



Nerve center

Scientists and physicians battle 'silent disease,' peripheral neuropathy

By Terri Yablonsky Stat

Special to the Tribune

Published June 27, 2004

Testing a mouse's grip strength and observing its gait may lead to better treatments for the 20 million Americans with peripheral neuropathy.

The common nerve disorder is caused by damage to the peripheral nerves--those that carry signals from the brain and spinal cord to the limbs, skin and internal organs.

Such research is under way at the Jack Miller Center for Peripheral Neuropathy at the University of Chicago, established in 2001 with the financial support of Jack Miller, a Chicago businessman who has the condition.

Miller, 75, had severe pain in his feet for years and sought out physicians across the country before he finally was diagnosed with peripheral neuropathy. He has been instrumental in promoting research into this often-misdiagnosed disorder.

"Peripheral neuropathy is 'the great silent disease,'" Miller said. "Neurological diseases have taken a back seat to other diseases."

Peripheral neuropathy has many causes: injury to the nerves; damage to or swelling of the sheaths around nerves, such as in carpal tunnel syndrome; circulation problems; autoimmune diseases such as arthritis; bacterial or viral infections; diabetes; or reaction to drugs or chemicals, according to Dr. Raymond Roos, co-director of the center's neuropathy clinic and chair of the department of neurology at the University of Chicago. For many sufferers, however, the cause is unknown. It mainly affects older adults. Patients with peripheral neuropathy often begin to experience pain, tingling, numbness or weakness in their feet or hands. The condition can lead to significant discomfort and disability.

Two years ago, Raymond Laskowski, 69, felt ill for several months. He thought it was the flu, and his family doctor agreed. But soon he broke out in a rash and within days could no longer walk. Tests revealed he had vasculitis, an inflammation of the blood vessel system, which can lead to peripheral neuropathy.

Laskowski was treated at the center with intravenous immunoglobulin G, steroids and pain medication.

"They worked," he said. Within two weeks, he was using a walker, and the South Side resident has slowly regained use of his legs.

"I'm walking again and hopefully I'll run and play tennis again someday," he said.

Although other institutions also treat patients with peripheral neuropathy, the Jack Miller Center has both clinical and scientific focuses, Roos said.

"One of our goals is interaction between our scientific and clinical areas so we can translate the

research and `bring the bench to the bedside,'" he said.

Education is another goal. The center recently held its first symposium on peripheral neuropathy, which was attended by more than 160 scientists and physicians nationwide.

All pain comes via the peripheral nerves into the central nervous system, Roos said. "If one understood the pain pathways via the peripheral nerves, one might have an incredibly powerful handle on new drugs and treatment for pain."

Neurologists at the center take a medical history and examine new patients to help clarify the location of a sensory or motor problem, Roos said. They then do diagnostic tests such as nerve conduction studies, nerve biopsies and blood studies.

"Our goal is to try to determine the cause of peripheral neuropathy, then to treat the cause," Roos said. "For example, if we determine that a neuropathy is caused by vitamin B-12 deficiency, we can treat the patient with vitamin B-12."

Treatments for weakness or pain include physical therapy, use of walking-assisted devices or referral to a pain clinic.

Genes are important in determining the cause of some peripheral neuropathies, Roos said. "They are also important in helping us understand susceptibility in more complex situations. For example, why do some patients with diabetes develop a neuropathy and others do not? In addition, genes will clarify why one patient may improve with a particular drug or develop side effects from it, while other patients will not."

The recent sequencing of the human and mouse genomes has been invaluable in the study of peripheral neuropathy, said neuroscientist Brian Popko, who oversees research at the Jack Miller Center.

"If a mouse has certain problems, such as tremors, we try to find the gene responsible." Popko said. "We try to figure out what the gene does in a normal situation. Once we know that, we are in a position to understand the origin of a particular type of peripheral neuropathy."

"We use genetics as a way to approach both genetic and non-genetic forms of neuropathies. By understanding the molecular basis of these diseases, we are in a position to design rational therapeutic approaches--from drugs to gene therapy to stem cells."

Research into the peripheral nervous system may help elsewhere. Roos said. "We're going to learn about diseases of the central nervous system by studying diseases of the peripheral nervous system and vice versa."

For example, the study of Guillain-Barre syndrome, in which the body's immune system attacks part of the peripheral nervous system, may help in understanding multiple sclerosis, a disease of the central nervous system.

Peripheral nerves are more accessible than the central nervous system--they are easier to examine and to biopsy, according to Roos. "The peripheral nervous system gives us a window to the central nervous system that's easy to study and has been neglected," he said.

For more information about the Jack Miller Center for Peripheral Neuropathy, go to **millercenter.uchicago.edu** or call **773-702-5800**.