

Epidemic of Subclinical Ovulatory Disturbances During SARS-COV2 Pandemic—an Experiment of Nature

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During the SARS-COV2 pandemic (COVID-19) many studies have examined changes in women's stress, depression/anxiety, reproduction, plus post-vaccination cycle/flow changes¹. Although there are retrospective basal temperature data², we lack menstrual cycle and ovulation information during the pandemic. This analysis compared two independent, similar-design, convenience/community-based, single-cycle cohort studies 13 years apart: Menstruation Ovulation Study (MOS³, n=301, 2007-8) and MOS2 (n=112) during the pandemic. With MOS as a control, and given evidence subclinical ovulatory disturbances (SOD; short luteal phase/anovulatory menstrual cycles of normal lengths) occur before changed cycle lengths^{4,5}, we hypothesized MOS2 would have increased SOD but similar cycle lengths as MOS.

Methods: In both studies, recruitment of menstruating women ages 19-35 years, not using systemic or combined hormonal contraceptives (CHC) used posters/ebcasts/social media. In MOS, ovulation was assessed by 3-fold increased follicular (FP)-to-luteal (LP/premenstrual) urinary progesterone (PdG); in MOS2, by validated Quantitative Basal Temperature© (QBT)^{6,7} (normal LP=10+ days). We performed the same interviewer-administered (CaMos©) questionnaire for demographics, SES, and reproduction, measured anthropomorphic variables, plus collected daily Menstrual Cycle Diary © (Diary) for all. FP and LP/premenstrual PdG or salivary progesterone (Ps) samples were respectively collected. Participants in MOS2 were not different from MOS in: average age 29, menarche age 12.5, BMI 24, living situation and education (≥75% university graduates). Cohorts also differed: MOS2 women were less likely to be White (56% vs 76%), work fulltime, ever use CHC (68% vs 79%) or to be parous (8% vs 20%); they were younger at starting CHC (17.9 vs 18.6 years).

Results: MOS2 and MOS had similar cycle (30.3 vs 29.9 days, P =.306) and flow lengths (median 6.0 days; P=.055). MOS2 recorded significantly more SOD cycles (>50% anovulatory) vs MOS³ (63% vs 10%; P<.001). MOS2 Diary analyses by Principal Components Analysis showed significantly increased anxiety/depression/frustration (negative moods) and “outside stresses” plus sleep problems and headaches vs MOS (all P<.001).

Discussion: This is the first evidence that ovulatory disturbances without cycle length changes may be associated with the multidimensional stresses women experience during the pandemic. Increased SOD may also relate to greater nulliparity, younger CHC teen use and more non-White women in MOS2, as well higher prevalence of negative moods, outside stresses and sleep problems. Salivary progesterone, cortisol and estradiol levels remain pending. Prevalent SOD cycles, if persistent/recurrent, risk increased infertility, bone loss⁵, early heart attacks, and breast and endometrial cancers⁸. In this ‘experiment of nature,’ the pandemic was associated with disturbed ovulation rather than menstrual cycles.

¹Edelman AB *Ob Gyn*2022; ²Nguyen JK *PLOS ONE*2021; ³Prior JC *IJERPH*2018; ⁴Prior JC *NEJM*1990; ⁵Li D *Epidiol Rev* 2014; ⁶Prior JC *Clin Invest. Med*1990; ⁷Bedford JL *Eur J ObGyn Reprod Biol*2009; ⁸Prior JC *DDDM* 2020.

Presentation Type: Oral Session

Presentation Date: Sunday, June 12

Presentation Time: 11 AM-12:30 PM

Location: B404