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A newsletter for members of Western Neuropathy Association (WNA)

FIRST EVER GENE THERAPY APPROACH FOR PERIPHERAL NEUROPATHY IN OBESE DIABETIC MICE

Ohio State University Wexner Medical Center Press Release; March 21, 2024

A first-ever study of a new gene therapy approach could one day help people who suffer from painful nerve damage, known as peripheral neuropathy, that has no known cure. The top cause of neuropathy is diabetes, which can impact more than half of patients with this disease. Researchers at The Ohio State University Wexner Medical Center led the gene therapy mouse study that is published online in the journal *Molecular Therapy*. The team used a therapeutic viral construct (adeno-associated virus or AAV) to deliver proteins called neurotrophic factors to the fatty (adipose) tissue under the skin. The job of these proteins is to help nerve cells survive, grow, and regenerate.

"Treating neuropathy in multiple tissues and organs affected by disease, including adipose tissue, is critical. Prior attempts to use neurotrophic factors were unsuccessful," said Kristy Townsend, PhD, associate professor in the Department of Neurosurgery at Ohio State. "We have overcome this hurdle by using AAV-based gene therapy to overexpress two critical neurotrophic factors for nerve survival, plasticity, and regeneration: nerve growth factor (NGF) and brain-derived neurotrophic factor (BDNF). This allows longer-term expression of these proteins, and can target expression to certain cell types, thereby avoiding unwanted side effects."

The team provided the gene therapy two ways. Both methods – a standard syringe and a new theragnostic device platform (combining therapy and diagnostic functions) delivered AAV-containing fluids and improved tissue-specific peripheral neuropathy, but the device was able to target the treatment to a specific tissue layer. "Our technical advances and approach innovations, as well as the clinical translational relevance of these gene therapy findings, could lead to new therapies," Townsend said. The theragnostic platform is called the Detecting Early Neuropathy to Treat Early Neuropathy (DEN-TEN). It is a microneedle array used for subdermal tissue delivery of AAV-mediated gene therapy.

Townsend is co-founder, Chief Scientific Officer and Chair of the Board for Neuright, Inc., which developed the DEN-TEN, which is patent pending. Townsend studies how the nervous system is affected with metabolic diseases, such as obesity, diabetes, aging, cardiometabolic disease and peripheral neuropathy. Her previous work, which has been validated by other groups, demonstrated significant neuropathy extending under the skin to the fat tissues.

"This finding is relevant given the critical role that brain-adipose neural communication plays in metabolic physiology. Loss of the nerve supply in fat tissue negatively impacts metabolic regulation, and thus 'adipose neuropathy' can worsen these metabolic disease states," said Townsend.

With peripheral neuropathy, multiple nerve types can degenerate. Symptoms are therefore complex, and can include numbness, tingling, burning, pain and motor loss. This proof-of-concept study paves the way for future gene therapies that may target other cells and tissues, to provide support for nerve regeneration.

"The timing of the therapies early in the course of developing diabetic peripheral neuropathy also is a crucial factor. There is likely a 'critical window' when treatments can be most effective," said Townsend. "A combination gene therapy approach targeting neurotrophic factors to their endogenous cell source and delivered early in the course of disease is likely to be the most effective treatment."

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PERIPHERAL NEUROPATHY SUPPORT GROUPS

VIRTUAL AND IN-PERSON FOR AUGUST 2024

*Encourage, inform, share, support, and hope.
Join a meeting to help others, learn something new, and/or share experiences.
In-person or virtual – connect to others with peripheral neuropathy.*

