Episode 1- Prof. Solomon Tesfaye - The Global Challenge DPN Around the World

Speaker 1
Welcome to Inside the Silent Storm, a comprehensive exploration of diabetic peripheral neuropathy. I'm Dr. Lim, an endocrinologist who has spent years working with people affected by this challenging condition. Diabetic peripheral neuropathy affects millions worldwide. Yet it remains one of the most underdiagnosed and undertreated complications of diabetes. Today, we begin our journey by examining diabetic peripheral neuropathy as a global health challenge.

Speaker 1
And I'm honored to be joined by a distinguished expert, Professor Solomon Tesfaye, an internationally recognized leader in diabetic complication research. A brief about Professor Tesfaye. He's a consultant Diabetologist at Sheffield Teaching Hospitals and an Honorary Professor at the University of Sheffield, UK, where he also serves as research director for diabetes and endocrinology. He is a visiting professor at Shanghai Jiao Tong University, Shanghai, China.

Speaker 1
Professor Tesfaye, thank you for joining us today to shed light on this silent epidemic that affects so many of our patients worldwide.

Speaker 2
Hi.

Speaker 1
It's really nice to have you. Professor Tesfaye, can you please kindly tell us about how severe is the conditions of diabetic peripheral neuropathy worldwide?

Speaker 2
Thank you for that question. I think that's a very, very important question. There is no direct, answer to this because it's not been done properly or epidemiological studies that have taken thus far do not have a standardized approach. And as a result, the prevalence of peripheral neuropathy, diabetic peripheral neuropathy can range from around 5% to around 60%.

Speaker 2
So there's a massive, differences because of different methods and techniques applied to diagnose peripheral neuropathy. If you use for instance, just questionnaires using MNSI, the Michigan Neuropathy Screening Instrument, the questionnaire, up to 7% will have a positive reply, to have it around 4 or above of the symptoms, but they're quite nonspecific.

Speaker 2
Symptoms. Some of them, for instance, if I ask you, you know, the MNSI asks you, do you feel weak all the time? I mean, how is that a diagnostic question? Or has somebody told you got diabetic neuropathy before? So some of the questions are pretty nonspecific. And if you

apply that, you get around 7%-10%, that's not good enough for me simply because many patients may not even have any symptoms at all, but they can have quite advanced peripheral neuropathy.

Speaker 2

On clinical examination, diabetic neuropathy should not be diagnosed by symptoms alone. It should be diagnosed by clinical examination. Because people can have sensory deficits that you can elicit by doing clinical examination. So anything that doesn't include clinical examination as an epidemiological, approach is not good enough. Now, if you use clinical approaches and rigorous clinical approaches such as clinical examination, a peripheral clinical examination using a vibration sense, using the 1 to 8Hz tuning fork, for instance, if it is done properly, when it's done properly, it means that the patient must shut their eyes, and you should give them a dummy vibration as well as a proper vibration.

Speaker 2
They should be able to distinguish one. Many times the patient has their eyes open, and when you just use the tuning fork, sometimes it is quite loud. You can actually hear it. You know the vibration. Then people will say, yes, I can feel it. So the test has got to be done properly. And that is a very good test, that if it is a graduated tuning fork, particularly if it's well calibrated one and then it's a good it's a, it's a test that will distinguish early diabetic peripheral neuropathy.

Speaker 2
Vibration sense is the first one to go. So you can use that approach to detect around 30% of people with DPN or diabetic peripheral neuropathy can be diagnosed by clinical examination and symptoms. So clinical diabetic neuropathy is found in around 30% of all people with diabetes. Now you can go one step further and you can use electrophysiology.

Speaker 2
And this can diagnose subclinical neuropathy as well. And these are well calibrated in terms of age and sex. And so you know you have to have a reference point for the electrophysiology test like nerve conduction. And using that you can detect peripheral neuropathy in around 50%. So it's a huge variation. So unless you define your cohort in terms of either a questionnaire or clinical examination or the full confirmed neuropathy, which is it includes electrophysiology, skin biopsy is not possible for a large cohort of people.

