NUTRITION & IMMUNITY PODCAST SERIES

THE ROLE OF HYDRATION IN THE ACUTE INFLAMMATORY PROCESS & RECOVERY

Featuring :: Ainsley Malone, MS, RDN, LD, CNSC, FAND, FASPEN

TRANSCRIPT

Maura: When the Covid-19 pandemic first started to spread here in the United States, my bourbon-drinking friends joked about staving off the disease by drinking a shot of their favorite brand at night. "Gotta drink your fluids!" they'd say. "Alcohol kills germs!" they'd remind me. They'd laugh about it in that nervous, joking way people do when they're not sure what's ahead of them. It's goofy, right? But apparently, the idea was so pervasive, the World Health Organization had to create myth-busting content just to dispel it.

Maura: So, here's a fact: One of the real keys to preventing and addressing Covid-19 and other illnesses is to stay hydrated. The right fluids can play a real role in immunity. They help regulate body temperature and assist the body with eliminating bacteria and other harmful substances. But not just any liquid will do. Water or fluids should have your focus, because they can help your cells maintain the right fluid balance for proper hydration. So, it's easy, right? Just drink your fluids.

Maura: But, what role does hydration play when the situation is dire? When a patient is in acute inflammatory distress, for instance? Or what about when they're on a path to recovery? Our guest, Ainsley Malone (MS, RDN, LD, CNSC, FAND, FASPEN) works with the Nutrition Support Team at Mt Carmel East Hospital in Columbus, Ohio. I'm Maura Bowen, podcasting for Abbott Nutrition Health Institute, and I'm pleased to interview Ainsley again today. She's been a guest on our podcast before, and she's an absolute expert in her field. Ainsley, it's great to welcome you back!

Ainsley: Thank you, Maura.

Maura: So, one thing to note for our listeners: This podcast recording may sound a little different than you're used to hearing. For the sake of social distancing, Ainsley and I are both dialing in for today's discussion rather than sitting in the studio.

Maura: So Ainsley, before we start, can you tell us a little bit about yourself, your current role, and what brought you to this area of focus in your career?

Ainsley: Maura, thank you very much again for having me join you on this podcast today. And just for a little background, I'm a nutrition support dietitian, as Maura said, at Mt Carmel East Hospital in Columbus, Ohio. Were I work with pharmacists and other clinicians in managing enteral and parenteral nutrition in primarily surgical and critically ill patients. This has been my area of practice for over 30 years and is something I truly enjoy, really due to the complex conditions these patients experience and the kinds of decisions required to provide adequate nutrition care.

Maura: So currently, COVID-19 is still categorized as a global pandemic. Each day it is impacting more and more

patients, which has stressed the health care system and our ICUs. Many of these patients are presenting with severe acute respiratory distress and respiratory failure. As a result, providing optimal feeding and hydration to these patients is critical to their outcomes. What are you seeing and hearing about these patients in your current role?

Ainsley: Well, Maura, I think overall the statistics we're seeing across the US have really been holding true as the pandemic continues. And that's really mainly that approximately 10-20% of confirmed Covid-19 patients are requiring hospitalization and of those, about 25% become critically ill and require ICU care. We know that data from China has indicated that about 60-80% of those in the ICU develop respiratory failure requiring ventilator support. Most all of these patients can be and are being supported nutritionally with enteral nutrition, however a small percentage—what I'm seeing in my healthcare setting is about 10-15%--of these patients don't actually tolerate enteral nutrition and require parenteral nutrition.

Maura: For the COVID-19 patients in the ICU, what seems to be the biggest concern for them nutritionally?

Ainsley: Well most Covid-19 patients who require ICU care have developed respiratory failure. And these patients experience a very heightened and often prolonged inflammatory response. And as we well know, this pronounced response results in marked hypercatabolism and profound loss of muscle mass. Providing adequate energy substrate and protein to support this response is crucial to hopefully mitigate the extent of the muscle loss that these patients undoubtedly experience.

Maura: With acute viral illnesses, like COVID-19, what's the effect on hydration status and the immune response?

Ainsley: Well, Maura, as we know, fever is one of the hallmark symptoms with Covid-19 infection. And we all know the impact fever can have on maintaining adequate hydration. For each increase of Fahrenheit temperature, above normal patients can lose on average about 100-200 ml of fluid, and this will certainly vary depending on body weight as well as whether the individual is male or female. And this can have some potential impact on immune response. In a dehydrated state, the lymphatic system doesn't work as efficiently and immune response to an invader is actually slowed. And there is some evidence that lymphocyte proliferation, which is very important in the immune response, can be depressed when an individual is hydrated.

Maura: As we've discussed, we know that COVID-19 impacts respiratory function and in some cases can lead to Acute Respiratory Distress Syndrome, or ARDS, which is a serious complication and can significantly impact their nutritional and hydration needs. Specific to hydration, what does the evidence show regarding fluid restriction in the early phases of ARDS? Are there any associated benefits?