	Auburn CA Peripheral Neuropathy Support Group (1st Monday of the month) No meetings in July, August and September <i>Next meeting in October</i> Santa Cruz CA Peripheral Neuropathy Support Group (3rd Wednesday of the odd months) <i>Next meeting in September</i> Houston TX Peripheral Neuropathy Support Group (1st Saturday in each quarter) <i>Next meeting in September</i> Strategies for Singles with Neuropathy Support Group (1st Wednesday in each quarter) <i>Next meeting in September</i>
Virtual 10 Saturday	2nd Saturday Peripheral Neuropathy Support Group Saturday, 11am - 1pm Pacific / 1pm - 3pm Central / 2pm - 4pm Eastern Meeting ID: 856 7106 1474, Passcode: 114963 Host - Katherine Stenzel, contact Katherine for Zoom link
Virtual 14 Wednesday	2nd Wednesday Chemo-Induced Peripheral Neuropathy (CIPN) Support Group Wednesday, 2pm - 3pm Pacific / 4pm - 5pm Central / 5pm - 6pm Eastern Meeting ID: 830 5538 3243, Passcode: 396320 Host - Glenn Ribotsky, contact Katherine for Zoom link
Virtual 21 Wednesday	3rd Wednesday Peripheral Neuropathy Support Group Wednesday, 10am - Noon Pacific / Noon - 2pm Central / 1pm - 3pm Eastern Meeting ID: 833 4473 0364 / Passcode: 341654 Host - Glenn Ribotsky, contact Katherine for Zoom link
Virtual 21 Wednesday	3rd Wednesday CIDP and Autoimmune Support Group Wednesday, 3pm - 4pm Pacific / 5pm - 6pm Central / 6pm - 7pm Eastern Host - John Phillips, contact John for Zoom link
Virtual 24 Saturday	4th Saturday Peripheral Neuropathy Open Discussion Saturday, 11am - 1pm Pacific / 1pm - 3pm Central / 2pm - 4pm Eastern Meeting ID: 851 7949 9276 / Passcode: 159827 Host - John Phillips, contact Katherine for Zoom link

VIRTUAL SUPPORT GROUP CONTACTS

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John Phillips	johnphillips@pnhelp.org
Erika McDannell	ejmcdannell@pnhelp.org

Support Group information can also be found on **www.pnhelp.org** under the Support Group tab.

FROM THE PRESIDENT Pam Hart, WNA President

Well, I can certainly attest to the fact that summer is in full swing. I am sure that you are trying your best to mitigate the different climate swings. I love the tricks that people come up with – from portable fans with a sprayer attached, to frozen neck collars, outdoor patio misters and ice rollers. I prefer to jump into a pool, but that is not often handy and only lasts so long. Some people are researching ice baths for neuropathy. The main theory behind this is to lessen nerve sensitivity and inflammation– if that is what is causing your neuropathy. This does not work well for people with poor circulation, such as those with diabetic neuropathy. A foot bath with ice water can actually help to cool the whole body. This is what I would choose – no embarrassing scene with me in my bathing suit!!

Another reminder is to ingest water. Our bodies need water, which is vital for cell function and life. Drinking too much water can cause the electrolyte levels to drop which in turn can cause muscle spasms and cramping. Water consumption is tricky during the summer. Staying with the recommended eight glasses of water a day is best. Sometimes we think we are hungry, when in fact, our bodies are asking for more water. The brain recognizes these triggers as the same. Next time you are grazing, try drinking a glass of water first.

One more suggestion for the summer. Wear comfortable, breathable footwear to avoid excessive sweating and irritation. Neuropathy can make your feet more sensitive to heat and friction. Wearing sandals is the ‘summer’ thing to do, but with that comes the possibility of injury and/or getting debris in your footwear that you are not aware of. Checking your feet daily is the best preventative routine.

Continue to enjoy your summer and be sure to add suggestions as to how you “beat the heat” in your support groups.

Blessings,
Pam
pamula1@hotmail.com

CHRONIC IMMUNE-MEDIATED NEUROPATHIES - DESCRIPTIONS

Polyneuropathy may be defined broadly as the dysfunction of many or all nerves. Some of these polyneuropathies are mediated or caused by the immune system. These immune-mediated polyneuropathies can be acute, such as (GBS), or chronic, such as chronic inflammatory demyelinating polyneuropathy (CIDP) and multifocal motor neuropathy (MMN).

