INSELSPITAL
UNIVERSITÄTSSPITAL BERN
BERN UNIVERSITY HOSPITAL

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

Master's Thesis Opportunity: Assessing Estradiol Variability in Menopause Hormone Therapy

Background and Research Goal of the Thesis

Menopausal hormone therapy (MHT) is the first-line treatment for vasomotor symptoms, affecting 50–75% of women during menopause. Transdermal estradiol is preferred due to its avoidance of hepatic first-pass metabolism and reduced thromboembolism risk. However, significant inter- and intra-individual variability in estradiol levels exists, which is still poorly understood but would be important to optimize safety and efficacy of MHT. Bioanalytical challenges complicate exposure assessment, as conventional immunoassays lack the required sensitivity and specificity, underscoring the need for mass spectrometry-based methods.

The objective of this master thesis is to evaluate the intra- and between person variability in estrogen exposure (plasma estradiol, estrone and urinary estrone-3-glucuronide) in 20 postmenopausal women on stable 50 mcg transdermal estradiol (Estradot 50®, twice-weekly application). Estrogen exposure will be quantified using LC-MS/MS. Routine immunoassays available in clinical practice will be used in parallel. This project is an approved subinvestigation of an ongoing clinical trial (BASEC ID 2024-01882).

Tasks and Learning Outcomes

- Gain expertise in the clinical pharmacology of transdermal estradiol therapy and bioanalytical methods for the quantification of estrogen exposure.
- Contribute to specimen collection and collection of relevant clinical information in target population.
- Interact with an interdisciplinary research team and collaborating laboratories
- Analyze the acquired datsets for outcomes of interest (intra/between subject exposure variability, relationship with BMI, level of agreement between LC-MS/MS and routine immunoassay)

Candidate Profile

We seek a motivated student with:

- Strong interest in **endocrinology, pharmacokinetics, and women's health physiology**.
- Passionate about refining knowledge on **estradiol metabolism**
- Enthusiasm for **clinical research** and **collaborative teamwork**.
- Basic proficiency in R or Matlab (or willingness to learn).

Contact details

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