The VIPUN balloon catheter to quantify gastroprokinetic therapeutic gain

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VVKVM Vlaamse Vereniging voor Klinische Voeding en Metabolisme

Context

- Impaired gastric motility complicates enteral nutrition, often resulting in intolerance. For instance in the intensive care unit no technique exists to adequately monitor gastric motility.
- A novel nasogastric feeding catheter with an integrated intragastric balloon was developed and clinically tested. This device, the VIPUN balloon catheter, has a dual function. I: enteral access to administer nutrition and II: continuous measurement of gastric motility.
- The evaluation of gastroprokinetic agents (e.g. in critically ill patients) is difficult and often based on secondary endpoints.

Research aim

Demonstrate the potential of the VIPUN balloon catheter to quantify the efficacy of different gastroprokinetic agents in a critically ill patient model.

Planned activities (12 – 24 months)

- We have established a critically ill patient model in healthy subjects. Administration of both codeine and a proton pump inhibitor significantly impairs gastric motility and consequently gastric emptying rate.
- The effect of a gastroprokinetic agent (prucalopride) will be quantified with the VIPUN balloon catheter in a blinded, placebo- and sham-controlled, randomized crossover trial.
- Gastric emptying rate will be evaluated with a breath test (^{13}C-octanoate) and scintigraphy imaging.

Deliverables

- Demonstrate the feasibility and safety of the VIPUN balloon catheter as a tool to assess gastric motility and explore its effect on motility and empting as such.
- The effect of prucalopride on gastric motility and emptying.
- The correlation between gastric motility and emptying.

Resources & enablers

- Research personnel costs are covered by a national research grant (Research Foundation Flanders).
- The MNI grant would enable the use of scintigraphy (facilities, tracer and technical staff), balloon catheters, control unit, test products and the subject compensation.

What factors will make it successful?

- Confirmation of the correlation between gastric emptying and motility, as measured with the VIPUN balloon catheter, allows to omit the gastric emptying tests in further research.
- The VIPUN balloon catheter, a single affordable bedside tool, will become sufficient to investigate the efficacy of prokinetic therapies on gastric motility, as a surrogate for emptying and nutrient tolerance.

Results/outcomes & expected impact

- The availability of an affordable and accurate bedside tool to continuously assess gastric motility will enable to evaluate gastroprokinetic therapies.
- The VIPUN balloon catheter has the potential to replace the disputed, yet widely applied, practice of gastric residual volume aspiration in the prediction, evaluation and prevention of gastrointestinal intolerance.
- Monitoring of gastric (dys-)function can promote the adequate delivery of nutrients and can contribute to evidence-based guidelines to optimize nutrition in critically ill patients.
- The innovative VIPUN Gastric Monitoring system has the potential to become a widely available tool in research settings, as well as in daily clinical practice at the ICU and gastroenterology ward.

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Medical Nutrition International Industry