- **GBS is a rare neurological disorder in which a person’s immune system mistakenly attacks part of their peripheral nervous system.** GBS begins suddenly and can increase in intensity over a period of hours, days, or weeks until certain muscles cannot be used at all. Some cases of GBS are very mild and only marked by brief weakness. Others cause nearly devastating paralysis, leaving the person unable to breathe on their own. In these cases, the disorder is life-threatening—potentially interfering with breathing, blood pressure, or heart rate. Fortunately, most people eventually recover from even the most severe cases of GBS. After recovery, people may continue to have some weakness.
- **CIDP is a progressive immune-mediated disorder of the peripheral nerves attributed to demyelination and impairment of signal conduction in motor and/or sensory nerves.** Symptoms include loss of strength and sensation typically causing symmetrical, proximal, and distal weakness. Disease progression is variable, with many patients experiencing chronic patterns of relapse and remission.
- **MMN is a rare neuropathy characterized by progressive asymmetric weakness and atrophy without sensory abnormalities, a presentation similar to that of motor neuron disease.** MMN is considered an immune-mediated disorder on the basis of its responsiveness to treatment with intravenous immune globulin (IVIG), its association with anti-GM1 antibodies, and inflammatory infiltrates on nerve biopsy.

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mycme.com; Turning Complexity Into Clarity In Chronic Immune-Mediated Neuropathies: Program Description
NIH.gov; Disorders: Guillain-Barré Syndrome

HEALTH CARE CHALLENGES WEBSITES (updated)

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in your daily life.

■ HOW STRESS AND DEPRESSION AFFECT DIABETES

ClevelandClinic.org; Diabetes & Endocrinology; March 8, 2024

(Editor—as diabetes is closely associated with peripheral neuropathy, when reading this article substitute ‘neuropathy’ for ‘diabetes.’ As such, the title should read ‘How Stress and Depression Affect Neuropathy.’)

When life feels like it’s moving at an extremely fast pace, stress is often an unwelcome companion along for the ride. And while certain amounts of stress come with the territory of being human, too much of it can have a negative impact on your body and health.

If you’re someone who lives with diabetes, you may have wondered about the connection between different types of stress and diabetes. Understanding this connection is important for your health. Diabetes educator Sue Cotey, RN, CDCES, explains how stress — as well as feelings of depression — are linked to diabetes and what you can do to manage both.

How is diabetes linked to emotions?

Stress is something we all deal with, notes Cotey. It’s that feeling when life gets a little overwhelming, like when we have a lot of schoolwork or when things at home get busy. In the same sense, our health can also be a cause for stress. Whether it’s a new diagnosis or a longstanding one, living with diabetes in particular can trigger a flood of emotions. Some of these emotions can include grief, anxiety, depression, frustration, disappointment and stress. These emotions are natural responses and are experienced by many people, especially when you’re first diagnosed with diabetes. You may also feel these emotions when managing diabetes over the long term.

Emotional issues may make it harder for you to take care of yourself — to eat right, exercise and rest — which, in turn, can affect your blood sugar. In addition, you might find yourself trying to reduce stress with unhealthy behaviors, which can contribute to diabetes complications.

When we’re stressed, our bodies can go into “fight-or-flight” mode, releasing hormones like adrenaline. These hormones can make our hearts race and our muscles tense up, preparing us to handle a tough situation. But they also tell our liver to release extra sugar into our blood, which can cause glucose levels to spike. If we’re constantly stressed, this can strain our bodies’ ability to manage glucose effectively over time.

Recognizing your stress and diabetes symptoms

Most people experience stress as an emotional or physical strain. It can result in worry, anxiety and tension. Everyday events or changes in life may create stress. Stress affects everyone to some degree, but it may be more difficult to manage when people learn they have diabetes. Symptoms of stress can include nervousness, a fast heartbeat, rapid breathing, upset stomach, and depression. Stress can make it more difficult to manage your diabetes, as it may throw off your daily routine and can result in wear and tear on your body. Hormones from stress increase your blood pressure, raise your heart rate and can cause blood sugar to rise. High blood sugar can make you feel down or tired. Low blood sugar may result in you feeling upset or nervous.

