Eye on Diabetes: 5 Ways Your Vision May Be Affected Transcript

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Introduction to Diabetes and Eye Health

Diabetes is essentially elevated blood sugar in your blood vessels. And with hypertension, the higher flow through the blood vessels further damages the blood vessels.

And three, when there's increased lipid, it makes essentially blood more dirty. Think of it that way. And by reducing the sugar, by reducing the lipid, and by reducing the flow and damaging the blood vessels, it really reduces the complications diabetes has.

So that's the triad of how to minimize complications. This is Doctor Talks, real talk from real doctors on the issues that matter to you most. This episode was recorded during the Eye Health Summit where the world's leading experts shared breakthrough insights in vision and holistic eye care.

Hello and welcome back. I'm Dr. Rani Banek and today I'm joined by Dr. Krishna Mukamala, who is a highly experienced retina specialist who has devoted his practice to helping people with diabetes restore and preserve their precious eyesight.

Thank you so much, Dr. Mukamala, for joining us today. Thank you for having me, Dr. Banik. Yeah, absolutely. So let's get right into it. With diabetes, we know that as an eye doctor, we know that it can cause so many different issues in the back of the eye.

But why did this particular area of care interest you so much? Many times we feel like an eye is a different organ than the rest of the body because it's in many ways not a typical part of much of your routine care at your primary care doctor.

And the truth of the matter is in the eye, the retina specifically is integrally related to the rest of the body. The reason is because the blood vessels that feed the eye and specifically the retina travel through the rest of the body and medicines you take as well as conditions that you have in your body can damage the retina.

Why the Retina Is Affected by Diabetes

And so that integration between the retina and the rest of the body makes this a very interesting topic. I understand. So for our listeners who maybe they have diabetes or they've been diagnosed with pre-diabetes or they have a loved one with diabetes, which is so common, just give us the overview.

What are the five main ways that diabetes can affect our vision? There are probably a lot more than that, but let's talk from a retina perspective. What are the five main ways that diabetes can affect vision that you've seen?

Sure, I think the first and most commonly heard word is cataract. So many times patients who have diabetes can develop cataracts at a slightly younger age.

The second is that they're more prone to what's called diabetic retinopathy. And that's a condition where there could be bleeding in the retina or in the vitreous cavity.

Furthermore, the damage done by the elevated blood sugar in the blood vessels can cause some of the retinal tissues to be swollen up. We call that macular edema.

Furthermore, you can develop various types of glaucoma. So there are many eye conditions for which being a diabetic puts you at greater risk, including even a stroke to different parts of the eye.

Let's talk a little bit more about diabetic retinopathy. So there are different forms of the condition, right? Different

stages of the disease. Can you share with us what are those different types and how do we approach each of those types?

Sure. Whenever a patient enters my office for a diabetic evaluation, I tell my staff that there's a matrix. It's a very simple box that's two by two. And the first question to answer is, do they have diabetic retinopathy or not?

If the answer is no, it's simple. Continue to manage your A1C, the goal of which is 7.0 or below and move on with your life. But if you have diabetic retinopathy, which is evidenced by little spots of blood in the retina called microaneurysms, the next question becomes, is this non-proliferative or proliferative diabetic retinopathy?

The reason why that question is so important is because proliferative diabetic retinopathy or the more serious version can cause significant vision loss, either by forming scar tissue and detaching the retina or by causing hemorrhage, which causes patients difficulty seeing through that blood in their eye.

Main Eye Complications of Diabetes

So that's the first question. And the second question, is there or is there not presence of diabetic macular edema? Diabetic macular edema, to break that down, means that in the center part of your retina, called the macula, and to explain that word, I call it the downtown of the retina.

Just as Atlanta, where I reside, in the very center, has a downtown, and we have a very large suburbs, the reality is the downtown has a very high density of population, and in the same way, the macula has a high density of photoreceptor cells.

