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FURTHER DEVELOPMENTS OF THE ENERGETIC FEEDBACK FOR AUTOMATED TREATMENT OF THE SEVERE ACUTE GLUCOSE METABOLISM DISORDER MONITORING (FIRST RESULTS)

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Background: Previous investigations have proved that the use of differential temperature evolution as "energetic" feedback for monitoring the insulin treatment of severe hyperglycaemia, was not worse and may be better than the classical schema, independently on the pathology leading to this glucose metabolism disorder. Nevertheless some cases of hypoglycaemia were still recorded.

Aim: The present work was to elaborate, and to test in experiments (and clinics?) a device which will be able to preview and correct the hypoglycaemia development.

Material and methods: For the device elaboration with digital thermic sensors for body deep and superficial temperature registration, Atmel AVR processor, TFT touch screen and injection pumps for insulin and glucose automated injection were used. The device was tested in observation and treatment regimens in 30 rats, 5 informed healthy volunteers and 10 informed patients. During the procedures body and room temperatures were registered by the device and usual thermometer, peripheral glycaemia was measured by strips (One Touch, Switzerland).

Results: In observation regimen, the device was able to detect temperature events predicting a hypoglycaemia in animals and glucose metabolism disorder in humans. In treatment regimen in rats with Streptozotocin induced diabetes, a quick normalization of glycaemia could be reached by insulin injection, as well as a correction of temperature fall by glucose injection.

Conclusion: These first results have shown that it is possible to automate the treatment of severe acute glucose metabolism disorders by both insulin and glucose injection based on the evolution of body temperatures as a feedback. Further investigations are still necessary to confirm the device possibilities, particularly for chronic glucose disorders.

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Biography

Marc Martin was born on 02/09/1959 in Antwerp and Currently working as an Deputy chief medical services, CHU Brugmann, Brussels.

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