

THE BLOODLINE WITH LLS

A PODCAST FOR PATIENTS AND CAREGIVERS

Episode: 'Acute Myeloid Leukemia: Diagnosis & Prognosis'

Description:

Join Alicia and Lizette as they speak with Dr. Martha Arellano, Associate Professor of Hematology and Oncology and Program Director of the Hematology and Medical Oncology Fellowship Program at the Winship Cancer Institute of Emory University in Atlanta, Georgia. On this episode, Dr. Arellano defines acute myeloid leukemia (AML) and how it is diagnosed. She addresses questions about cause and prevention and how treatment is determined for younger vs older patients. Dr. Arellano also explains the importance of a patient getting a second opinion to not only increase their education about diagnosis and treatment options but also as a way to move forward with a team they trust.

Transcript:

Alicia: Welcome to The Bloodline with LLS. I am Alicia.

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

Alicia: Today, we will be speaking with Dr. Martha Arellano, Associate Professor of Hematology and Oncology and Program Director of the Hematology and Medical Oncology Fellowship Program at the Winship Cancer Institute of Emory University in Atlanta, Georgia. Thanks so much for joining us Dr. Arellano.

Dr. Arellano: Yes hi! Thank you so much for having me.

Alicia: Of course. So, before we jump in to the topic of AML, what brought you to the field of medicine, specifically hematology and oncology?

Dr. Arellano: And so that's sort of an odd story. When I was an internal medicine resident, I was interested in going into infectious diseases so I spent a lot of time on the infectious disease services in the hospital here. And at that time, I asked my program director for a hematology rotation so that I could learn the basics of taking care of patients with HIV and other infections where blood cell abnormalities, such as

anemia, are pretty common. I like to take care of my patients in sort of a holistic way, so I wanted to get the tools that would allow me to do that. So, my program director initially said, “you don’t need to learn any hematology, you will just learn that on the job”, but I insisted and finally convinced them to allow me to have two weeks of a hematology rotation in the hospital. And so, during the first day of my rotation, I was consulted, actually by one of my colleagues, I think I was a second-year resident. He said, “my attending wants you to see this 80-year-old man with low blood counts.” And he was in the hospital for a blood stream infection and so I thought, well, you know, that’s kind of silly because if you have a severe blood stream infection, abnormal blood counts are pretty common in that setting. But being a good resident, I decided I would go in and evaluate the patient; and I made, a peripheral smear of his blood. So, I am dating myself because, we don’t do that anymore manually. So, low and behold, when I took this slide and, actually, it happened to be the current Program Director of the Hematology and Oncology Fellowship at Emory and his colleague that were my attending so I am not sure why I had two attendings on that day. They were both sitting there at the microscope waiting for me to arrive with this peripheral smear; and so I started looking at these cells and one them said, “so what do you see, Martha?” And I said, “well, I see all these funny looking, but they are kind of pretty—they have a lot of granules” and I described what I was looking at. And so, the program director said, “so, what do you think we are looking at? what does this look like?” And I said, “is this acute promyelocytic leukemia?” And he said, “yes, it is”. And, I was just like, “oh my gosh”, I looked at somebody’s blood and I know what they have based on that. I usually have to order a lot of tests to figure out what’s wrong with somebody.

Dr. Arellano: And so, that day, that was an epiphany and I said, “this is what I want to do for the rest of my life. This is it!”

Alicia: Wow!

Dr. Arellano: And so, yeah. So, it is kind of crazy because it was toward the end of my residency when other people already have fellowships and I have—I had gone through some sort of infectious disease interviews, but I was drawn to a specialty where you can use your clinical skills to examine a patient. You can look at their blood and you can come up with a diagnosis with very little use of technology back then. We have newer technology now at the molecular level, but to me, that was just so interesting. And then, the other side of it is that I found that hematology patients are

some of the nicest patients that you could meet and I felt like I could really make a difference for them. And so, after that, I spent the next few months trying to convince the Hematology Fellowship Program Director to take a chance on me. Initially he said, “we have offered all our spots”, and usually people don’t decline fellowship spots, but then he called me and said, you know, “we decided to go ahead and take you anyway.” And, I’ve never hoped to do anything else. You know, I have never gone back on that decision. I think it was the best decision I’ve ever made.

Alicia: Wow. That’s an awesome story. It is always interesting hearing the doctors, you know, say what it was that really propelled them into their, career. There was one doctor who said he was going to be—he was going to be a—what was he going to be, was he going to be like an astrophysicist?

Lizette: Astronaut.

Alicia: Yeah, he was going to be an astronaut. Another one was going to be a vet. Another one was going to be an art director. It’s crazy the different stories that kind—the thing that happened that caused them to shift their focus.

