

ABSTRACT

Estradiol and Daily Affective Experiences in Trauma-Exposed Women

by

Jenna K Rieder

Advisor: Mariann R Weierich PhD

People who experience trauma can develop enduring trauma-related symptoms. In daily life, post-trauma symptoms (e.g., elevated physiological arousal) can be triggered by affectively salient cues in the environment, especially by cues that act as trauma reminders. Trauma exposure is associated with enduring changes in two biological stress systems: the sympathetic nervous system (SNS) and the hypothalamic-pituitary-adrenal (HPA) axis. In women, activity in both systems is additionally modulated by fluctuations in levels of sex hormones (e.g., estradiol), which could influence physiological responses to trauma reminders. Additionally, previous work has linked the sex hormone estradiol with affect, suggesting that menstrual cycle might influence trauma-related symptoms or daily affect more broadly within the context of trauma exposure. However, we do not yet have a clear understanding of how estradiol influences affective experiences post-trauma.

We used a multi-method approach to examine the influence of estradiol on daily affective experiences in a non-clinical, trauma-exposed sample of 40 naturally cycling premenopausal women. The first specific goal of this study was to test the hypothesis that low estradiol would be related to trauma symptoms, including an asymmetrical profile of SNS and HPA axis stress reactivity to a naturalistic trauma reminder. Lower estradiol was related to greater number and severity of PTSD symptoms, and participants in low versus high estradiol menstrual cycle phases showed higher SNS and reduced HPA axis

reactivity to a trauma reminder. These results suggest that lower estradiol is associated with a less adaptive profile of stress system reactivity and increased PTSD symptom expression.

The second specific goal of this study was to test the influence of menstrual cycle phase on daily affect in a subset of 30 participants. We assessed affective experience over the course of a 10-day ecological momentary assessment (EMA) period, which included the early follicular (low estradiol) and late follicular (high estradiol) phases. We selected these menstrual cycle phases to capture a portion of the cycle where estradiol increased, whereas progesterone remained low, allowing us to test the effects of estradiol without the confound of progesterone. Participants reported more frequent aversive affective experiences, defined as negatively valenced, high arousal states, including PTSD symptoms, during the early versus late follicular phase. During the early versus late follicular phase, participants also reported greater negative and positive affect and showed greater variability in affective ratings. These results suggest that lower estradiol menstrual cycle phases are characterized by more frequent aversive affective experiences, greater affective lability and increased PTSD symptom severity.

Together, these results have potential implications for clinical assessment, as menstrual cycle phase at the time of assessment could influence diagnosis of PTSD or symptom severity. Additionally, clinicians working with women with PTSD might anticipate greater affective lability and increased symptom severity during low estradiol phases of the menstrual cycle.