And in that area, the blood vessels can leak and the water in the blood vessels can leak into the surrounding tissues, making it more difficult to see.

And if you have proliferative diabetic retinopathy or if you have macular edema, Those generally require treatment and that's why identifying those is critical to making a treatment course.

That's excellent information. I know oftentimes people will go to the eye doctor for their annual checkups. Is it any different for diabetics? For example, the frequency of how soon they should be seen or let's say someone's been just diagnosed with diabetes, it's a new diagnosis.

When do they need to be seen by an ophthalmologist? That's a great question and what I would say is that any diabetic should be examined at the minimum annually, either their optometrist or their ophthalmologist.

I think it's mandatory and that's why many times the primary care doctor recommends that so that way their eye gets a good checkup. There are many things that we look at in that kind of exam.

Number one is that we'll look at the vision in the glasses and the eye pressure. Those are standard and basic things. But in addition to that, it would be very important that your eye care provider looks specifically at your retina because that's the major area that can be affected by diabetes.

And that exam might include one of three things. One would be a dilated eye exam. That's where they place eye drops in your eye so that way they can look deep into your retina.

Number two, it might include fundus photography, which is a photo taken of your retina to look for some of the subtle findings that may not be as easily visible by just looking in.

And the third is an OCT. Think of it much like a microscope. A microscope, you can see some large items, but looking through a microscope, you can see fine detail.

And an OCT is a non-invasive device that looks specifically at the macula to look for any macular edema. So those would be three standard tests that might be considered.

And if you don't have diabetic retinopathy, I think it's quite typical to be examined once a year. But based on the level of diabetic retinopathy, your eye care provider may recommend more frequent visits.

Diabetic Retinopathy Stages and Macular Edema

And a few small caveats to that might be if you're pregnant, because pregnancy can cause changes in your blood sugar with changes in hormones. And so your doctor might recommend more frequent examinations.

Got it. Thank you for that information. Now, is there a difference between having someone having type 1 diabetes in which perhaps they're not making enough insulin and they have to be on insulin or some derivative of insulin and type 2 diabetes where their body makes insulin, but perhaps their cells are not able to take in the glucose.

We call that insulin resistance. Is there a difference between when these patients should be seen a type 1 diabetic versus a type 2 diabetic? That's a great question.

And I would say the answer, generally speaking, is no, in the sense that in both cases, the net effect is that the elevated level of blood sugar can damage the blood vessels.

And this is an example that I give that I think many patients understand very clearly. Let's say you took the PVC pipe that you might have for plumbing in your home.

and you poured acid in it, you would expect that acid would corrode the blood vessels. I think everybody would have the same answer. And I tell patients that's exactly what diabetes does.

In diabetes, what happens is that due to lack of insulin or due to insensitivity of the tissues to insulin, there's an elevated amount of blood sugar that's running through the blood vessels.

And that blood sugar, in effect, damages the blood vessels, causing those blood vessels to become weak, much like pouring acid down a pipe. And a few observations I will make, however, is that, unfortunately, type 1 diabetics, individuals who don't produce insulin, become diabetic at a relatively young age, and for that reason, end up with diabetic complications also at a younger age.

And I think it's very critical for them because when you're younger, you have so many other responsibilities. You have work. You have so many other types of physicians that you see, so it becomes increasingly difficult to fit an eye doctor into your schedule.

But it's all the more important because you have a lifelong vision to preserve in terms of the retina, and we want to make sure that these individuals are well cared for.

And oftentimes, as a type 1 diabetic, you might be diagnosed anywhere in your first to second decade, and you might see complications as soon as 10 years after that if the sugar is not well controlled.

In type 2 diabetics, we oftentimes see it within roughly 5 to 7 years after being diagnosed, particularly if it's not well controlled. And that control, you mentioned having a hemoglobin of less than seven is ideal.