Dr. Arellano: Yeah; yeah; exactly.

Alicia: Well, here at LLS, we are dedicated to creating a world without blood cancers and, on today’s episode, we will be speaking about one of those blood cancers, which is AML, acute myeloid leukemia, which is a series of mutations in the DNA of the myeloid stem cell. So, for those listening, Dr. Arellano, how does AML develop for an AML patient?

Dr. Arellano: Yeah; so, AML is, you know, obviously a cancer of the blood and it starts in the bone marrow. The parent cells in the bone marrow, or what we call the bone marrow stem cells, they are invisible to the eye even under the microscope. We think that a few of those cells, —so a few of those cells can produce all the blood in the body. , normal white blood cells, their job is to fight infection; red cells deliver oxygen to the organs; and a protein called hemoglobin that provides energy; and platelets are the particles that help clot the blood and stop bleeding when it happens. So, leukemia starts in the bone marrow, which is considered the blood factory. We think that the bone marrow stem cells acquire mutations over time and when the body can’t get rid

of those cells that are damaged because of these mutations in their DNA, these cells start to grow out of control and eventually they can overcrowd the bone marrow and spill into the blood. So, we think that's how leukemia, AML, starts.

Dr. Arellano: and so those abnormal cells, they are called leukemia blasts; and they can be seen in the blood as well. So, at the same time that the leukemia blasts overcrowd the marrow, they also cause a sort of bone marrow failure, where the bone marrow is not making enough of the good cells. It is making too many of the bad cells, not enough of the good cells. There is another disease that's related, MDS, or myelodysplastic syndrome, and, patients with MDS have some of the same process as AML, but when the blasts reach a certain level, by definition, that's called AML. And, right now, the definition of AML is when the leukemia blasts, either in the blood or the marrow, reaches 20% or more.

Lizette: A lot of people really ask, you know, how can AML be prevented, and I know you said that mutations form. There is really no way that we can prevent AML at this point, is there?

Dr. Arellano: No. Unfortunately, there is no preventative measures or treatments for this. So, I just tell patients, you know, we try to avoid things that we know are carcinogens or that could produce those mutations in the DNA of our stem cells, but, yeah, as of now, there is no way to prevent it.

Lizette: And it is nothing that we did, like, wrong or the person did wrong. A lot of people...

Dr. Arellano: No.

Lizette: ... feel that they did something and that's what caused it and, really, we find that it can happen to just about anyone; that mutations usually do happen.

Dr. Arellano: Exactly; and that's what I tell my patients. That's one of the first questions that I get when I see a new patient with AML is, you know, was there something I did and there really isn't anything. There is a type of AML that can result after—there's a minority of patients, for whom we can pinpoint a reason or we can come close to pinpointing a reason and that is patients who have had exposures to known carcinogens. About 5 to 10% of patients with AML, we say that it arose

because they were exposed to either chemotherapy or radiation therapy for the treatment of another cancer and that's called therapy-related AML. So the other things that may be associated are Agent Orange, benzene and things like that, but you know, it is not anything the patients with breast cancer or prostate cancer, who have had other chemo or radiation, and they go back and they say, "well, I shouldn't have taken those treatments", but I tell them, you know, at the time, that cancer was a deadly cancer and so if you hadn't had that treatment, you know, you would have had it all those years. So, it's, you know, it's an unfortunate...

Alicia: Right.

Dr. Arellano: ...thing that happens.

Alicia: So, when someone comes into a doctor's office and is then later referred to a specialist because it's highly likely that they may have leukemia, what are a few of the signs and symptoms of that patient?

Dr. Arellano: So, symptoms are things that the patient will feel and signs are things that the patient or family members will see; and those are due to the blood count abnormalities. And so, because leukemia crowds out the bone marrow and prevents it from making good, healthy cells, the symptoms pertain to that abnormality. So, people may come in with an infection that won't clear because the white blood cells are too low; or if the white blood cells are high, those aren't the good white blood cells, those are leukemia blasts, that are considered white blood cells, but they are cancerous cells, and then bleeding. When the platelets reach to levels that are critical, the person will start having easy bruising or bleeding. So, that is a common presentation of these patients. And then the most common is actually fatigue and shortness of breath, and that's because of the anemia. So, when the hemoglobin count is so low, people get really tired and even, your mentation can slow down. It is like everything slows down because your body is not getting enough oxygen to the organs. So, those are the most common presentations. There are some cases where there are no symptoms and just someone went to the doctor or for a procedure and had a blood count and, low and behold, it's very abnormal. And that's less common for patients with AML. You see more of that in patients with chronic leukemias.

Alicia: What tests are usually performed to confirm the diagnosis of AML?

