

Magnetic pulses lower blood sugar of diabetic patients with excess belly fat: Study

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A local study has found that non-invasive magnetic pulses lower the long-term blood sugar of diabetic patients with excess belly fat.

The exploratory study by Singapore General Hospital (SGH) and the National University of Singapore (NUS) involved 40 adult patients with poorly controlled Type 2 diabetes, providing insight into a possible adjuvant therapy to tackle diabetes.

They each underwent weekly sessions – over 12 weeks – of non-invasive magnetic pulses delivered into one leg for 10 minutes, and on alternate legs each week.

The use of such low-dose pulsed electromagnetic fields mimics the effects of exercise by stimulating the mitochondria, which produces energy for the body.

A blood test was done before and after the 12 sessions. Patients with excess belly fat benefited the most from the treatment, with their blood sugar reduced to a level that was close to the target range for well-controlled diabetes.

The results were published in the *Journal of Clinical Medicine* in Sep-

tember.

Specifically, a haemoglobin A1c (HbA1c) blood test was done. HbA1c levels reflect the patient's average glucose level over the last two to three months, through measuring the amount of glucose (sugar) attached to HbA1c, a protein found in red blood cells.

Among the nine patients with central obesity, defined by having a waist circumference equal to or wider than the hip circumference, close to 90 per cent saw their HbA1c levels drop from 7.5 per cent to 7.1 per cent after 12 weeks of treatment. The target range for well-controlled diabetes is between 6.5 per cent and 7 per cent.

Comparatively, only one-third of the 31 patients without central obesity saw a reduction in HbA1c levels.

“With an improvement in their HbA1c levels, their incidence of long-term complications such as damage to their kidney, eyes, heart and nerves would be lowered,” said Dr Tan Hong Chang, a senior consultant in SGH's endocrinology department.

The study comes amid rising obesity here. The latest National Population Health Survey showed that obesity rates rose to 12.7 per cent from 10.5 per cent between

2019 and 2024.

Health Minister Ong Ye Kung has said that this is a worrying sign which, together with poor mental health, “demands urgent and collective attention”.

Doctors usually advise patients with diabetes to exercise, besides taking medication and keeping healthy diets, to keep their blood sugar levels in check.

But most do not exercise.

“For those who cannot exercise for various reasons, the device is a good option to consider,” said NUS Research Associate Professor Alfredo Franco-Obregon.

The Bixeps machine which delivered the treatment was developed by Prof Franco-Obregon when he was with Swiss university ETH Zurich. It was completed at NUS, where he is working currently at the Institute for Health Innovation & Technology, and the department of surgery in the NUS Yong Loo Lin School of Medicine.

He is also one of two co-owners of QuantumTX, the company hived off to commercialise the device.

The SGH and NUS researchers aim to recruit more patients for longer-term studies. The next trial will likely involve 100 to 200 patients with diabetes, central obesity and sarcopenia, a condition that



The research team behind the exploratory study by Singapore General Hospital and NUS includes (from left) Dr Tan Hong Chang, a senior consultant in SGH's endocrinology department, NUS Research Associate Professor Alfredo Franco-Obregon and Dr Tseng Fan Shuen, a resident in SGH's internal medicine department. ST PHOTO: SHINTARO TAY

occurs when older adults lose muscle mass, strength and function.

Slated to last up to one year, the

trial aims to determine the optimal treatment duration and frequency, and identify the patient groups

likely to benefit the most.

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