

January Study of the Month

8-hour Time-Restricted Feeding Improves Endocrine and Metabolic Profiles in Anovulatory PCOS

Summary by Miyah Lampe, 3rd year CCNM student

Introduction: Polycystic ovarian syndrome (PCOS) is a common reproductive and metabolic disorder that affects women. 60% of women with PCOS are found to be overweight and this is thought to play a role in the disease process; as such, diet and exercise treatment protocols are recommended as first-line management in these patients. The goal of this study was to investigate the effects of time-restricted feeding (TRF) on women with PCOS.

Study Design: Non-randomized, uncontrolled trial that was approved by the Medical Research and New Technology Ethics Committee of Shengjing Hospital of China Medical University.

Population: 18 participants (18-40 years old) with a BMI $\geq 24\text{kg/m}^2$, anovulation and a PCOS diagnosis. The *exclusion* criteria for these participants were: certain medications and pre-existing medical conditions, recent weight fluctuation, pregnant/lactating, perimenopausal, night-shift workers, fasting > 16 hrs/day, hypotension, alcohol intake $> 100\text{mg/day}$, smoking and certain forms of exercise.

Intervention: Participants were followed over a one-week baseline period before beginning five weeks of TRF. During the TRF periods, participants ate freely from 8am-4pm then fasted between 4pm-8am; their diet composition was unchanged during this time.

Outcome Measures: Body composition was assessed using BMI, body fat mass (BFM), body fat percentage (BF%), visceral fat area (VFA) and a few other measurements. The metabolic parameters assessed were fasting glucose (FG) and insulin (FINS), area under the curve for insulin (AUCIns) and glucose (AUCGlu), homeostasis model assessment-insulin resistance (HOMA-IR) and certain lipid and cholesterol measurements. The menstruation and gonadal parameters assessed were: total testosterone (TT), sex hormone binding globulin (SHBG), free androgen index (FAI), luteinizing (LH) and follicular stimulating hormone (FSH). Other parameters that were assessed were hs-CRP, IGF-1, uric acid (UA), liver enzymes and eating behaviours via TFEQ-R21 questionnaire.

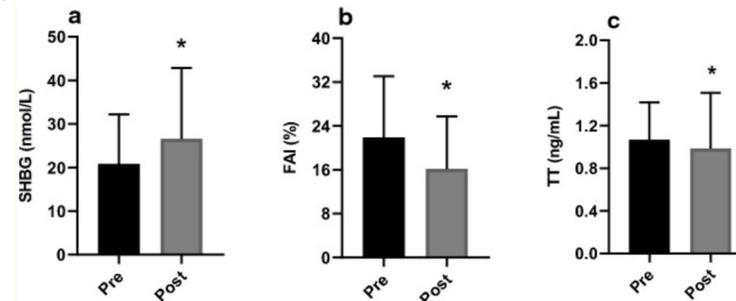


Fig 1: Pre- and post-TRF levels of: androgen-related variables. SHBG: sex hormone binding globulin, FAI: free androgen index and TT: total testosterone.

Results: After TFR, 73.3% of participants had improvements in their menstrual cycles. These body composition results were significantly decreased: body weight ($p < 0.001$), BMI ($p < 0.001$), BFM ($p < 0.001$), BF% ($p = 0.012$) and VFA ($p = 0.015$). The following metabolic parameters were significantly decreased: FINS ($p = 0.017$), AUCIns ($p = 0.007$), and HOMA-IR ($p < 0.001$). The following gonadal parameters were significant: decreased TT ($p = 0.048$), increased SHBG ($p < 0.001$) and decreased FAI ($p < 0.001$).

Discussion: People's health is more than a combination of test results and medications. The focus on diet and other lifestyle factors is increasing as is the body of research that supports these ideas. This was the first study to investigate the effects of TRF in PCOS patients on body composition and other parameters. Researchers found that 8-hour TRF may be associated with improved menstruation, hyperandrogenemia, decreased weight, decreased insulin resistance and chronic inflammation in women suffering from PCOS. The limitations of this study, mainly its lack of randomization and control but also its duration, provide a starting point for future studies in this field.

More investigations on what, as well as when, people eat and how this affects their health are needed. For example, would TRF and the elimination of dairy from the diet further decrease symptom severity? Is there an association between PCOS patients and increased food sensitivities and would eliminating these foods from the diet decrease symptom severity?

Reference: Li C, Xing C, Zhang J, Zhao H, Shi W, He B. Eight-hour time-restricted feeding improves endocrine and metabolic profiles in women with anovulatory polycystic ovary syndrome. *J Transl Med.* 2021;19(1):148. Published 2021 Apr 13. doi:10.1186/s12967-021-02817-2

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