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Ambulatory Assessment of Psychological and Psychoendocrinological Characteristics across the Menstrual Cycle in Women with Premenstrual Dysphoric Disorder

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Premenstrual Dysphoric Disorder (PMDD), outlined as a new diagnostic category in DSM-5, is characterized by key affective and accompanying psychological and physical symptoms during the premenstrual (late luteal) phase of the menstrual cycle, resulting in clinically significant distress and functional impairment. Despite its high prevalence (3%-8% in women of fertile age) and risk of chronic developments, psychological and biological mechanisms underlying PMDD are so far not well understood. Among other factors, a dysregulation of the stress axis is being discussed.
The present thesis integrates three substudies from a project using Ambulatory Assessment (AA) with electronic diaries (smartphones) to compare the course of mood, cognitions, and cortisol release in the daily life of women diagnosed with PMDD and healthy control women over the course of the menstrual cycle. AA took place at semi-random time points eight times a day during two consecutive days per cycle phase (menstrual, follicular, ovulatory, and late luteal). In particular, the thesis focused on identifying possible cycle-related within-person changes in affective, cognitive, and endocrinological states and their interrelations as captured in real time and real life. A clinical follow-up was conducted four months after baseline.
Study 1 examined the stress-related facets of mood, cognition and cortisol together with basal cortisol activity over the menstrual cycle in women suffering from PMDD and asymptomatic controls. Findings revealed that affected women showed increased subjective stress appraisal and enhanced high arousal negative affect towards daily life stressors particularly in the late luteal phase of the menstrual cycle. Furthermore, PMDD was associated with blunted basal activity of the hypothalamic-pituitary adrenal axis (delayed cortisol awakening response peak, flatter daily cortisol slope) and reduced cortisol reactivity toward periods of enhanced rumination irrespective of menstrual cycle phase. This study revealed substantial cycle-related intraindividual variability in stress appraisal and psychological responses to stress together with blunted basal cortisol activity in PMDD, with the latter similarly observed in other stress-related disorders.
Study 2 focused on menstrual cycle-related variations in momentary cognitive and affective daily life states as well as on their time-lagged reciprocal effects in women with PMDD and controls. PMDD women, in contrast to controls, showed higher levels of momentary negative affect and rumination, and lower levels of positive affect and self-acceptance toward the end of the menstrual cycle. Lagged analyses showed stronger reciprocal within-person effects of cognitions and mood in PMDD women, whereby the effect of rumination on subsequent negative affect was limited to the late luteal phase. Stronger prospective associations of daily life cognitions and affective states in PMDD suggests that affected women seem to be more sensitive to detrimental effects of either dimension in a kind of vicious cycle. The study emphasizes the role of cognitions in the context of PMDD suggesting that ruminative thinking might be an important therapeutic target.
Study 3 investigated whether AA-characteristics of momentary mood, cognitions, and cortisol, measured across the menstrual cycle at baseline, would predict the four-month clinical symptom course in women with PMDD. Levels of momentary negative and positive affect, rumination, cortisol, and ruminative stress-reactivity improved the prediction of clinical PMDD symptomatology at follow-up after controlling for relevant demographic and clinical risk factors. High negative affect and low cortisol output independently predicted higher PMDD symptom scores and explained more than 15% incremental outcome variance. The identified substantial added value of individual AA-predictors points to the importance to consider such AA-derived phenotypes more systematically in future longitudinal PMDD research.

In conclusion, with the application of electronic AA the three studies add to existing knowledge on cycle-related variations in daily life affect, cognitions, and stress hormone release, and their temporal within-person associations in women with PMDD. Moreover, the combination of AA data at the micro-level of daily life experiences with longitudinal data at the macro-level of clinical symptomatology confirmed predictive validity of AA-derived phenotypes for the clinical course of PMDD. Findings may provide a starting point for future intervention research to provide respective evidence-based therapeutic strategies for affected women.