LEUKEMIA & LYMPHOMA SOCIETY®

THE BLOODLINE WITH LLS

A PODCAST FOR PATIENTS AND CAREGIVERS

Episode: 'Tumor Lysis Syndrome: What Patients Need to Know'

Description:

Most blood cancer patients can experience side effects from their cancer diagnosis, or its treatments. In certain blood cancers, an urgent condition called tumor lysis syndrome (TLS) can develop. Dr. Tina Bhatnager of the West Virginia University Cancer Institute joins us in this episode to explain why tumor lysis syndrome occurs and how it is treated. Although considered a medical emergency, Dr. Bhatnagar reviews how prevention and treatment can be successful in the treatment of TLS.

Transcript:

Elissa: Welcome to *The Bloodline with LLS*. I'm Elissa.

Lizette: And I'm Lizette. Thank you so much for joining us on this episode.

Elissa: Today, we will be speaking to Dr. Tina Bhatnagar, an Associate Professor of Medicine and the Director of Hematology and Medical Oncology at West Virginia University Cancer Institute, Wheeling Hospital.

Dr. Bhatnagar specializes in the care of patients with blood cancers, specifically acute leukemias, myelodysplastic syndromes, or MDS, chronic myeloid leukemias or CML, and myeloproliferative neoplasms or MPNs. She has led numerous clinical trials pertaining to these conditions and also served as panelist for the National Comprehensive Cancer Network (NCCN) for both acute lymphoblastic leukemia or ALL and CML. Dr. Bhatnagar is passionate about providing high quality and patient-centric care. Welcome Dr. Bhatnagar.

Tina Bhatnagar, DO: Thank you, Elissa, and thank you so much to The LLS for having me today. I appreciate the invitation.

Elissa: Well, thank you. We're happy to have you here.

So, our topic today is on tumor lysis syndrome. Could you tell our listeners what that is?

Dr. Bhatnagar: Sure, so tumor lysis syndrome is something that we always talk about with every patient who is diagnosed with either acute leukemia or some high-grade lymphomas. And it's a complication of chemotherapy, or it is something that can occur at the outset. Some people can be diagnosed with tumor lysis syndrome as a manifestation of their original cancer diagnosis.

And what it essentially amounts to is a tumor breakdown. As cancer cells are dying off, either spontaneously or in response to chemotherapy, a number of electrolytes, including phosphate and uric acid end up in the bloodstream and can end up precipitating in the kidneys and ultimately causing a lot of organ dysfunction.

Primarily, we see it in the kidneys; but in it's most severe forms, it can cause neurologic issues like seizures or altered mental status, or it can also cause heart rhythm disturbances if left untreated. And so, it is something to be very aware of, and it has to be monitored aggressively because it's very treatable and something that can eventually lead to significant side effects and morbidity if it's left untreated.

Elissa: Oh, wow. So, how does it actually occur, and then when would you normally expect to see it happen after chemotherapy?

Dr. Bhatnagar: It can occur before you even start chemotherapy in people who have leukemias or lymphomas with an especially high disease burden. And so, what ends up happening is that the tumor burden becomes so high, and the metabolism or the activity of the tumor cells is ramped up in such a way that these cells, basically, burst apart.

And when they burst, they release their contents into the bloodstream, so we can see that before people even start any chemotherapy; and we call that spontaneous tumor

lysis. And it can occur also after initiation of chemotherapy as the chemotherapy agents directly target the cancer cells and cause them to break apart, releasing their contents into the bloodstream.

And normally after chemotherapy, we see tumor lysis very soon after, usually as early as sometimes as a few hours afterwards. It can last for as long as a week or two in some cases; but for the majority of patients, it usually lasts on average of 3 to 4 days.

Lizette: Wow. I know that you just mentioned that it occurs in leukemia and lymphoma. Does it occur in other types of blood cancers?

Dr. Bhatnagar: It's really unusual to see it in other types of blood cancers. We don't see it very often in cases like chronic myelogenous leukemia or CML, unless the patient is in a more advanced stage of CML, like blast crisis which for all the world looks like an acute leukemia.

But it's not typical there. It's usually not typically seen in multiple myeloma either or low grade B cell lymphomas. Recently, with the advent of some newer therapies in chronic lymphocytic leukemia, we are seeing drug-induced tumor lysis syndrome as well, particularly with drugs like venetoclax, which is a BCL-2 inhibitor or obinutuzumab, which is another CD20 antibody. But most commonly, we see it in the acute leukemias and the high-grade lymphomas.

Lizette: Are there other factors besides the type of blood cancer that would make a patient more high risk for tumor lysis?

Dr. Bhatnagar: Yeah, if a patient has preexisting kidney dysfunction at baseline, so if they have impaired renal function before, they're even diagnosed with cancer, that might potentially place them at risk. Patients who have an elevated uric acid at baseline are also at increased risk as well as patients who have an increase in this tumor marker called lactic dehydrogenase or LDH. If it's at least three to five times over the upper laboratory limit of normal, that also places them at risk for lysis.

