Medical Xpress

New method improves ability to continuously measure glucose in diabetic patients

May 8 2013

Researchers at the Universitat Politècnica de València and the Universitat de Girona have developed a new method for continuous glucose monitoring in patients with type 1 diabetes. It is based on a new calibration algorithm which is adapted to existing treatment devices and increases the accuracy in estimating blood glucose and helps regulate a controlled and automatic insulin release. The system has been patented by the two Spanish universities.

"Our method is a step towards the development of an "artificial pancreas " for an automatic glycemic control and helps improve the quality of life of patients with diabetes mellitus type 1," says Valencian researcher Jorge Bondia.

Currently, explains Jorge Bondia, the patient is subjected to intensive insulin therapy, either by multiple daily injections or continuous infusion using insulin pumps. However, intensive insulin therapy increases the episodes of hypoglycemia, which can have serious consequences such as diabetic coma. Thus, blood glucose monitoring is an essential element in the treatment and control of diabetic patients.

This type of monitoring is based on the measurement of glucose concentration in interstitial fluid. "To carry out these studies, calibration algorithms are fundamental for the correct estimation of blood glucose. Current algorithms are based on linear regression techniques where the dynamic information between different biological compartments is ignored and this may cause high estimation errors. It is precisely the

magnitude of the error that caused the continuous glucose monitoring to be considered today as a tool to complement and not replace capillary measurement," adds Jorge Bondia.

The method developed by the Spanish labs reduces these estimation errors. It consists of an algorithm based on a set of trained estimators using data from a representative population of patients. "Our goal with this project is to help continuous glucose monitoring to cease to be complementary to capillary measurement," says the researcher. The team has validated this new technology in clinical studies.

More information: Rico, B. et al. Adaptive calibration algorithm for plasma glucose estimation in continuous glucose monitoring. *Biomedical and Health Informatics*. DOI: 10.1109/JBHI.2013.2253325

Provided by Asociacion RUVID