Ainsley: Well, Maura, theoretically, if ARDS patients can be kept dry, improvement in the patient's pulmonary status, including gas exchange, can potentially be of benefit. A large prospective randomized control trial that was conducted in 2006 actually compared conservative and liberal fluid management strategies in 1000 patients with acute lung injury, which is the predecessor to ARDS. These researchers found that those who received fewer fluids had improved oxygenation and greater ventilator-free days. A more recent evaluation in 2017 demonstrated that ARDS patients with a higher cumulative fluid balance on their 7th day had a longer length of ICU stay and fewer ventilator-free days. These results actually do support the use of a conservative fluid management strategy in the patients with ARDS.

Maura: Let's touch on the body's inflammatory response. Can you explain how the inflammatory process impacts physiology and the end results on fluid needs, particularly in our ICU patients?

Ainsley: Well, Maura, during acute inflammatory response, the first phase is characterized by hypovolemia because the primary treatment goal really is to provide adequate profusion to the brain and other essential organs. And this is a time where we're seeing massive fluid resuscitation efforts, and really those are in place to raise blood pressure and promote that adequate profusion.

Ainsley: Due to the increased vascular permeability that we know is a hallmark of the inflammatory response, many of these patients develop severe edema following this resuscitation. And this is certainly a function of the severity of the response and how much fluid is required during this resuscitative period, which is generally the first 24-48 hours.

Maura: For patients with ARDS, if they're being fed either enterally or parenterally, does that impact hydration needs and any need for fluid restriction?

Ainsley: Certainly there may be a need to restrict fluid in patients with ADRS, and there is a potential for outcome benefit. ARDS is actually characterized by a significant influx of fluid into the lung sacs which directly impacts gas exchange and is a hallmark of the severe hypoxemia these patients experience. And what we're seeing is that many of these patients in the ICU with Covid-19 infections are having profound hypoxemic respiratory failure.

Maura: So which patients would be indicated for fluid restriction? For instance, how can clinicians identify the right patients, and what should they be looking for?

Ainsley: Well, Maura, in my mind, there are really several clinical conditions patients may be experiencing that could potentially benefit from fluid restrictions. The patient with acute kidney injury who isn't making much urine—even with renal replacement therapy—could benefit from reduced fluid intake. And also those patients with severe total body edema might benefit from reduced fluids. This is certainly a very good discussion we should have with our medical team to really make decisions in terms of the particular patients fluid needs and response to their nutrition therapy.

Maura: How about when patients don't need fluid restriction, how do we best provide hydration to those patients without overwhelming them or fluid-overloading them?

Ainsley: Well, again, I think having that discussion with the medical team in terms of whether fluid restriction is indicated or not is really the most important first step. If a restriction isn't necessary, then really following general fluid guidelines is a reasonable approach. Simple methods including providing 1 ml per required calorie or even a weight-based approach, for example 25-30 mls per kilo of body weight per day is really a good, reasonable starting point. And from there you can evaluate overall fluid status over time to determine if you need to make adjustments, if you need to switch to something more concentrated or you can liberalize fluid.

Maura: Lastly, what resources—from ASPEN or other expert nutrition organizations—would you recommend to all our healthcare professionals out there caring for patients during this pandemic?

Ainsley: Well, Maura, ASPEN and the Society for Critical Care Medicine have come together to develop key recommendations in caring for Covid-19 patients in the ICU. ASPEN also has developed guidance documents for Covid patients both in the hospital and in the home setting. These are all available on the ASPEN website.

Ainsley: In addition the Academy of Nutrition and Dietetics has a Covid web page with a number of resources that may be beneficial to clinicians.

Ainsley: And then lastly, ESPEN, which is the European Society for Clinical Nutrition and Metabolism, has also provided guidance for the care of Covid-19 ICU patients. And that information is available on the ESPEN website.

Maura: Excellent insights, as usual, Ainsley. Thank you so much. We appreciate all you're doing to help build awareness for the important role nutrition has to play in managing patients with this virus.

Maura: Now, for our listeners, if you're hoping for more podcast episodes on nutrition and immunity, rest assured we're developing a series of additional episodes to help support you—in fact, we have a host of Covid-19 related

episodes already on our website, and we'll create more each week until this virus begins to subside. You can find these recordings on anhi.org by clicking "RESOURCES" then "PODCASTS & VIDEOS." Don't miss an episode: Become an anhi.org member today by clicking "REGISTER" at the top of our homepage to receive regular nutrition science news updates from our team. Or, follow the Abbott Nutrition Health Institute on LinkedIn.

Maura: Finally, our website, anhi.org, has a series of printable resources related to this topic—for instance, infographics on nutrition and immunity, dehydration, and why maintaining muscle matters. You can find these resources on anhi.org by clicking "RESOURCES" and "PRINTABLE MATERIALS."

Maura: Thanks everyone. Stay healthy and safe.