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Edited for more context and nuance (and public sharing on FB) 3/15

By Larken Bunce

What's the deal with elderberry and cytokine storm?

We're all seeing this question and concern making the rounds. Many others have addressed it, so I haven't felt my voice was necessary. But, a number of my students have asked what this was about, so I responded on our VCIH FB group page, not intending it for wide distribution. However, folks have found my words useful and have been sharing it, so I figured I might as well make it easier to find and attribute.

I'll preface my thoughts by highlighting that the author of the original blog post that started this concern (who I'm not tagging because she doesn't need any more flak over this) was simply suggesting we should use critical thinking and specificity and not just throw elderberry at everything/everyone--which has become the pop-herbalism tendency. The response to this reasonable gesture towards nuance has been a volatile mix of anger (from other herbalists) and fear and confusion (from the wider herb-using online population). It doesn't help that we're in an overall fearful and uncertain time. I'm sad for the divisiveness this has caused and the impact on the author. I also see how much work we still have to do to educate the general herb enthusiast about differential selection of plants.

So, here's the summary of my opinion, which is just that--an opinion--since no one has yet worked directly with our current situation. It's based on my clinical experience, understanding of the available scientific literature, and other herbalists' thoughts on the matter. It's not meant to discredit other's opinions or be used as a weapon of Truth in anyone else's arguments. Kindness, please, friends. Kindness.

I believe there is likely to be benefit and unlikely to be harm when elderberry is used in the context of a larger protocol, appropriate to the person and their specific needs in the moment. This may indeed mean NOT using it in \*some\* folks with auto-immune conditions and/or when there is already plenty of pro-inflammatory cytokine activity, as in active, feverish infection. Using this kind of practical, differential thinking is all that the original concern was getting at. Hopefully this is the kind of specificity we all employ as herbalists and can convey to worried friends or clients.

Here's the long form answer for those that want more details:

To my knowledge and that of other herbalists responding to this same concern, there's no evidence clinically or via research that elderberry has ever caused a cytokine storm, which is an uncontrolled inflammatory response which damages tissue--here we mean lung tissue. This is more common in those with strong immunity, e.g. "young, healthy" folks, but not restricted to that population. There is evidence that elderberry extract can increase certain pro-inflammatory cytokines, the same ones involved in cytokine storms. Cytokine storms were a feature of H1N1 influenza and elevated levels of two of these same cytokines (IL-6 and IL-8) were identified in

some folks with severe cases. So, if we're extrapolating theoretically (as the original author of the post that started this concern was doing), we might be concerned, as cytokine storm features in severe cases of COVID-19, too. It's good to be critical and have nuance in our use of herbs, which I believe is all she was advocating for.

But, let's take another look: while cytokine storm *was* a feature of H1N1, at least here in Vermont it was also an instance where a huge amount of elderberry was consumed indiscriminately by a self-treating population. In fact, it gained a lot of popularity around that time because of some well-timed research re: direct antiviral activity. But, to my knowledge none of us practicing identified a relationship between elder and worsening flu symptoms. Could we have missed hearing about it? Of course. But, what we did hear was how much folks felt like elderberry helped them stay well or get better faster than other family members or co-workers, etc. As I mentioned and the article pointed out, research suggests elderberry can indeed upregulate some of these pro-inflammatory messengers and this is part of its value in improving early immune response. But, there's also research suggesting it reduces those same cytokines, acting as an anti-inflammatory. So, it's likely most accurate to say it's a *modulator* of cytokine expression or activity, making it generally safe and helpful *for many*, though not all, folks.

The bottom line is that herbs and humans and our interactions are complex. While using research to ask better questions and be more specific in our use, we also want to look at clinical experience. Again, to my knowledge, no one has seen or suspected this cause and effect relationship (elderberry use = cytokine storm in viral infection) clinically. I personally am using elderberry and thoughtfully recommending it to my family and friends to stay well right now, *\*\*along with other herbs and approaches\*\**. However, if I were to get sick and began to run a fever (sign of more pro-inflammatory cytokines), I would stop elderberry and move towards more appropriate herbs to address fever management--not suppression--like yarrow, elder flower, and peppermint and perhaps work on keeping mucus thin with aromatic herbs like garlic, ginger, horseradish and elecampane. Licorice and Baikal skullcap can be strong anti-inflammatories, along with the other herbs I mentioned. This is NOT meant to be taken as "how to treat COVID-19", I'm just giving you my personal approach for ME, right now. (I'd also call my doc and see if I need to get tested and stay the heck home, which I'm very privileged to be able to do.) The point is that I would use elderberry when it's appropriate and most effective and then shift to other herbs when they are more indicated. Not because I'm worried that elderberry will cause harm, but because other herbs will likely work better at different stages of illness.

Back to the original article raising alarm, the author's original concern was directed at using caution with folks who have auto-immune conditions, which also involve excess inflammation driven by these and other pro-inflammatory cytokines. Many herbalists have not seen worsening of autoimmunity-related inflammation/symptoms with elderberry, but a number of individuals do say they've had this experience and some clinicians have also seen it, including that author. When COVID-19 came on the scene and everyone was going wild for elderberry all over the interwebs, the author shared her old article to make sure folks know that maybe elderberry isn't

for everyone in every situation, esp. not some folks with auto-immune conditions, or when it's time to choose other more specific plants. Then things went, shall we say, viral.

Thanks for reading and I hope this has been useful. Remember that this is the time for collaboration and integration. If there is any suspicion of COVID-19, be sure folks minimize interaction with others as best they can, seek testing, and avail themselves of all appropriate/available medical care! Please don't suggest folks choose herbs over any recommended medical treatment or that taking herbs means folks can be less careful with exposure of themselves or others. While we imagine herbs may have a valuable supportive role to play, \*no one\* knows enough to say anything definitive and we need to stay humble here.