Do you have any more specific guidance? Like, for example, should type one diabetics strive to have, because they have diabetes for a longer period of their life, should they have stricter control?

Does it really matter? That's a great question. Generally speaking, among our retina colleagues, I don't know if there is any other advice beyond keeping the A1C7 or below because the thought process is that A1C and NA1C for your listeners basically is an average of your blood sugars over the last three months.

Eye Screening and Exam Frequency

And the goal A1C for a diabetic, whether type one or type two is roughly seven. Now there may be individual

parameters based on other conditions that patients has that the endocrinologist or the diabetes provider would give.

But an A1C or 7 is thought to reduce the likelihood of end organ damage. And many times I have a difficult conversation with my patients because in spite of controlling their A1C at 7 or below, the eye condition doesn't reverse.

So they wonder, they come to me with an elevated A1C, I initiate treatment, they do their part, but the retinal condition may not always improve to their satisfaction.

And I tell them that many times if it's been poorly controlled or if you've been diabetic for a very long time, you still have to deal with those retinal issues even though the patient's doing their part.

And that's why I think it's important to start early in terms of eye examinations. The earlier you start, the milder the complications will be and the easier they will be to treat and reverse.

And I give them the example of a cliff. As you walk towards the edge of the cliff, the moment you fall off the cliff, it's hard to bring you back up. And our goal is to find you a hundred feet away from the cliff so you never even get close.

And that's the benefit of going through preventative eye examinations early in the journey. So I wanted to just bring up, there was a large study done years ago called the Diabetes Control and Complications Trial.

And in that trial, some patients had very elevated A1Cs and they got their A1Cs down very quickly. And actually their diabetic retinopathy worsened. So what you're saying is people get frustrated because they may have a high A1C, they get it down, but their eye issues don't immediately respond.

Do you have any thoughts about why that may happen? That's a great question, and I'm going to add one additional level of complexity to your discussion that applies in our modern day.

You may be aware that many of our patients in the recent last five years have been taking what are called GLP-1 agonists, and these are medicines branded names such as Ozempic and McGovey, who have been tremendously effective at reducing blood sugar levels as well as helping patients lose weight.

And we see the exact same phenomenon in these individuals. And in fact, if you look at the labels from any of these medicines, which are typically in the form of injections, they say may worsen your eyesight or your retinal disease.

And many times I think what happens is that the body has a tremendous way of auto-regulating.

Type 1 vs Type 2 Diabetes and A1C Goals

Auto-regulating essentially means that the body's blood vessels and the different tissues Become accustomed to a certain level of life think of it where for example Let's say you're used to making a million dollars a year Whatever that number is and then all of a sudden your income drops by 50 or a hundred percent You have a very difficult time adjusting to that and in the same way even though the blood sugar levels elevated the body has auto-regulated in a way that adjusts to that and And when there's a significant reduction, even though that's generally a good thing for the overall body, it has a difficult time coping and then resetting its level.

Now, what I tell patients in this situation is that even though yes we see increased diabetic retinopathy in the transient phase or the intermittent time period after which your sugar has dropped.

It's still an important thing to do and the reason is because we have very good treatments for diabetic retinopathy and macular edema and these typically include injections into the white part of your eye called intravitreal injections.

You may see many advertisements for different brands on tv and we have lasers that can be performed in surgery. Now The goal is to control the majority of disease in the office with either injections or laser and to avoid surgery, but that option also exists.

Having said that, I personally as a retina specialist don't have any treatments to save your brain from a stroke, your heart from a heart attack or your kidneys from dialysis.

And I think that's one of the key things about reducing the A1C is that there's many organs to control besides the eye. And that's why I'm okay with patients taking this class of medications as long as they follow up with me to monitor their eyes.

Thank you for sharing that because I know so many people out there may be on these drugs or even compounded drugs or various other forms of the drugs.

