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Diabetes: Tighter control of blood sugar prevents nerve condition, but at what risk?

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Aggressive control of blood sugar levels in diabetes can help to prevent a painful condition affecting patients' nerves, according to a new systematic review in the *Cochrane Library*. However, the review suggests that optimal target levels need to be established to prevent serious complications.

People with diabetes control their blood sugar levels through insulin injections, diet and drugs, to compensate for their bodies producing too little insulin (type 1 diabetes) or becoming resistant to insulin (type 2 diabetes). Up to half of people with diabetes develop a disabling condition called diabetic neuropathy, which affects nerves in the feet and legs, making them feel tingly, numb, painful or weak. It is possible to prevent neuropathy by strict control of blood sugar levels through a number of ways including different insulin regimens and diet modification, but evidence for the effects of this approach, known as enhanced glucose control, has not been systematically reviewed until now.

The results analysed in the review are drawn from six studies investigating the risk of neuropathy in people who received enhanced glucose control treatments including extra insulin injections, antidiabetic drugs, and diet changes. The review looked at evidence in type 1 and type 2 diabetes separately. In two studies involving 1,228 people with type 1 diabetes significantly fewer people developed neuropathy each year with enhanced glucose control treatment compared with routine care. In four studies involving 6,669 people with type 2 diabetes the

reduction in new cases of neuropathy was small and not statistically significant.

"Overall, this evidence suggests that a more aggressive approach to controlling sugar levels can be effective in delaying the onset of neuropathy in diabetes," said lead author of the review, Brian Callaghan, M.D., Assistant Professor in the Department of Neurology at the University of Michigan in Ann Arbor, Michigan, US. "The results also highlight the differences between type 1 and type 2 diabetes. The less dramatic effect of enhanced glucose control in type 2 diabetes may indicate that other factors, besides high glucose levels, may be important in causing nerve damage in these patients."

However, the risk of adverse effects associated with the treatment, including hypoglycaemia, was higher with enhanced glucose control. The researchers say further research is needed to optimise target levels for safe treatments that will both prevent neuropathy and minimise serious side effects.

"Although these results show clear benefits for preventing neuropathy in people with diabetes, they should be weighed against potential adverse effects," said Callaghan. "Future studies must establish target levels for glucose control that will balance benefits and side effects."

More information: Callaghan BC, Little AA, Feldman EL, Hughes RAC. Enhanced glucose control for preventing and treating diabetic neuropathy. *Cochrane Database of Systematic Reviews* 2012, Issue 6. Art. No.: CD007543. DOI: 10.1002/14651858.CD007543.pub2