Beneficial effects of high insulin doses on cardiac function are used to treat patients with cardiogenic shock. Hyper-Insulinemia Euglycemia Therapy (HIET) = insulin infusions (1 U/kg/h) + exogenous glucose (max. 400 g/day). But…

- Clinical application of HIET is currently empirical.
- The hypoglycemic risk is high.
- Controlling insulin dosing can be very difficult as patient metabolism and insulin sensitivity are variable.

Hence…

Our work aims to develop a model-based protocol to optimize HIET interventions.

The model of the glucose-insulin system is adapted for HIET patients, especially the plasma insulin clearance. Data come from 5 patients treated with HIET in Liege University Hospital (Belgium).

Clinical data:
- Exogenous insulin input
- Blood glucose levels
- Enteral and parenteral nutrition
- Medication
- Plasma insulin concentration
- Urine insulin concentration

The adapted model better captures HIET patient behavior. After 10 hours of HIET, insulin clearance increases largely → normalization of plasma insulin concentration. Insulin is eliminated via the urine but possibly also stored. HIET becomes ineffective and should be stopped after 10 hours.

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