Irregular Menstruation among Women is Associated with COVID-19 Infection, but not Vaccination

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STAR Study of Treatment and Reproductive Outcomes

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BACKGROUND

Women reported increased incidence of irregular menstruation during the COVID-19 pandemic. No research has evaluated irregular menstruation among women living with HIV during the COVID-19 pandemic, which is key to understanding reproductive health during co-infections.

METHODS

- **Dates:** 2021-2023
- **Study design:** Cross-sectional survey data and plasma samples were collected in the multi-site Study of Treatment and Reproductive Outcomes (STAR) cohort of reproductive-age women with and without HIV in the southern US.
- **Participants:** women living with HIV or at elevated risk for acquiring HIV, 18-45 years of age, without conditions/medications known to interfere with menses
- **Self-Report Survey Measures:**
  - Self-reported SARS-CoV-2, defined as any self-report of a positive COVID-19 test
  - COVID-19 vaccination (any vs. none)
  - Irregular menstruation in the past year (spotting, missed periods, early/late periods)
  - The Perceived Stress Scale
- **Antibody Testing:** Women in Atlanta and Miami had plasma tested for COVID-19 antibodies (*n* = 86); in this sub-sample, we defined "SARS-CoV-2 infection" as having detectable antibodies to nucleocapsid and/or self-report of a positive COVID-19 test in any setting.
- **Analysis:** We examined irregular menstruation by self-reported vaccination and by self-reported and antibody-confirmed SARS-CoV-2 infection stratified by HIV status.

SAMPLE DESCRIPTION

Table 1.	Overall Sample	Antibody Sub-Sample
N	188	86
Mean age	36	36
Most Common Race/Ethnicity	73% Non-Latina Black; 5% Latina White	72% Non-Latina Black, 8% Latina White
Living with HIV	61%	51%

Irregular menstruation was associated with **COVID-19 infection, stress, and age** among women without HIV, but not among women with HIV.

RESULTS

- 49% had irregular menstruation
  - 22% skipped periods, 35% late/early periods, 18% spotting
- No differences in irregular menstruation, vaccination (58% of overall sample), or prior SARS-CoV-2 (69% of sub-sample with antibodies) by HIV status.
- **Women without HIV**
  - Among the survey sample, irregular menstruation was associated with lower age (32 vs. 35) and higher perceived stress (17 vs. 13) (**Table 2**).
  - Irregular menstruation was more common in women with self-reported SARS-CoV-2 (70% with irregular menstruation) versus women without a self-reported positive test (43% with irregular menstruation) (**Figure 1**).
    - In the antibody testing sample, irregular menstruation was more common among women with prior SARS-CoV-2 (61% with irregular menstruation) versus without SARS-CoV-2 (27% with irregular menstruation) **(Figure 1)**
  - IM was not associated with vaccination, BMI, race, or ethnicity.
    - Women with just vaccination had the lowest rate of irregular menses (17%)
- **Women with HIV:** No variables were associated with irregular menstruation.

Table 2. Age and Stress in Women without HIV were Associated with Irregular Menstruation

	Women with HIV (*n* = 115)			Women without HIV (*n* = 73)		
	Regular Menses (*n* = 62) 54%	Irregular Menses (*n* = 53, 46%)	*P*	Regular Menses (*n* = 34, 46%)	Irregular Menses (*n* = 39, 53%)	*P*
	M (*SD*)	*M* (*SD*)		*M* (*SD*)	*M* (*SD*)	
Age	38 (6)	36 (6)	0.167	35 (7) ↑	32 (7)	0.036*
Perceived Stress	14 (7)	15 (7)	0.486	13 (8)	17 (8) ↑	0.040*

*Significant at p < .05

CONCLUSIONS

Irregular menstruation occurred in half of women during the COVID-19 pandemic. Among women without HIV, irregular menstruation was more common among women with prior SARS-CoV-2 compared to women without SARS-CoV-2. No association was found between menstruation and vaccination. Research is needed to identify mechanisms underlying irregular menstruation, including stress and infection, and to identify unique contributors to menstrual irregularities in women with HIV. Women should be made aware that irregular menses may be more common because of the pandemic. Women practicing fertility awareness to prevent or identify pregnancy should be encouraged to use additional contraceptive and pregnancy testing methods in the context of irregular menses.

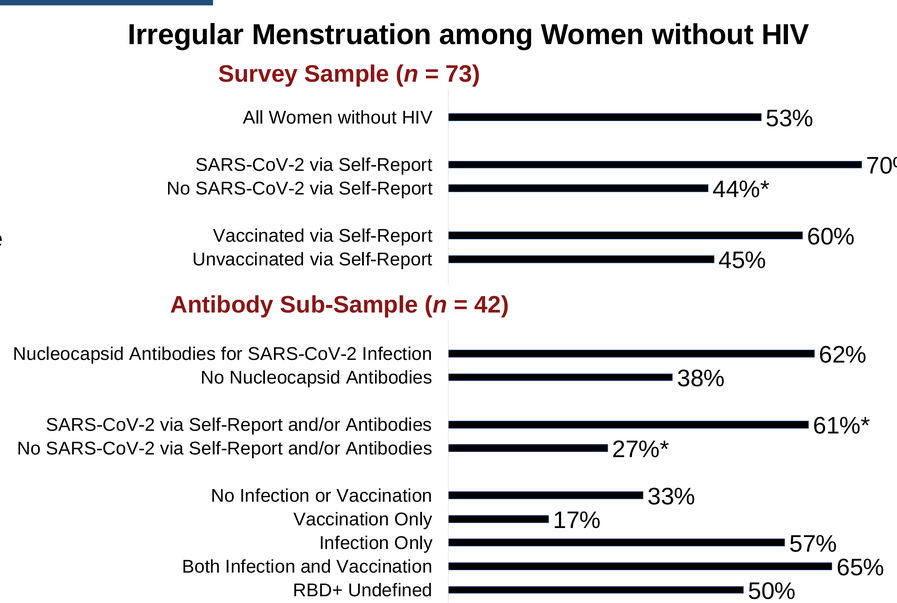


Figure 1. Rates of irregular menstruation among women without HIV for each COVID-19 variable. Rates of irregular menstruation were significantly higher among women who self-reported testing positive for COVID-19 and who had SARS-CoV-2 by either self-report and/or the presence of antibodies to nucleocapsid. *p < .05

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