How can I reduce stress in my life?

When you’re feeling the weight of stress in the moment, it may feel like it’s an impossible boulder that you can’t move. Recognizing this feeling is an important first step. Then, Cotey suggests trying some of these approaches to reduce feelings of stress:

- **Use relaxation techniques.** Practicing things like deep breathing, meditation, yoga and mindfulness throughout the day can help your body move into a calmer state.
- **Get some exercise.** You can reduce stress through activities like dancing, walking or biking. Do something that you enjoy.
- **Share what you’re going through with friends and family.** Talking about your concerns with trusted people can help relieve your stress and perhaps solve those problems.
- **Remember to keep your sense of humor.** Laughing helps reduce stress.
- **Join a support group.** You can meet people with issues similar to yours and make new friends.
- **Take your medications as directed and eat healthy meals.**
- **Seek out professional help** to talk about what’s troubling you and learn coping strategies.

— Continued on page 5

TYPE OF PERIPHERAL NERVE AND ASSOCIATED DAMAGE

MedlinePlus, National Library of Medicine, Peripheral Nerve Disorders

Nerves	Possible Symptoms Of Nerve Damage
Motor nerves control your muscles and all your movement, such as walking, talking, and using your hands.	• Weak or aching muscles • Problems with balance, walking, or using your arms and hands • Cramps or twitching muscles • Muscle shrinking
Sensory nerves carry messages to your brain from your senses, including touch, hot and cold, and pain.	• Tingling, numbness, or pain often in the hands and feet • Not being able to feel heat, cold, or pain, such as a cut on your foot • Pain from even light touch
Autonomic nerves send messages to your organs to control breathing, digestion, and other body functions that happen without thinking about them.	• A heartbeat that's too fast or too slow • Trouble swallowing • Sweating too much or too little • Vomiting, diarrhea, or constipation • Problems with urination or sexual function

MAGNESIUM AND GABAPENTIN

Gabapentin and magnesium can interact with each other. Magnesium can decrease how much gabapentin (Neurontin) the body absorbs which decreases the effects of gabapentin. If you've been prescribed gabapentin and take a medication or supplement containing magnesium, it's recommended to take gabapentin at least 2 hours before, or 4 to 6 hours after taking magnesium supplements. Talk to your healthcare provider or pharmacists about how to safely take both medications.

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Abe Amos, PharmD; Can I Take Magnesium And Gabapentin Together? GoodRX Health; June 10, 2022
Magnesium - Uses, Side Effects, And More; WebMD; retrieved December 5, 2023

HOW STRESS AND DEPRESSION AFFECT DIABETES - Continued from page 4

If you try these approaches and you still don't feel you're able to manage your stress levels, Cotey recommends contacting a diabetes educator or healthcare provider about other options you can try.

What are the symptoms of depression?

Too much stress sometimes can lead to depression. People with diabetes are more likely to experience depression than the average person. You may be at risk for depression if you have any of the following symptoms for more than a week:

- Feel sad or irritable.
- Have lost interest in activities you enjoy.
- Feel a sense of worthlessness.
- Experience a change in sleeping patterns.
- Feel fatigued or like you've lost energy.

Feelings of fatigue or feelings of worthlessness could make it harder to engage in the self-care you need to help manage your diabetes. And while these feelings can be stifling, they're not impossible to work through. Depression can be treated with lifestyle activities (like increased exercise and relaxation), medication and counseling. Speak with your healthcare provider if you're beginning to experience any of these symptoms of depression.

The bottom line

Your healthcare providers are here to help you find relief from constant stress, depression and other mental health problems that may be worsening your diabetes. Get in touch with your healthcare provider if any symptoms of stress or depression are starting to affect your day-to-day life. They can work with you to make a plan not just for managing your diabetes, but also for managing your stress and any symptoms of depression.