Dr. Arellano: The diagnosis is made by checking a combination of blood and bone marrow tests. So, we generally get some blood counts. We can look at the blood cells under the microscope to get a feeling that's there's something abnormal. Then, we get a bone marrow biopsy and what's called an aspirate, which is drying out some of the liquidy part of the bone marrow. So, we take that to the pathologist, and I actually enjoy looking at these cells under the microscope so they know that I am going to be down there looking at them with them. So, we look at the cells under the microscope to see they look and then, we do further testing. We get what's called a karyotype or a chromosome analysis where the pathologist measures, out these chromosomes so you know, we have, 23 pairs of chromosomes and they are numbered 1 through 22 and the 23rd pair is the sex chromosomes. Females have 2 "x's", males have an "x" and a "y" and so we know what normal chromosomes look like. So, in about half of patients with AML, the chromosomes are abnormal. And some of these abnormalities are actually predictive of the prognosis of the disease. So, some of them predict a better chance of cure with chemotherapy treatment alone and no need for bone marrow or stem cell transplantation. Some of these chromosomes, there is something that we call complex karyotype, where the chromosomes in the leukemia cells have more than 3 abnormalities so they are really abnormal. That karyotype is predictive of a worse prognosis. So we use that information to decide subsequent treatment. The initial treatment is the same for most people except for one specific type of leukemia, that APL that I looked at when I was a resident.

We also look for gene mutations. So, gene mutations are a whole host of genes that can be mutated in these AML blasts and some of those predict a more favorable prognosis and some of those predict a less favorable prognosis. So, we take all this information together, and then we come up with sort of a picture to discuss with the patients. This is what, I think, your prognosis is, based on the data that we have, and then make a treatment plan based on that.

Lizette: And usually for AML, either patients are children or patients are a little bit more advanced in age, right? Not a lot in the middle, but more so at the two ends?

Dr. Arellano: The average age of the patient with AML is older. So, it is actually older than 60 years. There is another leukemia, acute lymphoblastic leukemia, where it has sort of that dual age distribution, where it's the most common in kids and less common in adults. Most cases with AML are in adults.

Lizette: And since they're more advanced in age, I know the treatment is very for lack of a better term, toxic or very aggressive for AML. And a lot of patients may have other comorbidities or other illnesses that they are dealing with. Does that affect the type of treatment that you provide to the patients or how does that go into the decision making of what treatments the patient can get?

Dr. Arellano: Yes; exactly. Exactly the point. And I actually focus on the treatment of these older patients that may be frail or have more comorbid conditions, and so it is more difficult to treat patients of advanced age with AML, because with aging also comes other medical problems like diabetes, heart disease, vascular disease. And so, ultimately, the prognosis of the patient will depend, not just from the leukemia itself, but also on the characteristics of the patient, like age, other medical problems, things that may make it difficult to give very strong chemotherapy.

Lizette: And you mentioned before MDS, myelodysplastic syndromes. Can you just talk about the difference if somebody has MDS and it does go to AML. It doesn't mean that if you have MDS, it will necessarily go into AML, but there is more of a chance of that, correct?

Dr. Arellano: Yes; that is correct. So, AML is a very rare disease. So, fewer than one out of 100,000 people will get AML, but in patients with MDS, that is more common. About 25% of patients with MDS will ultimately develop AML. And MDS, we refer to it sometimes as a pre-leukemia, because it can be a precursor to AML. And the prognosis of what we call de novo AML, which is AML that came out of the blue versus secondary AML, which is AML that followed MDS, the prognosis of de novo AML tends to be better than the secondary AML.

Lizette: And does it have a different treatment at the beginning or are most people provided with the same initial treatment?

Dr. Arellano: That's one of the recent advancements in the treatment of AML is that, before, it used to be what we call induction or a regimen called 7+3 induction. There are some centers that add a third agent called cytarabine to that treatment and it was one size fits all; and now there's a new drug. It's called Vyxeos and it's approved for AML, either with myelodysplasia characteristics or secondary AML, so AML after MDS. And so, the treatment, it used to be the same, but now it's a little bit different.

Ultimately, if a patient had MDS and it progresses to AML, we move toward getting that patient into remission and then stem cell transplantation with the hope of cure.

Lizette: And for those de novo patients, the patients that present with AML, we've heard a lot of patients that may not have a lot of the signs and symptoms, but they go into an emergency room and the emergency room physicians find the blood count is so abnormal. What's the best plan for somebody that goes into an emergency room and is diagnosed, do they have to start treatment right away there, or is there options to go to a cancer center?

