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Personalized Short-term Blood Glucose Prediction in T1DM

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Background

The focus of the European project DiaAdvisor™ [3] is the development of a personalized tool providing diabetic patients with reliable and accurate near future blood glucose predictions in order to support the users in the insulin therapy decision-making tasks while letting them maintaining control over their own treatments management.

Data

8 T1DM subjects (5 MDI/3 CSII, 5 males/3 females, age = 45.25±13.53 years, disease duration = 22.37±11.81 years, BMI = 23.88±3.25, HbA1c = 8.27±0.90%) underwent a 3-days visit at the CIC in Montpellier, France, within the European research project DiaAdvisor™ [4]. Patients were served standardized meals for breakfast, lunch and dinner (carbohydrate content: 42.70, 70 [g], respectively) and decided insulin needs based on their personal HemoCue™ Glucose Analyzer outcomes. Blood samples were collected by nurses to measure plasma glucose concentrations: every hour during day, every 2 hours during night, 30 min before breakfast, 10, 20, 30, 60, 90, 120, 150, 180, 240, 300 min after breakfast and every 15 minutes after lunch and dinner for 2 hours, for a total of 37 blood samples per day.

Method

Cross validation showed prediction error standard deviation 14.19±8.45 [mg/dL], 26.22±15.04 [mg/dL], 31.59±19.41 [mg/dL] and 37.70±22.14 [mg/dL] on 30-, 60-, 90- and 120-minutes-ahead prediction, respectively.

Conclusions

The study provided reliable short-term glycemia predictions.

References


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