Diabetes

Afternoon exercise more beneficial for blood glucose than morning exercise in type 2 diabetes

A small but well designed pilot study from Scandinavia has suggested that afternoon exercise improves blood glucose in type 2 diabetes more effectively than exercise in the morning.

Eleven men with type 2 diabetes controlled by diet alone or with metformin were selected for the study. Inclusion criteria were age 45-68 years and BMI 23-33 kg/m^2. Exclusion criteria included treatment with insulin, a history of smoking in the past 6 months or the presence of another systemic illness i.e. cardiovascular, rheumatoid, blood borne or neoplastic disease. The study design was a randomised crossover trial. The research team were not blinded to the group assignment.

The trial involved two weeks of either morning or afternoon high intensity interval training for three sessions per week on a bicycle ergometer supervised in the gym. This was followed by a two-week washout period and then two weeks of the opposite regimen. Patients were fitted with continuous glucose monitors and data were collected for two weeks before training commenced, to give baseline measurements, and throughout the trial period.

Morning high intensity interval training was associated with higher glucose levels (6.9 ± 0.4 mmol/L) on the exercise days during week 1, compared with both the pretraining period (6.4 ± 0.3 mmol/L) and afternoon exercise (6.2 ± 0.3 mmol/L and 6.1 ± 0.4 mmol/L for weeks 1 and 2, respectively).

Conversely, high intensity interval training in the afternoon reduced the continuously monitored glucose levels during weeks 1 and 2 compared with both the pre-training period and the morning exercise regimen.

Of the other biochemical parameters measured, high intensity interval training was associated with a rise in TSH generally, and reduced T4 levels with afternoon exercise, and unchanged levels with morning exercise. This is interpreted by the authors as evidence of afternoon exercise potentiating TSH and T4 responses.

Because many of the systems affected by exercise are subject to circadian rhythm, the researchers were interested in establishing whether time of day affected the response to high intensity interval training. Previous research has shown that both skeletal muscular strength and mitochondrial function peak in late afternoon.

The study authors state: 'Our results are clinically relevant, showing that timing of exercise affects the glycaemic response to high intensity interval training in men with type 2 diabetes.'

'Our data highlight the importance of optimising the timing of exercise sessions to improve glycaemic control in people with type 2 diabetes,' they add.

This was a pilot study, and a study involving larger numbers of participants with longer duration of each of the interventions is planned.

'Future studies are warranted to characterise the underlying hormonal and metabolic changes to exercise training at different times of day in healthy and diseased populations,' the study authors say.

Many patients find sustained lifestyle change challenging, and GPs should always support any increase in activity as a positive outcome. Giving the optimum advice to this group is important.

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Savikj M, Gabriel BM, Alm P et al. Afternoon exercise is more efficacious than morning exercise at improving blood glucose levels in individuals with type 2 diabetes: a randomised crossover trial. *Diabetologia* 2019;62(2):233-37

Addiction

Deaths associated with opioid overdose increase

A study from Ontario, Canada, has found that prescribed, diverted and illicit opioids all play an important role in the recent increase in opioid-related deaths.

The investigators conducted a population-based cohort study, examining data on 2,833 residents of Ontario who died of opioid-related causes between January 2013 and December 2016. Active opioid prescribing was defined as having at least one day's supply of a drug overlapping the date of death, and recent opioid prescriptions as those dispensed 30 days, 180 days, one year, two years, and three years before the date of death. The study also reviewed benzodiazepine and specific aspects of fentanyl prescribing. Post mortem toxicology results were obtained for all deaths.

The mean age at death was 43 years, and 67% of those who died were male. Nearly 9% had been admitted for non-fatal opioid overdose in the year before death, 26% had a diagnosis of alcohol misuse disorder and 42% had visited an emergency department for the management of a mental health problem in the preceding three years.

In 2013, 38% of those dying of opioid-related causes had an active opioid prescription on their date of death. Although the absolute number of deaths involving an active prescription increased by 15% between 2013 and 2016 (from 241 to 278 deaths), the proportion of all deaths with an active opioid prescription fell to 32.5% in 2016. However, in 2016, 80% of those attending an emergency department for an 'opioid toxicity event' had received a prescription opioid in the