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The CircaHealth study – CircaPain: An epidemiological study of the circadian control of biopsychosocial outcomes in chronic pain.

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Abstract

Approximately 20% of the Canadian population lives with chronic pain. 24-hour circadian rhythms regulate the function of our nervous and immune systems, which are both involved in the experience of pain. Being able to address pain rhythmicity on a molecular and psychosocial level might help in the treatment/management of chronic pain conditions. Our study CircaHealth - CircaPain uses an online survey to study the circadian control of chronic pain in the Canadian and international population.

Methods: Following a baseline questionnaire, blood samples are collected from participants two times a day within 12 hours for Complete Blood Count and qPCR to identify expression of specific clock genes and inflammatory cytokines throughout the day. Participants also complete a series of electronic symptom-tracking diaries (ecological momentary assessment), in which they rated their pain intensity, negative affect, and fatigue on a 0-10 scale at 3 timepoints (8:00AM, 2:00PM, 8:00PM) each day for 10 days.

Results: Our preliminary findings in the Kingston cohort suggest that circadian rhythmicity, on a molecular and biopsychosocial level, influences pain intensity and opioid use. Distinct patterns of pain rhythmicity are identified (e.g., constant, increasing, or decreasing throughout the day). Further analysis determined associations between these pain rhythmicity patterns and other variables, such as pain type, anxious and depressive symptoms, exercise, and sleep habits.

Discussion: We are now recruiting participants from across Canada and setting up multi-site collaborations in Canada and internationally to collect samples and create a biobank. This will help investigate how latitude might also have a role in affecting pain outcomes and molecular variables. This work will deepen our understanding of 24-hour pain fluctuations by uncovering distinct pain rhythmicity patterns and potential predictors for their occurrence. This may help to develop new treatments for different chronic pain conditions tailored to circadian rhythmicity, such as light therapy/chronotherapy for chronic pain.