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Coffee, diabetes and insulin sensitivity

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To the Editor: Two recently published studies have suggested that habitual consumption of coffee reduces the risk of developing type 2 diabetes [1, 2]. The mechanisms involved are unknown but are likely to relate to the effects of caffeine on insulin action. Although acute studies show that caffeine loading is associated with a reduction in insulin sensitivity, this effect appears to be lost following sustained consumption [3].

In type 1 diabetes, caffeine has been reported to enhance the symptomatic and hormonal responses to hypoglycaemia [4], but its effects on insulin sensitivity are unknown.

In 1999 a 33-year-old man, a long-term consumer of coffee, was converted to continuous subcutaneous insulin infusion as part of a clinical trial. He developed type 1 diabetes at the age of 3, but apart from diabetic retinopathy, has remained well with HbA_{1c} levels of between 7 and 8%. Recently, on two occasions separated by 2 weeks, he consumed his usual breakfast (a bowl of cereal) but kept the background insulin infusion rate unaltered. At 10.30 h on the first occasion, he drank a cup of instant coffee with a dash of semi-skimmed milk (no sugar). Subsequently, identical cups of coffee were consumed hourly, the last one taken at 16.00 hours. Two weeks later he drank equivalent volumes of diluted Ribena Light at the same time, but he drank no coffee. Fingerstick glucose levels were checked before each drink (Fig. 1). Here, excessive coffee ingestion was associated with marked hyperglycaemia. Although tolerance is well recognised, not all of the physiological responses to sustained caffeine use are attenuated with sustained consumption [5, 6]. Excess ingestion of coffee may be a contributing factor in patients with sub-optimal glycaemic control. Like many pleasurable things in life, a little of what you fancy does you good; too much, and trouble can ensue.

Fig. 1 Fingerstick glucose levels before and after ingestion of hourly cups of coffee (*light bars*) or diluted sugar-free Ribena Light (*dark bars*), which followed a normal breakfast. The 16.00-hour blood test with caffeine was associated with ketonuria. Fasting basal rates were unchanged

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