■ UNCOMMON CAUSES OF NEUROPATHY Glenn Ribotsky, WNA Director

Almost all who have experienced the unpleasant and sometimes debilitating symptoms of peripheral neuropathy have gone through a period during which they have had to deal with their ignorance of the condition and of its possible causes; many had never even heard the term “neuropathy” before experiencing it.

Much of the learning curve for neuropathy takes place in the process of trying to discover what may have triggered it, and most become familiar with the possibility of their neuropathy having been generated by diabetes, injury, spinal degeneration, or some form of autoimmune reaction. Still, while these cover many of the common neuropathy generators, there are literally hundreds of conditions that damage nerves, and many are obscure, even to most physicians.

Going forward I’ll be discussing an unusual cause of neuropathy every other month in this newsletter, to help those whose neuropathy is not obviously due to these more common generators—especially those who’ve been given the dreaded “idiopathic” label—and to suggest lines of inquiry for their physicians and help expand their own knowledge, making them better advocates for and partners in their own care.

Statin Neuropathies: “Iatrogenic” and underdiagnosed

The word “iatrogenic” is roughly equivalent to “undesired side effect”; it refers to a medical condition caused by a specific medical intervention (surgery, a pharmaceutical agent) designed to handle a different problem.

In the world of neuropathy, one of the most common iatrogenic causes—one that far too many people become familiar with—is chemotherapy. Many well-known cancer drugs are notorious for damaging nerves; the real problem here is that far too many people aren’t warned by their oncologists about the possibility. But there are many different drugs that can have toxic nerve effects.

One category of drugs that has been increasingly observed to cause problems in at least some people are the statins. These drugs, which have been used for the reduction of cholesterol in the service of preventing heart disease, have been around since 1987 when the FDA first approved lovastatin. There are now quite a few of them on the market, with more in the pipeline as the original patents on the early ones come closer to expiration (a number have been available as generics for the last decade).

Cause

Without getting too heavily into the chemistry of statin method-of-action, the main mechanism is the inhibition of an enzyme required for the synthesis of cholesterol in the liver—reduced cholesterol synthesis means less floating in arteries to form plaques in which a clot might get trapped. Unfortunately, the drug also seems to sometimes have negative effects on the energy-producing mitochondria in cells, with muscle cells and nerve cells being particularly vulnerable, depending on individual genetics and overall dosage. It is estimated that some 10 to 15 percent of statin users will experience a degree of muscle weakness (myopathy) from statin use, and about 5 to 10 percent will notice symptoms of neuropathy (these categories somewhat overlap).

The use of statins has become so common over the last three decades that it is perhaps not surprising they may be behind a certain number of cases of neuropathy. Unfortunately, there has been some controversy in the literature as to just how common this is. Still, if one notices neural or muscular symptoms after starting a course of statins, it certainly is advisable to bring this up with one’s physicians—particularly one’s cardiologist or endocrinologist, who tend to prescribe them more often than do primary care physicians.

As mentioned before, some of the vulnerability to neuropathy from statins seems genetic, though we are not yet sure exactly what genetic backgrounds predispose one to statin neuropathy. Since vulnerability also seems to a degree to be dose and type-dependent, a discussion of a lowest acceptable dose for the cholesterol lowering desired, or perhaps changing to a different statin, is certainly in order.

Treatment/Prevention

There is some evidence that the enzyme Cq10, also known as ubiquinol, which works in the mitochondria, is impacted by statins, and that supplementation with this enzyme may lessen or mitigate the possibility of neuropathy. Some have also reported that taking niacin, which has also been used for cholesterol-lowering effects, with a statin not only helps make the statin more effective but might also reduce the possibility of neuropathy.

Caution

This is not to say that everyone should stay away from statins; they have proven decidedly effective at lowering cholesterol and helping to prevent adverse circulatory events. But those with a neuropathy history might want to have a discussion with any physician who suggests adding them, and certainly those who experience neuropathy symptoms after starting a statin regimen need to consult closely with their providers.

