New technique improves blood sugar control for people with diabetes

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A study by researchers at Karolinska Institutet conducted in collaboration with several other European research centres evaluates a device for measuring sugar levels in the subcutaneous fat of people with type 1 diabetes. The results, published in the journal *The Lancet*, show that the patients controlled their blood sugar much more often with the new, simpler technique and obtained safer glucose control.

The new technique involves the subcutaneous placement of a glucose sensor on the upper arm, enabling patients to easily take readings to monitor their current sugar control and see if the sugar level is stable, rising or falling. They can then preventatively make the necessary adjustments with more insulin or carbohydrates.

"The idea is that the new technique will replace normal blood sugar tests," says principal investigator Jan Bolinder, professor of clinical diabetes research at Karolinska Institutet's Department of Medicine, Huddinge.

The glucose sensor used in the study is called FreeStyle Libre and is already available on the market in Sweden and other European countries. However, this is the first publication where the technique has been evaluated in a randomised controlled study.

Higher risk of hypoglycaemia

The apparatus was tested on a group with well-controlled insulin-treated (via injection or pump) type 1 diabetes. Such patients run a higher risk of hypoglycaemia (low blood sugar), since the buffer zone between normal and low blood sugar is relatively narrow.

A control group continued to use the conventional finger-prick means of checking their blood sugar. Masked sensor readings were also taken on this group for two consecutive weeks after intervals of three and six months to obtain comparative, detailed data on their sugar control over a 24-hour period.

"The intervention group were able to use the device continuously for six months as often as they wanted, which immediately tripled the average daily frequency of self-testing" says Professor Bolinder.

Increased the number of self-controls

The patients randomly assigned to the Libre group immediately increased the number of self-controls from around five or six times a day to around 18. As a result of this, incidences of low blood sugar levels dropped by 38 to 65 per cent, accompanied by a reduction in the number of hypoglycaemic episodes by 33 to 55 per cent. There was also a shortening of the time spent with excessive blood sugar levels, while that spent with optimal sugar control increased.

"We also used questionnaires on different aspects of life quality and satisfaction with the treatment, and here too we could see positive results," says Professor Bolinder.

What do you hope will come of your results?

"It's important to evaluate assistive technology that can make life easier

for patients with diabetes and help them obtain better and more stable sugar control. I hope that our positive results will help give more patients access to this type of aid."

Have any new issues arisen that you would like to investigate further?

"Our study examined well-controlled patients. New research is needed to see if this self-help device can also improve sugar control for patients who don't attain our treatment targets."

More information: Novel glucose-sensing technology and hypoglycaemia in type 1 diabetes: a multicentre, non-masked, randomised controlled trial. DOI: dx.doi.org/10.1016/S0140-6736(16)31535-5

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