

Diabetes shouldn't deter young athletes: study

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A new study led by York University researchers finds that young athletes with Type 1 diabetes may experience a marked decrease in performance as a result of their blood sugar levels.

The study, published in the *International Journal of Pediatrics*, reports that participants' athletic prowess was sapped by low blood glucose, a condition known as [hypoglycemia](#). Their [cognitive abilities](#) also declined as a result.

"[Physical activity](#) itself is unfortunately one of the factors that can cause this dip in blood sugar to occur," says lead researcher Michael Riddell, associate professor in York's School of Kinesiology & Health Science, Faculty of Health.

"Parents tend to get quite concerned about this, understandably so," says Riddell, who was diagnosed with the disease at age 14 and regularly engages in competitive sports. "They wonder, 'should I have my child enrolled in sports at all? Is vigorous activity safe?' Our results show that those with diabetes can compete on equal ground, provided they learn to manage their condition."

The study is the first to examine these interactions in a real-life setting. Researchers outfitted participants with 24-7 glucose monitors during a week-long diabetes sports camp at York University, testing their skills in tennis, basketball or soccer at various times during the day and recording [blood sugar levels](#). Participants, who ranged in age from 6 to 17, were

even monitored as they slept using this new technology. Data for the study was recorded during last summer's camp; it will run again this year starting July 19.

Researchers found that sport skill performance was highest when blood glucose values were in a "normal" glycemic range. During hyperglycemia - or elevated blood sugar - results were only slightly reduced. This occurred nearly universally across all participants, however results suggest the degree to which one's sport performance deteriorates depends on the individual.

"Some subjects showed only minor reductions in performance with hypoglycemia while others showed much greater impairment," Riddell says. "This could be related to the level of blood glucose concentration, the rate at which glucose drops, and the individual's capacity to maintain focus in the face of all these factors."

Regular exercise is known to be beneficial for people with diabetes, but can make glycemic control challenging. This balance is even more difficult to achieve in adolescents, as insulin requirements are influenced by fluctuating nutritional intake, physical activity levels, and the rhythms of other anti-insulin hormones. Adding to the confusion is that the symptoms of low or high blood glucose are often masked by exercise, because they're so similar: increased heart rate, sweating, shakiness, fatigue and dehydration.

"Any obvious issues with performance - poor passing, failed free throws and serves - that are really out of the ordinary should be a warning sign to check blood glucose levels and add carbohydrates," Riddell says. The best way to boost blood sugar levels is to consume about 15-30 grams of a fast-acting carbohydrate, such as dextrose tablets, juice or a sports drink. "These are rapidly absorbed and immediately replenish the very small reserve of glucose normally found in the blood stream," he says.

Incidents of moderate to severe hypoglycemia were common on the evenings following sports camp participation. However, researchers found no evidence that a bout of nocturnal hypoglycemia influences sport skill performance the following day. Cognitive testing also showed that participants' reading ability was lower during episodes of hypoglycemia, as was the ability to distinguish and name colours.

Riddell notes the importance of conducting this type of field research, as opposed to lab-based studies. "Actually playing a sport involves different cognitive processing, reaction time and motor skill performance," he says.

More information: The paper, "Blood glucose levels and performance in a sports camp for adolescents with type 1 diabetes mellitus: A field study" is co-authored by Dylan Kelly, a McMaster University undergraduate student under Riddell's supervision, and Dr. Jill Hamilton, pediatric endocrinologist, The Hospital for Sick Children, University of Toronto.

Provided by New York University

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