Speaker 2
It is quite invasive, but you can use QST as well. If you use QST, then that's also, you know, if it's done properly, warm threshold or cold thresholds, then you can diagnose neuropathy up to 50%. So because of lack of standardization, there's huge variation. So a recent paper by, the Michigan Group in Nature Reviews, Neurology in 2025 shows a big variation in the prevalence of DPN around the world, not because the populations are different, but because the methodology applied to diagnose peripheral neuropathy is so different.

Speaker 1
Then professor, is there any move to standardize the screening and diagnostic method, given

the variation?

Speaker 2
This is a sad aspect of diabetic peripheral neuropathy. Whereas retinopathy and there are standardization across the world. If a nephropathy the cutoff points are all determined from microalbuminuria. Usually we have albumin creatine ratios all standardized for neuropathy. Nobody has standardized this and say well epidemiological studies you have to use this across different populations. It hasn't been done yet.

Speaker 2
We did make a recommendation many years ago in the, Toronto consensus. So we said for epidemiological studies use clinical neuropathy, but nobody's really properly observed the advice. But I think there is now a need by either international bodies, the IDF, EASD, the European Association for the Study of Diabetes, or the ADA, all to come together and have a standardized approach to the diagnosis of DPN for clinical practice, for epidemiological studies, and for intensive, research studies.

Speaker 2
So when you're doing research, standardization has got to be absolutely accurate. It has to be, very, very well not loose definition. It has to be has a strong definition. So these need to be stipulated.

Speaker 1
And as a lot of us want to have this point just now, you mentioned about the term of subclinical neuropathy. So does it mean this is early stage of diabetic neuropathy. And does it mean that this is actually painless diabetic peripheral neuropathy.

Speaker 2
You know, that's a very very important question. When you go diabetic neuropathy has a subclinical phase. So during the subclinical phase a patient can have three abnormalities. It can have a small fiber abnormality. They don't have any symptoms yet. And they can have a large fiber abnormalities. Well even subclinical phase reduction nerve conduction velocity for instance large fiber myelinated fiber reduction.

Speaker 2
Or they could have pseudo motor dysfunction or they could have autonomic dysfunction. So there are many fibers. The problem with diabetic neuropathy is not one condition, one trajectory. There are 3 or 4 things happening at the same time. The pain is completely independent. It depends. You can have pain in subclinical phase. People with impaired glucose tolerance or pre-diabetes can have painful neuropathic symptoms depending on the involvement of the fibers.

Speaker 2
So the pain is operating subclinically and clinically. And a lot of these abnormalities are occurring over time slowly. You can have predominantly small fiber and pure small fiber

neuropathies, unusual diabetic neuropathies, a combination of large and small fiber neuropathy. Over time. This is progressing once you start to have clinical diabetic neuropathy, it is progressing slowly. In the first one is the vibration sense to go and then you lose your reflexes and then you lose the monofilament test.

Speaker 2
And then you developed foot ulcers and then you develop amputations. And ultimately unfortunately mortality is also greater in people with neuropathy. And so this we need to catch it early. The key point here is you either need to catch it subclinically if you can or immediately when it after is clinical because there is a window of, reversibility and the disease being halted.

Speaker 2
But then there comes a point when monofilament is positive. It's not possible to cure at that point. So people say, oh, can you cure diabetic neuropathy. Of course you can cure it if you catch it early. Very early. Like anything else. Like microalbuminuria. You can stop it. But once you have a macro albuminuria stage, once you have sort of proliferative retinopathy, there's nothing you can do.

Speaker 2
So it is a way of early diagnosing the condition. Early management intensively, which will have an impact on the disease.

Speaker 1

Thanks for highlighting the point of the importance of early detection of diabetic peripheral neuropathy. But however, Professor Tesfaye, we know that this has been, this critical condition has been under screened, under diagnosed and hence has been under treated worldwide. Any of these potential apart from the variable definition, there's a need for standardization of the tools. Do you think that some cultural perception might actually affect, the under treated scenario that we're seeing right now.