– Continued on page 7

■ NEUROLOGISTS MEET WITH CONGRESS TO ADVOCATE FOR SAFE STEP ACT, MEDICARE REIMBURSEMENT, AND RESEARCH FUNDING Practical Neurology News; February 26, 2024

During February 25-27, the American Academy of Neurology (AAN) hosted the 22nd annual “*Neurology on the Hill*”, where 193 of the organization’s member neurologists from 47 US states met with federal lawmakers in Washington, DC. The primary focus of this gathering was to advocate for enhanced access to care for individuals with neurologic conditions, including migraine, Alzheimer disease (AD), multiple sclerosis (MS), Parkinson disease (PD), amyotrophic lateral sclerosis (ALS), and epilepsy, among others. Lawmakers were educated about the need for reform, with the goal of better facilitating the critical role that neurologists play in optimizing care for their patients.

AAN’s neurologist representatives specifically asked lawmakers to support the Safe Step Act [S. 652/H.R. 2630] addressing issues related to step therapy: a process whereby employer-sponsored insurance plans require patients to try less expensive medications before accessing the treatments prescribed by their physician. In their discussions with policymakers, the members of the AAN argued for reducing barriers that hinder individuals with neurologic conditions from receiving optimal care, step therapy constituting one such barrier. According to a statement from the AAN, the Safe Step Act would streamline access to effective treatments and ensure timely interventions for patients.

“Decreasing barriers is essential in ensuring people with neurologic conditions receive the appropriate care in a timely manner,” said Carlayne E. Jackson, MD, FAAN, President of the AAN. *“Step therapy protocols often cause delays in care and do not consider a person’s unique circumstances and medical history. The Safe Step Act would reform the process of step therapy.”*

The AAN members also advocated for the Strengthening Medicare for Patients and Providers Act (H.R. 2474), which is proposed to assist physician practices through rising inflation. Additionally, the neurologists asked lawmakers to increase funding for the National Institutes of Neurologic Disorders and Stroke (NINDS), as well as the National Institutes of Health’s (NIH’s) Brain Research Through Advancing Innovative Neurotechnologies (BRAIN) Initiative, which is a partnership between federal and nonfederal stakeholders with the aim of advancing neurotechnological interventions for neurologic conditions.

■ TIDBITS FROM THE VIRTUAL SUPPORT GROUP SESSION - JUNE 19, 2024 Katherine Stenzel, Editor

There are so many lotions and creams on the market that can help with neuropathy symptoms. During the June 19th support group session, two lotions were suggested that helped these attendees. Joyce Vandemeyer uses MOOV spray at night when she is awakened with pain in her legs. She can easily spray it on and says she gets relief quickly. Another group participant suggested that Topricin Foot Cream was effective for them. A discussion on drug interactions lead to a recommendation of checking Drugs.com when starting or adding a new medication or supplement to your existing medications. I found it interesting that when I checked the website, the trending searches included gabapentin and gabapentin topical.

UNCOMMON CAUSES OF NEUROPATHY - Continued from page 6

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IN THIS ISSUE

Those of you that attend the virtual support groups and/or have watched our webinars are familiar with the exhaustive knowledge of peripheral neuropathy belonging to WNA Director Glenn Ribotsky. This month he will again share this knowledge with us through a series of articles on **uncommon causes of neuropathy**. He starts the series with statins, which has received some press lately as a medication that could generate peripheral neuropathy symptoms. The series will appear every other month. Read page 6 for his first column.

The front-page article discusses a new way to deliver nerve growth factor (NGF) and brain-derived neurotrophic factor (BDNF) to the fatty tissue under the skin. These **neurotrophic factors help nerve cells survive, grow, and regenerate**. A first step in a potential treatment!

And finally, page 7 details the American Academy of Neurology's efforts to support the Safe Step Act by appearing before Congress in late February. This Act is one way to **reduce barriers for individuals with neurologic conditions** to receive physician prescribed treatment without insurance companies requiring patients to try less expensive medications first.

May these give you Hope.

..Katherine

klstenzel@hotmail.com



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Our mission is to provide support, information and referral to people with neuropathy and to those who care about them, to inform and connect with the health care community, and to support research.

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