Dr. Arellano: That is a very good question. So, I've kind of, I've seen all the permutations and ways that people can present. One would be that you had a cold and you went to your doctor and they see that your counts are abnormal, but they are not terribly abnormal. Your white count is maybe 15,000 and not a hundred thousand. So, if you are not very sick, there is time to have a conversation, and go over the different treatments, and get all your diagnostic material in a non-emergent situation, but if you are in the emergency room, then there would be a reason—usually people that end up in the emergency room are sick. So, those are the people that have either bleeding, or infection, or severe shortness of breath from the anemia so they end up being admitted. I think there's some data that shows that patients that are treated at university centers, they do better than patients that are treated locally, although we have really good partnerships with our community oncologists; and we help them to, you know, figure out who should stay here and who should be transferred.

Alicia: So, for the patients that sit in with you, Dr. Arellano, is there a common question or concern that is brought up multiple times in multiple patients that you think many of our listeners should also be made aware of?

Dr. Arellano: The first question that they ask is what is my prognosis? Am I going to live? And so, and the next question is, what is the best treatment for me? And I think it really depends. I think in the patient that is perfectly healthy, not just young, I'm not an ageist, you know. I don't make decisions based on age alone, although I do, in my very lovely 90-year-old, she said, "look, doc, I don't want to live to be a hundred so you just need to keep me out of trouble for as long as you can. I definitely don't want to be in the hospital for the remainder of my life." So, you know I think it is important to discuss the prognosis and the goals of treatment. Are we going for a cure here or because if we are, then I am willing to take more chance and I'm willing to spend

more time in the hospital away from my family, or are we going for what we call palliation where we are going to do, maybe less? We are going to try to control the symptoms and maybe control the leukemia for a period of time, but we know that quality of life is going to be more important than a cure.

Alicia: Right; and you bring up a great point and that is something we always try to emphasize as well with patients and caregivers, is the importance of communication. You spoke about that 90-year-old who, you know, openly said to you, "listen, my goal is not to be alive until 100." We try to encourage our patients and our caregivers to understand that once they are in that room with their doctor, there are two experts. It's the doctor and then there's them, who actually know exactly how they are feeling, exactly what they want so....

Dr. Arellano: Yeah; yeah.

Alicia: ...we can't stress enough how important it is for people to communicate with their doctors and and feel comfortable to do so. And if not, seek a second opinion or seek another doctor.

Dr. Arellano: Exactly; and that's another thing that, you know, I've had patients that say, "hey, I love you so much, but I want to get another opinion because you just gave me some really bad news."

Alicia: Mmm!

Dr. Arellano: And so, you know, "but I don't want to hurt your feelings." I tell them it's not about me, you know, it's about you and you need to be certain that you've explored all the options and that, you can make an informed decision about your own life and about your own care. So, I absolutely do not take it personally when people want to go and get a second opinion.

Lizette: But I think it is important to highlight what you are saying, Doctor, which is twofold. really, having the conversation with the patient and making it an active treatment decision, meaning that both parties are taking part in making their treatment decision. , I think that's very important and to know the goal because acute leukemias usually there's a potential for cure whereas chronic leukemias, usually we say is a chronic disease, tends to come back, tends to be chronic so, really the goal is

not cure, but the goal is to maintain a good quality of life in a good remission period, and keep getting, you know, good remission periods, but with acute leukemia, it's true what you are saying where you can actually have that treatment goal to have a cure or, you know, you can choose to have a good quality of life which may potentially be a different treatment, that potentially has less side effects so you are feeling...

Dr. Arellano: Correct.

Lizette: ...better to do more things. So, I think that's really important for AML patients to know that there is that choice that I don't think a lot of people really, think about because they think, okay, acute leukemia, your goal is cure.

Dr. Arellano: Yeah; I have seen a lot of patients that tell me I didn't realize there were options. I just thought it was one, you know, but definitely not every patient is a candidate for an intensive induction and that's where, those conversations are even more important, that people know what they are getting into.

Lizette: at The Leukemia and Lymphoma Society, we always advocate for second opinions and all our key opinion leaders, like you, say, you know, get a second opinion; it's okay. And people are so scared to get that second opinion, but us, the same people, you know, will, go around to 25 car dealerships trying to look for the best deal for the best car...

Dr. Arellano: That's true.

Lizette: ... but, you know, this is our healthcare so I think we have to, I guess, learn that it's okay to go to others just to get a different opinion just to see what's out there, because there are so many things happening in the field now that it is to your advantage to get another opinion just to see, you know, what doctors are learning out there, especially when there is so much innovative research now going on with AML.

Dr. Arellano: Yeah; absolutely.

Alicia: Thank you so much, Dr. Arellano, for speaking with us about AML and for all that you do for your patients.

Dr. Arellano: Well, thank you so much for having me. It was a pleasure.