Speaker 2
So there are many factors that contribute to the under diagnosis of peripheral neuropathy. When you look at the management of diabetes worldwide, we've done we've had huge strides in the management of A1c high blood glucose. Well, many new drugs have come into play over the last 10-20 years. When you look at retinopathy screening, there have been really massive improvements in the UK, particularly we have an annual screening for everybody using digital camera.

Speaker 2
And this was introduced in 2005 and it was game changer. In the UK since 2005, everybody with diabetes must undergo an annual digital camera based eye screening with dilated pupil. And, and this has been a game changer because it's led to, proper identification of early retinopathy using artificial intelligence. Patients are referred to see an ophthalmologist. They have early treatment.

Speaker 2
This has been a game changer. How was it a game changer? Because since 2014, diabetes is no longer the commonest cause of working age blindness. Only in the UK. So that's been because everybody observes it has a very high uptake, 90% plus very high uptake. And whereas foot screening, neuropathy screening is way low, 40%, 50% have those achievement of the other eight care processes are achieved in or around 50%.

Speaker 2
So what does this show you? This shows you that people actually want to attend for eye screening because they're scared of going blind. But what does what kills people? It's actually the neuropathy. It's a major danger. So this lack of awareness from, the institutions that are there that the importance of neuropathy and emphasis, there's less emphasis on neuropathy screening.

Speaker 2
Number one. And number two, their patients also are not, have poor awareness of the importance of peripheral neuropathy. So diabetic neuropathy continues to be the Cinderella of poorly recognized complication of diabetes. It's not eye screening or screening for kidney problems, cardiovascular screening for hypertension, blood pressure, for cholesterol. All these are the key ingredients of and the doctor wants to know about.

Speaker 2
But they don't take shoes and socks off and examine the feet or ask the patients, if they have, neuropathic pain. And also culturally, many years ago, I give a lecture at the Japanese Diabetes Association annual meeting. This is, you know, almost 20 years ago, one of the professors who I know very well, actually stood up and said, well, Professor Tesfaye, we don't have painful diabetic neuropathy in Japan.

Speaker 2
And I was completely shocked and I said, sorry. Beg your pardon? Said, yeah, we don't. He said, people have a little bit of tingling here and there, but he's not really doesn't amount to, to pain. And, and this is sort of because culturally it's considered to be it's like a weakness if you have pain and you come with a complaint of pain.

Speaker 2
But that's now completely changed. If you go to Japan now, painful neuropathy is very common. And I think this also shows you if the doctor is not encouraging the patient to explain their symptoms, to present their symptoms, the patient will be reluctant or actually the patient even may not know that pain is part of diabetes. Many elderly people don't actually make the connection between the neuropathic pain that they have and diabetes.

Speaker 2
They are in their 60s, 65 and they don't. They think the pain they're getting is due to arthritis or getting old aches and pains. But actually, unless we help them, it's not up to them to diagnose themselves. It is a healthcare professional to apply appropriate instrument. So the patients diagnosed themselves. And this is what we found in Sheffield when we did a one-stop shop where patients come in, they have eye screening done.

Speaker 2
They also have all the other eight care processes A1c, blood pressure, body mass index, renal, tests of EGFR, microalbuminuria, smoking review. So in the UK in every patient must have nine care processes annually, based on NICE guidance. And, and they don't have all those done, unfortunately. But when we did it in Sheffield we found that 25% new painful diabetic neuropathy, 1 in 4 patients coming in actually reported they had painful neuropathy based on the use of, the DN4 questionnaire and the average, the mean 24-hour pain for these patients was 5.4, which is moderate to severe pain that needs treatment.

Speaker 2
So we published this in Diabetic Medicine in 2018. It's by Binns-Hall. And if you put my name as well Tesfaye in Diabetic Medicine you can read the paper. So all the under diagnosis

in painful diabetic neuropathy can be sorted by asking patients a simple questionnaire, which is the DN4 questionnaire which has about 8-9 items in it, ten items in it, seven are questions.

