

Congenital heart disease causes hypoglycaemia

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In a new study, scientists from University of Copenhagen document a connection between congenital arrhythmia and the bodies' ability to handle sugar. The results can be of vital importance for patients with the disease and for the future treatment of diabetes. The new study has just been published in the scientific journal *Diabetes*.

In this new study, scientists from University of Copenhagen show that [patients](#) with congenital arrhythmia produce twice the amount of insulin after consuming sugar, compared to healthy subjects. At the same time, the patients' [blood sugar](#) decreases drastically a few hours after consuming sugar or food, compared to the healthy subjects, who maintain a stable blood sugar. 14 patients with congenital heart disease and 28 healthy control subjects participated in the study that has just been published in *Diabetes*.

"New research shows that patients with a particular kind of congenital arrhythmia become hypoglycemic after meals; this further increases their risk of heart failure. For that reason, the patients have to pay attention, and for example by changing diet and lowering the meal size to avoid [low blood sugar](#) levels," says Assistant Professor Signe Torekov, Department of Biomedical Sciences and The Novo Nordisk Foundation Center for Basic Metabolic Research at University of Copenhagen.

In general, hypoglycemia is rare, and when it occurs, the cause is often unknown.

"Here, we have found a new cause. On a long term basis, the results can also be of importance to the treatment of diabetes, since the quality of the treatment increases as we uncover more aspects of the sugar metabolism," explains Signe Torekov.

The scientists have measured the participants' blood sugar by taking blood tests. Also, the patients' blood sugar was measured regularly over a period of seven days through a small plastic tube placed in the skin on their stomachs. The tube was connected to a mini-computer.

Blood sugar is the most commonly used name for the amount of sugar in the blood. Healthy persons without diabetes usually have a blood sugar value between 3-4 and 7 mmol/l. Low blood sugar can cause i.e. anger and irritability, fatigue and dizziness. Very low blood sugar causes blackouts, cramps and, ultimately, heart failure.

More knowledge about the sugar metabolism

The period of time ranging from the hearts' chambers pull together until they're relaxed again is called QT-interval. Long QT-syndrome is a [congenital heart disease](#) that affects 1 out of 2.000 people. The disease causes arrhythmia that in a worst case scenario can cause heart arrest:

"We already knew that a certain [ion channel](#) - kind of an on/off-switch within a cell – is significant to genetically determined arrhythmia.

This same ion channel is also present in the insulin producing cells. Cell-studies have shown that when you turn off the ion channel, the cells of the pancreas produce more insulin. Therefore, we wanted to look into these heart patients' blood sugar, as they're born with this ion channel turned off," says Signe Torekov.

To do this, Torekov, together with i.a. Associate Professor Jørgen

Kanters, Professor Jens Juul Holst, Professor Oluf Pedersen and Professor Torben Hansen from Department of Biomedical Sciences and The Novo Nordisk Foundation Center for Basic Metabolic Research at the Faculty of Health and Medical Sciences, recruited 14 patients from Aalborg and Gentofte hospitals with Long QT-syndrome to participate in the study.

"Until now, doctors have thought that symptoms like fatigue and malaise in these heart patients were only caused by their arrhythmia, but the feelings of discomfort were also caused by their blood sugar being too low. With our discovery we can connect a specific potassium-ion channel to [blood sugar levels](#), and this could benefit the diabetes patients of the future, because we will be able to gather more knowledge on the bodies' [sugar metabolism](#)," concludes Signe Torekov.

Provided by University of Copenhagen

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