Elissa: Wow. Now, is tumor lysis very common? I had acute myeloid leukemia and don't remember it ever being mentioned when I was in treatment.

Dr. Bhatnagar: Yeah, I mean I will say that it is not terribly common in AML. We see it more commonly in ALL, as well as the high-grade B cell lymphomas. But certainly, people who have a high white blood cell count in association with their AML, somewhere between a white blood cell count between 50,000 and 100,000 on diagnosis indicates a high disease burden and so, those patients could potentially be at increased risk for lysis once they initially start chemotherapy.

But again, depending on the type of cancer, how far it has extended, as well as patient-specific risk factors, the risk can be adjusted based on that. So, in one series of patients who had AML, tumor lysis was reported in about 15 to 18% of those patients. But again, they have those high-risk features at the time of diagnosis.

Elissa: Now, how is it detected? Are there signs and symptoms that a patient can look out for?

Dr. Bhatnagar: For most patients, they actually won't know about it unless it's really far gone. If they are presenting with altered mental status, with seizures, or with arrhythmias or heart rhythm disturbances, that indicates a late sign of tumor lysis syndrome. But the majority of patients are actually asymptomatic.

Elissa: Oh.

Dr. Bhatnagar: And so, we rely extensively on our laboratory tests to determine whether or not somebody is experiencing tumor lysis, and the parameters that we look at are their kidney function, their uric acid, their LDH, their phosphorous, and their calcium. Usually at the outset, when somebody's first diagnosed with a blood cancer and we're concerned that they're going to be at increased risk for tumor lysis syndrome, we monitor those labs every six to eight hours for the first 24 to 48 hours

after they start chemotherapy to assess for laboratory evidence of tumor lysis syndrome because sometimes that's your only cue.

Elissa: Yeah. Would this normally happen during induction therapy versus happening during consolidation at some time when they're maybe in an outpatient clinic?

Dr. Bhatnagar: Yeah, that's a great question, and you're absolutely right. When we do see it, it's at the outset. So, when they're receiving their first round of chemotherapy is when you're going to see it. It is really unusual, and I can't say in my personal practice I've ever seen it happen past the first cycle of chemotherapy.

Lizette: Wow. So, when the tumor lysis syndrome does develop, how does it affect the patient's body?

Dr. Bhatnagar: What ends up happening is the body ends up accumulating these electrolytes that really shouldn't be there, and the ones we worry about the most are uric acid and phosphate. Those particular electrolytes can clog the renal tubules and the vessels and can subsequently cause pretty significant kidney damage, which is what we're trying to avoid. We know that people who develop kidney damage or even end up on dialysis as a result of tumor lysis syndrome have worse outcomes with respect to their disease.

Also, those electrolytes in very high levels can affect the way that your heart rhythm is, and that way it can also put you at risk for having arrhythmias or put the patient at risk for having arrhythmias and heart rhythm disturbances that can potentially be life-threatening.

Elissa: Yeah. Tumor lysis sounds pretty serious. Is it a medical emergency when it's detected, and what were to happen if it were to go untreated?

Dr. Bhatnagar: It is a medical emergency, and I'm glad that you pointed that out because it's something that needs to be closely assessed for patients with acute leukemia and lymphoma, and it's something that needs to be very closely monitored

because it can lead to organ failure. And in the best cases, it can be reversed, but sometimes the damage can be permanent.

So, absolutely, it is an oncologic emergency; and when we are worried that a patient is at risk for having this complication, we try to avoid it by giving them a lot of fluids to help flush the kidneys out and to help flush out those electrolytes. We usually also put them on some type of medication to lower their uric acid, whether it's allopurinol or another medicine called rasburicase. Those are the things that we do to prevent tumor lysis from really becoming a problem.

Lizette: So, it's something that you can prevent. Well, that's good to hear. Now, if somebody does get tumor lysis syndrome, how do you treat it?

Dr. Bhatnagar: Lots of fluids. It depends on the severity. I will say that in most of the clinical studies, as well as my personal experience, I haven't seen very many people with severe, life-threatening tumor lysis syndrome. Now granted, for most of my career, I've worked in larger tertiary care medical centers with a lot of experience handling and taking care of these patients and this particular complication. But the best way to treat it is to prevent it.

Lizette: Sure

Dr. Bhatnagar: Once we start to see it happen, and if it starts to look like it's starting to go out of control a little bit, despite your best aggressive measures, patients do benefit from the initiation of early dialysis, even if it's a temporary intervention.

So, those are the main things that we do to treat it. And then, as the tumor lysis starts to resolve, because it's not something that's going to happen forever, it's going to take place over the next few days, after somebody starts their chemotherapy. Then you should start to see those electrolyte abnormalities correct and the kidney function get better. And like I said, the majority of people that I've cared for have not had a severe degree of this complication.

Elissa: That must be scary for patients if they end up having to go on dialysis while they're on chemo or right after. What do you say to patients to relieve some anxiety there?