Speaker 2
Three are elicited using examination. But even just, you know, six questions, I say, you know, in in Malaysia when I recently visited, I saw that do you have electric shock type pain? Do you have burning pain, which is the most common pain that patients have? Do you have pins and needles or tingling. And you have contact pain. So when bedclothes see when you go into bed, when bedclothes touch your feet, does that irritate you.

Speaker 2
Do you have aches in, in your feet and you have numbness or dead feeling in your feet? We asked those six questions in our template in the UK and and these point to somebody having painful neuropathy or not, of course these symptoms must be in a distal symmetrical, anatomy. So it should affect both feet, not just one foot.

Speaker 2
So you've got to be very careful if you if the patient has just pain in one foot or then there could be an alternative explanation. So it needs further evaluation. But this is what we need to do. Every person with diabetes must have an annual screening that must include an examination. I know having this questionnaire being asked about pain, which it doesn't feature at the moment in many countries.

Speaker 2
A study we did in four European countries, which we published two years ago, demonstrated only 50% are diagnosed with Painful neuropathy, whereas 90% plus are diagnosed with retinopathy.

Speaker 1
Thanks very much for sharing your, really intense effort of integrating the comprehensive care pathways for people with diabetes at your institution. Professor Tesfaye, since, I mean, towards the last of your, discussion just now, we are seeing that it hasn’t been expanded fast enough as

what you have expected. So to date, do we or perhaps in the future, are you aware of any international initiative, to be implemented or to be enhanced in order to improve care for people with diabetic peripheral neuropathy?

Speaker 2
I have to say there haven't been many in you know, there have been some initiatives, but they tend to be piecemeal. Like, you know, I there have been some studies that were done in, for instance, this part of the world in Southeast Asia where, and some publications have been on the prevalence of DPN in various countries, but this really ideally should be done under the auspices of the International Diabetes Federation, IDF.

Speaker 2
That's what it is, therefore, it is a global institution. It should have an initiative, for instance, a symposium in one of the meetings to agree on approaches to how we should diagnose the condition, how we should detect the condition as early as possible. What methodology are we going to apply and how we are going to manage the condition as well?

Speaker 2
So, you know, it cannot be done by Europeans or Americans. It's got to be done globally by a global body and one that would be a real that would be an important approach. If we can have a fully agreed, and it has to be agreed, it's not good having a methodology which is going to work in

Europe, where or in North America, where affluent countries, but is not likely to work in developing countries.

Speaker 2
You cannot have that. There has to be a standardized approach that binds every nation in the world to adopt that, methodology.

Speaker 1
Thank you very much, Professor Tesfaye. I have learned so much insights from you today. One key message would be, in fact, 1 in 4 people with diabetes, they have painful diabetic peripheral neuropathy. If we don't screen, we won’t know.

Speaker 2
Thank you, Professor Lim.

Speaker 1
Thank you, Professor Tesfaye, for this enlightening discussion on the global landscape of diabetic peripheral neuropathy. What strikes me most is how this condition transcends throughout the borders affecting patients from all walks of life. Yet the disparities in care and outcomes remind us of the work still ahead. As we have learned today, diabetic peripheral neuropathy is not just a medical condition. It is in fact, a global health challenge that requires coordinated efforts across healthcare systems, cultures, and communities.

Speaker 1

The statistics are sobering, but the dedication of clinicians and researchers like our guest today gives us hope. In our next episode, we shall shift our focus to the individual patient experience. Exploring the first tingle, recognizing early signs of diabetic peripheral neuropathy, we will discuss why those initial symptoms are often overlooked and how early recognition can change the trajectory of this condition.

Speaker 1
Until then, I encourage our listeners, whether you are health care providers, patients, or family members, to stay informed and advocate for better diabetic peripheral neuropathy awareness in your communities. Thank you for joining us on this journey. Inside the Silent Storm. Thank you for joining us on this journey. And remember, in the fight against diabetic peripheral neuropathy. Knowledge truly is power.

Speaker 1
Until next time, take care of yourself and each other.