It's very common in our population these days. So let's say somebody, you know, is on a new one of these GLP-1 inhibitors, their hemoglobin A1C was 11 and then very quickly it comes down, let's say, to 8 and they experience a worsening of their vision changes.

How long can it take before things normalize and the auto-regulation kicks back in? Is there a time frame that usually gives patients, like it may get worse and then eventually it'll stabilize?

That's a great question. Interestingly enough, at the American Academy of Ophthalmology meeting this past fall in Chicago, this exact topic was discussed at many of the research meetings and I don't think there's enough data to know that yet.

The main thing is that If you have, if you take 1 of these medications, and if you notice a change in your vision, I think you should be examined immediately.

And my approach as a retina specialist, and this may not apply to all my colleagues is that I set a mental threshold. For example, on a scale of 1 to 10. If they have diabetic macular edema between zero and three, I may be okay observing that as long as their vision is quite good, such as 2025 or 2030. But when the amount of macular edema is higher than that threshold, let's say four or greater out of 10, or the vision reduces to 2040 or worse, I may initiate treatment even if they're in that temporary phase.

And so that's how I approach that issue. Okay, so earlier intervention can help to preserve eyesight. That's what you're saying. Yeah, absolutely. And furthermore, starting treatment, such as injections does not necessarily mean you need it for the long term.

What I tell patients is that the starting it at the appropriate time. allows you to preserve the most amount of vision and need the least amount of treatment in the long term.

So those are the two things I tell my patients I try to optimize. Number one is maximizing your visual outcome.

Rapid Sugar Reduction and Retinopathy Changes

And two is minimizing the total number of treatments you'll need. And that can be achieved by early intervention. Dr. Makamala, you are a wealth of information about diabetes and vision health.

We're going to take a very short break here from one of our sponsors, and we'll be back. Discover Nourish, the core of Ageless by Dr. Rani. It's more than a multivitamin.

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Nourish, elevate your life with eyes that see the world anew. Welcome back. Today I'm speaking with Dr. Krishna Mukamala, who's a retina specialist and diabetes expert.

Dr. Mukamala, we've talked about the various ways in which diabetes can affect our eyes. Now let's turn a little bit to preventative strategies. We talked about having an A1C, hemoglobin A1C, that's less than seven.

That's an ideal range. But what are some other things people can do to help to avoid some of these diabetic eye complications? So I think from an individual health standpoint, in addition to diabetes, it's also important that blood pressure and cholesterol is managed.

That would be what I would say for the most part, the triad of minimizing the negative implications of diabetes. The reason is because, and this is the example that I give that might make a lot of sense to your listeners, is that diabetes is essentially elevated blood sugar in your blood vessels.

And with hypertension, the Higher flow through the blood vessels further damages the blood vessels. And three, when there's increased lipid, it makes essentially blood more dirty.

Think of it that way. And by reducing the sugar, by reducing the lipid, and by reducing the flow and damaging the blood vessels, it really reduces the complications diabetes has.

So that's the triad of how to minimize complications. No, I love that analogy. Think about a pipe and it just gets thicker and thicker. It's more viscous.

And then the end organ, which is the retina in this case, just is not getting enough oxygen. And that's really why a lot of these changes are happening.

Dr. Mukamala, it's an issue with oxygenation. Absolutely. Now, if you think about it, an example that I give to my patients is a tree. When you see a tree in a drought-stricken area, the base of the tree typically is fine.

It's the smallest stems at the very edge or the very top of the tree. Why is that? Because there's not enough water to get to the very top. And that's the same example that applies to the retina.

And in fact, it applies to the brain, the heart and the kidneys because these four organs actually I should say three of those organs are necessary for life the eyes obviously are not but they have the finest blood vessels what we call micro microvasculature and it makes sense the retina is a very small tissue and therefore would have very small blood vessels and the very edge of those blood vessels are the first to be damaged in diabetic retinopathy because the blood which delivers oxygen and nutrients to the very edges of our body can't reach there and those are the tissues that are impacted first.