Dr. Bhatnagar: I usually tell them at the time of diagnosis, particularly in a patient who I know is at risk for tumor lysis syndrome that this could potentially happen. I had to do it for one particular patient I cared for who had acute lymphoblastic leukemia and really, a very high disease burden at the time that he was diagnosed. He came in with tumor lysis syndrome on presentation with his leukemia; and I was worried that once we started chemotherapy that that was going to get worse.

I preemptively did place a dialysis catheter in that patient, and he did end upon dialysis. But I told him ahead of time that this is very probable as far as something that could happen to you. And so, we do want to cut it off at the pass and make sure that we're not scrambling to get you dialysis if you absolutely need it.

He and his family were not surprised when it happened. It was a temporary thing. He was able to come off dialysis after a few days, and that was sort of the end of the tumor lysis management. He never experienced it since. But I think properly educating patients and their family members about this complication and the worst case scenario. Reassuring them that it doesn't happen very often, but it's a possibility, is something that offers people a lot of relief. And also letting them know that it's treatable. You have a way to fix it.

Lizette: Right. And do patients come off their treatment for their cancer while you're treating them for tumor lysis syndrome?

Dr. Bhatnagar: They do not. They continue as planned.

Lizette: And are there any long-term effects that the patient might have?

Dr. Bhatnagar: If tumor lysis syndrome is caught early and prevented and managed aggressively early on, no. They do just fine in the long term. I have yet to take care

of anybody who has remained on permanent dialysis as a result of tumor lysis syndrome. And I've never taken care of anybody who has residual long-lasting heart problems or neurologic deficits from tumor lysis syndrome. So, the short answer to your question is no.

Lizette: Well, that's really good to hear. And it's really good to hear that institutions are being very proactive in regards to tumor lysis syndrome. Like you said, the best way to treat it is to prevent it.

Dr. Bhatnagar: Exactly.

Lizette: And thank you for letting us know that it is something to watch out for. I really agree when you say that as long as people know about it, then you can prepare a patient if it happens. And just to know that it's more of a short-term issue, right?

Dr. Bhatnagar: Absolutely. I think the transient nature of it does make it easier to explain to patients and something that they find easy to accept. I've never taken care of a patient who I counseled on tumor lysis syndrome who ever felt blindsided or somehow misinformed about this complication. And it's generally not something that comes up on subsequent visits after they've gotten past that phase and are at the next stage in their treatment.

Elissa: Have you ever had it be a surprise with somebody that maybe didn't have any risk factors besides the type of blood cancer that they had? And then it just come up?

Dr. Bhatnagar: I really haven't, because I do think that we have very good ways to predict whether or not somebody is going to get it or not.

There are some medications that we currently use that are known to precipitate tumor lysis syndrome. The one I mentioned earlier is venetoclax, which is a BCL-2 inhibitor that's used in a lot of different hematologic malignancies, including AML and chronic lymphocytic leukemia; and that medication, by virtue of being what it is, puts people at risk for tumor lysis syndrome. And there are very well-defined monitoring parameters

for that, as well as the fact that that medication is not started at the target dose when people initiate treatment. They have to actually escalate to that dose over a period of three days in order to be monitored for this complication.

Understanding which medications are capable of doing this, understanding the disease burden of the patient, their underlying diagnosis, and their risk factors as a clinician does help you piece together how likely they are to experience this complication.

In my own practice, I've never been completely surprised by people experiencing tumor lysis syndrome. I will say I've been surprised the other way, where there were people who I expected to have the complication, but they did not.

Elissa: That's always good.

Dr. Bhatnagar: Yes, that's a good surprise, yes.

Elissa: Now our final question today, on our patient podcast homepage, we have a quote that says, "After diagnosis comes hope." What would you say to patients and their families to give them hope if they do develop tumor lysis syndrome?

Dr. Bhatnagar: I would definitely tell them that it is an expected complication of the treatment that they're receiving or that it's related to their cancer itself. It's a transient thing, so it's not something that we expect to deal with for a very long period of time. And it's not something that we expect to manage recurrently either. It's not something that's going to always been an issue for the patient. I think that's something that can reassure them. I would also let them know that it's not something that usually creates any long-term consequences, assuming that it is prevented and monitored aggressively upfront as the patient is getting their treatment.

Hopefully, those words of encouragement would reassure patients and family members that this is something that is really very manageable in the overwhelming majority of people.

Elissa: Yes, definitely.

Well thank you so much, Dr. Bhatnagar for joining us today and telling us all about tumor lysis syndrome. So, I hope that patients listening, that have either gone through that or maybe are about to start first chemotherapy, are a little more educated today. Thank you, again, so very much for being here with us.

Dr. Bhatnagar: Thank you so much. I appreciate the invitation, and I think it's terrific that The LLS is bringing attention to this particular issue because, as you mentioned, it's an emergency; and sometimes it can be glossed over or, as you mentioned, Elissa, you were not aware of it as you were going through your own treatment. And so, I really want to laud The LLS for bring patient awareness to this very important and very treatable condition.

Elissa: Thank you.

And thank you to everyone listening today. *The Bloodline with LLS* is one part of the mission of The Leukemia & Lymphoma Society to improve the quality of lives of patients and their families.

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