

Artificial pancreas in pregnancy promises fewer diabetes deaths

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(PhysOrg.com) -- Cambridge research funded by the health charity Diabetes UK has for the first time successfully demonstrated the potential of an artificial pancreas in pregnant women with Type 1 diabetes. It is hoped the development could drastically reduce cases of stillbirth and mortality rates among pregnant women with the condition.

Pregnancy poses additional risks for women with diabetes as hormonal changes make it very difficult to keep blood glucose levels within a safe range, and especially at night. Babies of women with diabetes are five times as likely to be stillborn, three times as likely to die in their first months of life and twice as likely to have a major deformity. Two in three mothers with pre-existing diabetes have [Type 1 diabetes](#). Hypoglycaemia (low blood glucose levels) in pregnancy is also a major cause of maternal mortality.

Published in the February issue of *Diabetes Care* and led by Dr Helen Murphy of the University of Cambridge's Department of Clinical Biochemistry in collaboration with Dr Roman Hovorka's group at the Institute of Metabolic Science, the study evaluated the performance of an [artificial pancreas](#)

or 'closed-loop insulin delivery system' in ten pregnant women with Type 1 diabetes. The researchers found the device was able to automatically provide the right amount of insulin at the right time, maintain near normal blood glucose levels and, in turn, prevent nocturnal hypoglycaemia ([low blood sugar](#)) in both early and late pregnancy.

The artificial pancreas was created by combining a continuous glucose monitor (CGM) with an [insulin pump](#), both of which are already used separately by many people with Type 1 diabetes. Previous studies have shown improved blood glucose control and reduced hypoglycaemia with overnight use of an artificial pancreas in children with Type 1 diabetes but this is the first time it has been successfully used in pregnant women with the condition.

"For women with Type 1 diabetes, self-management is particularly challenging during pregnancy due to physiologic and hormonal changes. Previous studies indicate that pregnant women with the condition spend an average of ten hours a day with glucose levels outside the recommended target," said Dr Murphy.

"These high [blood glucose levels](#) increase the risk of congenital malformation, stillbirth, neonatal death, preterm delivery, macrosomia [oversized babies] and neonatal admission. So to discover an artificial pancreas can help maintain near-normal glucose levels in these women is very promising," she added.

Diabetes UK Director of Research, Dr Iain Frame, said: "Although early days, this exciting area of research has huge potential to make pregnancy much safer for women with Type 1 diabetes, and their babies. It's a fantastic example of how existing technologies, in this case, insulin pumps and CGMs, can be adapted and developed to benefit as many people with diabetes as possible.

"We now need to see an extension of this study, one which tests larger numbers of women, and then take it out of the hospital and in to the home setting."

Provided by University of Cambridge

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