use the drug you're comfortable with, but, first of all, enter patients into a trial, because we have to get the answer, and hopefully, we will have an answer from Italy and directing it will be better.

So, on that note, I really want to thank you for the time, and I encourage everybody who listen to this to please read the article by Drs. Cron and Chatham as they expand upon these issues and do give a really nice table of different therapies.

And again, it is at jrheum.org.

Thank you and keep healthy.

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