INSELSPITAL
UNIVERSITÄTSSPITAL BERN
BERN UNIVERSITY HOSPITAL

Department of Diabetes, Endocrinology, Nutritional Medicine and Metabolism (UDEM)

Master's Thesis Opportunity: Investigating the impact of GLP-1 receptor agonists on Gastric Emptying using Stable Isotopes

Background and Research Goal of the Thesis

Glucagon-like peptide-1 (GLP-1) receptor agonists (RAs) have a major, and increasing, impact on the current management of type 2 diabetes and obesity and are increasingly prescribed worldwide. While their benefits on glycaemic control and weight loss are well-established, their effects on gastric emptying remain poorly understood—particularly for long-acting formulation (e.g. semaglutide or Wegovy® once weekly). Impact on gastrointestinal motility can be beneficial, such as through attenuation of postprandial glycaemia and triglyceride levels. Conversely, altered motility may lead to potentially detrimental consequences, including retained gastric contents during endoscopy or general anaesthesia or poor tolerability. However, the literature presents conflicting data regarding GLP-1RA effects on gastric emptying, likely attributable to methodological limitations (particularly the widespread use of acetaminophen absorption tests), potential tachyphylaxis with prolonged therapy, and significant interindividual variability.

This master's thesis will address these knowledge gaps by **quantifying the effect of Wegovy® on gastric emptying using a stable isotope breath test (13C-acetate)**. Unlike scintigraphy, this radiation-free method tracks the oxidation of a labeled test meal via exhaled 13CO2, providing a dynamic and safe assessment of gastric motility. You will analyze data from a **subset of 30 participants with obesity and (pre)diabetes** in an ongoing trial, comparing gastric emptying before and after 3 months of treatment.

Tasks and Learning Outcomes

- Gain expertise in **stable isotope breath testing** for gastric emptying quantification.
- **Participate in human physiological experiment**s within an interdisciplinary team.
- Analyze a rich dataset using **mathematical modeling** and statistical tools (R/Matlab).
- Contribute to clinically relevant insights

Candidate Profile

We seek a motivated student with:

- Strong interest in **metabolic physiology** and clinical research.
- Curiosity about GLP-1RAs and their gastrointestinal motility effects.
- Enthusiasm for **human translational research** and collaborative teamwork.
- Basic proficiency in R or Matlab (or willingness to learn).

Contact details

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