

New Research May Return Function to Feet

Early findings from a new APERF-funded study suggest that sensory nerve stimulation (SNS) may result in an improvement of nerve function to the feet of people with nerve damage as a result of diabetes (diabetic peripheral neuropathy).



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Podiatry researcher Rajna Ogrin is undertaking the research with Associate Professors Zeinab Khalil and Peteris Darzins at the National Ageing Research Institute in collaboration with Melbourne and Monash Universities. The work is significant because diabetic peripheral neuropathy (DPN) is a strong risk factor for foot ulceration in the diabetic population, with the majority of foot ulcers resulting from minor trauma in an insensate foot. Further, foot ulceration is a precursor to lower extremity amputation in a significant number of cases of people with diabetes: the rate of amputation is 15 times higher in people with diabetes compared to those without diabetes. Therefore, neuropathy is a significant factor in the formation of foot ulcers, which are expensive to treat and have a high risk of leading to amputation.

Currently there is no available treatment for DPN. However, previous work done by Associate Professor Zeinab Khalil showed that sensory nerve stimulation (SNS) could improve nerve function in older people, where deterioration occurs as part of the ageing process.

As diabetes is likened to an accelerated ageing, it is believed this treatment would be very useful for people with damaged nerves due to diabetes.

"The nerves in the feet contain sacs that release a number of chemicals. These chemicals have a variety of activities including accelerating wound healing, nerve maintenance and nerve repair," Ms Ogrin says. "When the nerves are damaged they don't function as well and this reduces the release of these chemicals. This in turn can limit the ability of the feet to heal if cut or bruised and reduce repair of any minor nerve damage that generally occurs on a daily basis."

The study, a double-blind randomised trial on 65 participants with diabetic peripheral neuropathy over 55 years of age, measures the effect of sensory nerve stimulation (SNS) on damaged nerves in the feet, hypothesizing that such stimulation may improve overall nerve function.

Preliminary findings show that SNS, using a low frequency electric current, applied to the feet of 33 participants twice daily for five minutes over a 12 week period resulted in improvements in nerve mediated parameters including skin blood flow, oxygen tension and sensation. The study will continue with just over 30 more participants, with the final results to be collated in mid-2004.

"We expect to show that the relatively inexpensive, non-invasive SNS technique results in a clinically significant improvement in nerve function," Ms Ogrin says. "This treatment has the potential to improve foot sensation in people with DPN, which is one of the precursors to foot ulceration. If sensation is improved, this would have significant impact on reducing rates of ulceration and, ultimately, amputation in people with diabetes."

Further, the research team believe that the benefits of this therapy may extend beyond people with diabetes. Sensory nerves maintain skin integrity by a micro-release of a variety of chemicals. One of the effects of age is that the skin becomes thinner and much more easily damaged due to the reduction in the release of these chemicals. If this therapy is shown to improve sensory nerve function then the regular use of SNS may help maintain (if not improve) skin integrity in the older population. This in turn may help to prevent the formation of leg ulcers, a problem that is much more common in the older population. This treatment could then markedly improve quality of life of older patients as well as deliver significant cost savings to the health budget.

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