Preventing Complications with Blood Pressure and Cholesterol Control

Another wonderful analogy Dr. Mukamala that really makes a lot of sense. Now, I wanted to give you a scenario here. Now, I've had this scenario happen with many of my patients where, yes, they know that they're diabetic, perhaps their sugars are not very well controlled, and they seem to be doing fine with their vision.

But all of a sudden, one day they wake up and they have really blurry vision in one eye. They're seeing lots of floaters. They just they can't even see properly what and there's no pain.

There's no other issue. What's happened there? Can you explain why this happens to patients with diabetes

sometimes where they wake up with loss of vision?

Sure. So that's a case where we call it acute painless loss of vision. And typically in that scenario, it means that they have what we call proliferative diabetic retinopathy.

We talked about the matrix earlier about what we look at as retinal specialists. And the first question we ask, It is, does the patient have non-proliferative or proliferative?

And this is the case of proliferative. And proliferation means that the tissues at the very edge of the retina aren't getting sufficient oxygenation as we gave in the previous example.

For that reason, they bed the tissues nearby. They release a chemical called VEGF or vascular endothelial growth factor. And those, that chemical is almost like their cry for help.

and that chemical lands on tissues nearby that do have oxygen. And the goal is to create new blood vessels from healthy tissues to these non-perfused or tissues that don't have good oxygenation.

The problem is that good bridges aren't built in one day, but these vessels are created very quickly to basically satisfy the oxygen demand of these starving tissues.

And because of that, these blood vessels are very fragile and they're very prone to bleeding. And by bleeding, what I mean is that they may break open and the blood in them may fill the vitreous cavity.

The eyeballs call the ball for a reason. It's because in the center, there's a space that's quite large, much like a basketball, that's filled with vitreous jelly.

And when these blood vessels bleed, they fill that vitreous jelly, which is very thick and viscous with blood, and it becomes very difficult to see through it.

So that would be the reason why this patient has suffered this issue. Yeah, and I'm sure you've seen it many countless times as well in your patients.

We call this a vitreous hemorrhage. So if this happens, what can the patient expect? Is this something permanent or this is reversed with time?

Why Diabetic Vision Loss Can Happen Suddenly

So generally speaking, in most patients, this is very easily treatable, right? But easily, there are good treatments that we have. The first thing that we would look in the eye is to, number one, identify the actual underlying cause.

And what I mean is that many of our diabetics who have these type of complications are in the age range of 40 to 60, depending on if they're type one or type two.

So in that same age range, there are other types of conditions that can cause the same set of symptoms, including what's called a PVD or posterior vitreous detachment.

So the first step would be to seek care from an eye health professional and this professional would look in your eye. They might consider sending you to a retinal specialist and the retinal specialist job is to differentiate between the underlying cause between being diabetic retinopathy or a PVD.

Clues they might use include looking at the other eye. So obviously both eyes are tied into our body and they may be somewhat asymmetric but generally have about the same amount of diabetic retinopathy.

And so if there's so much blood in one eye that the patient can't see out and the doctor cannot see in, we would look at the contralateral eye for clues.

On the case that there's not that much blood and we do have good visualization of the retina, we might consider a dye test. It's a test where the retinal doctor's team might place fluorescein, which is a safe dye into your arm.

take photos of your retina. And by doing that type of test, it would reveal the blood vessels that are leaking and kind of guarantee or certified diabetic retinopathy is the underlying cause.

So that's the diagnostic aspect or the first aspect to identifying this patient. The second is the treatment portion. As far as treatment goes, generally speaking, if the vitreous hemorrhage is very mild, observation might be advised.

But if it's moderate to severe, the most common treatment includes injections in the eye. In the same way that I said the peripheral tissues are lacking oxygen and releasing VEGF as a chemical signal, anti-VEGF blocks that to reduce further bleeding from those fragile blood vessels.

