

Exploring the Impact of Sleep and Circadian Rhythm on Ovarian Reserve Markers and Stimulation Response in Reproductive-age Women Undergoing Elective Oocyte Cryopreservation

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Background

- Sleep quality and circadian preference have been implicated in metabolic and endocrine function^{1,2}.
- Their role in reproductive aging and ovarian reserve remain poorly understood.

Research Objectives

To evaluate how sleep quality and chronotype influence ovarian reserve and oocyte yield in women undergoing elective oocyte cryopreservation

Methods

- Single academic fertility center
- **Prospective cohort** with women undergoing elective oocyte cryopreservation
- Pittsburgh Sleep Quality Index (**PSQI**) and Morningness-Eveningness Questionnaire (**MEQ**)
- Ovarian reserve (**AMH, AFC**) and **oocyte yield**

→ Poor sleep quality & morning chronotype were independently associated with ↓ **AMH and AFC.**

→ **Ovarian response to stimulation may remain relatively preserved despite diminished baseline reserve.**

Results

- 36 participants completed PQSI → 39% had poor sleep quality (PSQI>5).
- 43 participants completed MEQ → normal distribution of chronotypes (mean 45.4 ± 4.5).
- **Poor sleep quality** ($\beta = -2.14$, $p = 0.003$) and a **more morning oriented chronotype** ($\beta = -0.27$, $p = 0.001$) → associated with ↓ **AMH.**
- **Poor sleep quality** → associated with ↓ **AFC** ($\beta = -7.94$, $p = 0.035$).
- When stratified by sleep quality (PSQI ≥5 vs <5), the **mean AMH** (2.46 vs. 3.78ng/mL, $p=0.10$) and **AFC** (median 13 vs. 22.5, $p = 0.017$) **were lower in poor sleepers.**
- Poor sleep quality ($\beta = -5.22$, $p = 0.052$) and morning chronotype ($\beta = -0.73$, $p = 0.016$) were **associated with fewer mature oocytes retrieved**, the overall model did not reach statistical significance ($p = 0.057$).

References

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2. Sato T, Sato S. Circadian Regulation of Metabolism: Commitment to Health and Diseases. *Endocrinology*. Jun 6 2023;164(7)doi:10.1210/endo/bqad086