

Background

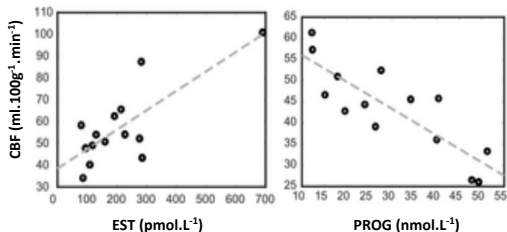


Figure 1. Relationship between estrogen (EST) and progesterone (PROG) on Cerebral Blood Flow.⁽¹⁾

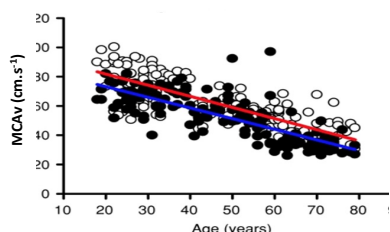


Figure 2. Age and middle cerebral artery velocity changes in trained (○) vs. sedentary (●) individuals.⁽²⁾

- Estrogen and progesterone regulate cerebral blood flow in females (Fig 1.).
- Lifelong brain health is associated with cerebral blood flow (CBF) and physical activity (PA) (Fig. 2)

Methods

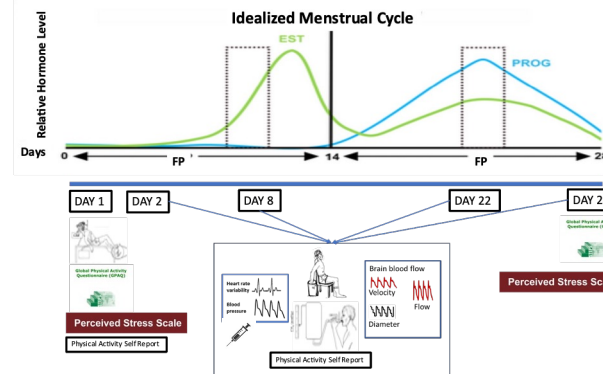


Figure 3. Timeline of physical activity, cerebral blood flow, and sex hormone data collection over 28 days.⁽¹⁾

This project is part of a larger PhD project focusing on sex hormone fluctuations and cerebrovascular health. Physical activity (PA) profiling was added as an additional measure for the VKURA project. The aim is to collect this data in 40 participants (20 females; 20 males) during a 1 month period. By measuring multiple time points we are able to investigate how high and low levels of estrogen and progesterone may impact cerebrovascular health and PA

Preliminary Results

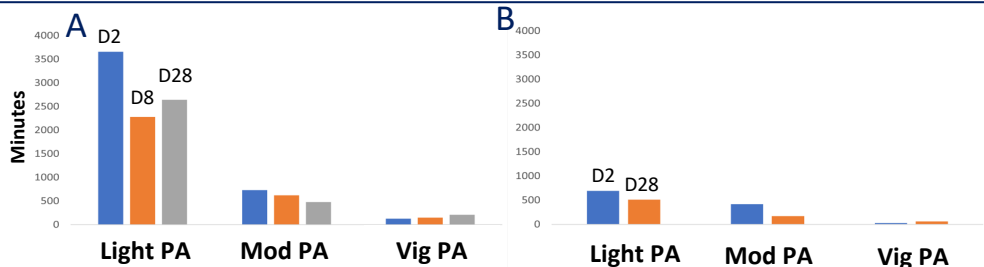


Figure 4. Self-reported PA days 2, 8, and 28 of a females menstrual cycle (Panel A) and on days 2 and 28 for the male participant (Panel B)

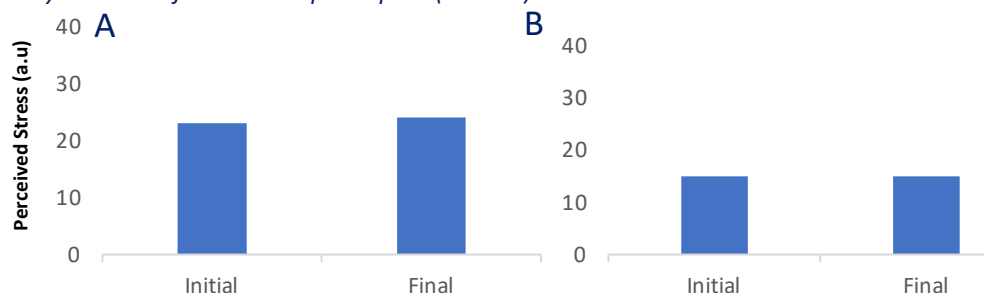
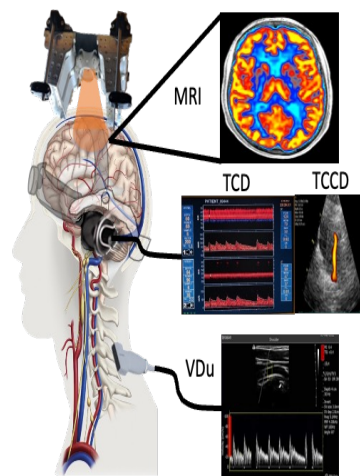


Figure 5. Perceived Stress Scale in a female (Panel A) and male (Panel B) participant from initial (cycle day 2) and final (cycle day 28) testing points.



Cerebrovascular and Sex Hormone Data In Progress

Discussion & Limitations

- Light and moderate Physical Activity was lower in the male compared to the female participant
- Light and Moderate physical activity had the largest fluctuations over the 28 days, regardless of sex.
- A total of 9 participants have completed the study as of the end of August.
- Commitment to the five visits was a major hurdle for subject recruitment over the summer months.
- Statistical Analysis to be completed later (Linear Mixed Modelling will be used).
- Sex hormone data and the complete Cerebral battery will not be analyzed until end of study

Learning Outcomes

- Gained experience with the amendments and submissions of ethics applications
- Engaged in participant recruitment and experience interacting with participants in the lab environment.
- Data collection including collection of the PA and PSS data.
- Expanded ability to read and interpret scientific literature.
- Data analysis utilizing established techniques for GPAQ and PSS in human participants.

References & Acknowledgements

1 Cote et al., (2021) Human Brain Mapping. <https://doi.org/10.1002/hbm.25646>
 2 Ainslie et al., (2008) J Physiol. 10.1113/jphysiol.2008.158279
 3 Cohen et al., (1983) APA PscyTests
 4 World Health Organization. (n.d) Global physical activity questionnaire (GPAQ).
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