The example that I give that patients understand well is like a sinking boat. A sinking boat may have a hole in it. So on one end you have water entering the boat through that small hole and then on the other end you have yourself using a bucket to get rid of water.

And these injections essentially plug the hole. They don't necessarily get rid of the blood, but they plug the hole so additional blood doesn't enter your vitreous cavity.

And then the body over time reabsorbs that blood allowing for clearing a vision.

Treating Vitreous Hemorrhage and Advanced Retinopathy

Now, after one or two of these injections over one to two months, if the blood doesn't clear, we consider it a non-clearing vitreous hemorrhage, at which point a surgery called a vitrectomy may be required to put small instruments into the eye under anesthesia to remove that blood and to clear the blood and to improve the vision.

Ultimately, these injections have been game changers for patients and they've really helped, number one, prevent complications like vitreous hemorrhage and improve these complications when they've occurred.

And there is a trend towards long term treatment with these injections. For example, in the past, if you think of gangrene, many diabetic patients may have heard of the word gangrene where the tip of your finger gets an infection due to poor blood flow and the doctor may have to amputate it by cutting it off.

And in theory, the way it works is by cutting off the tip of your finger, you're able to save your hand and the rest of your body from infection. So in the same way, many times we perform laser and this laser coagulates some of the peripheral retinal tissues, which are generally important for peripheral vision, but not critical for central or the most important part of your vision.

And those blood vessels or the fragile ones that are bleeding are cauterized with laser to prevent them from bleeding and to preserve the majority of your vision.

So that's another approach that can be taken based on our view of the retina. So it seems like you have quite a few tools in your toolkit to manage diabetic retinopathy.

You have the injections, you have the laser, various different types of laser, and then there's the surgery as well. Correct. And it's really important that a patient speak with their doctor about which of these treatments and maybe combination of treatments may be best for their particular case.

I completely agree. And the farther you are away from the cliff, the better. What I have found many times is that, for example, let's say somebody's at the edge of the cliff and you go rush to grab them.

Just your rushing forward may cause them to fall off, right? So in the same way, when an eye is at the very edge of a cliff and about to lose vision, some treatments also have side effects.

And I think that's why it's very important For early intervention, so as to avoid or minimize those type of side effects and the earlier you intervene, the more site that can be saved as well as the less number of treatments that are generally required and hopefully avoiding surgery.

Yeah, those words are gold, Dr. Mukamala. It is so important. I always say an ounce of prevention is worth a pound of cure, and that could not be more true when it comes to vision and diabetes and vision in particular.

Thank you so much for this enlightening discussion about diabetes and the eye and its various complications that may happen. Dr. Mukamala, if anyone wanted to learn more from you, maybe reach out to you or perhaps even become a patient, how could they find you?

First things I would say, one of the blessings of the field of retinal medicine is I think we have fantastic retinal specialists throughout the country.

So my first recommendation would be probably start with your local eye care provider and get yourself screened for diabetic retinopathy if you are diabetic.

If you do need to see a retinal specialist, your eye care provider should be able to recommend a local retinal specialist. The reason I say this and not take credit for myself is because many retinal treatments do require ongoing care and maintenance.

So if you're not in Atlanta area, though I could certainly help with diagnostic and treatment protocols, the execution of that would definitely require a local eye doctor.

And your local eye doctor would recommend somebody who's very skilled at that. And you can also reference the asrs.org website, which has very good retinal specialists in your area.

But if you're willing to visit Atlanta, you're welcome to come down. Okay. You're very humble, Dr. Mukhamala, but thank you for that. And we will put all of those links with the show notes below.

Again, thank you so much, Dr. Mukhamala for spending some time with us. We really appreciate your time and your wisdom. And I will see the rest of you during our next session together.

Thank you. Thank you. Thank you for tuning in to Doctor Talks. We hope today's episode has enlightened and inspired you on your path to optimal health.

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