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23 UNDERGRADUATE RESEARCH CRITIQUE

Research Critique on "Effects of Time-Restricted Feeding in Weight Loss, Metabolic Syndrome and Cardiovascular Risk in Obese Women"

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ABSTRACT

Introduction: Obesity has become a serious health concern due to its related comorbidities including metabolic syndrome (MetS), type 2 diabetes, and cardiovascular diseases (CVD). MetS is defined as having at least 3 of the 5 cardiometabolic risk factors including hypertension (systolic blood pressure [SBP] and/or diastolic blood pressure [DBP]), high triglycerides, low HDL-cholesterol, visceral obesity (waist circumference [WC]), and insulin resistance (IR). Time-restricted feeding (TRF) is the process of periods no caloric intake followed by periods of eating with no caloric restrictions. TRF has been studied as a potential weight-loss intervention; however, it is not clear how TRF could deliver beneficial effects on risk reduction of MetS and CVD.

Purpose: Schroder et al. aimed to determine the effect of TRF on body composition and the relationship between weight loss and metabolic and cardiovascular risk in middle-aged obese women.

Methods: Obese women (age 35-45 years, n=32) participated in a non-randomized control trail (NRCT) of TRF for 3 months. The TRF group (n=20, body mass index [BMI] 32.5±1.1 kg/m^2) adopted a regimen of 16 hours without caloric intake and 8 hours of usual caloric intake. The control group (n=12, BMI 34.6±1.2 kg/m^2) continued their normal eating habits for 3 months. Anthropometric measurements (BMI and WC), body composition (prediction equations validated by the NHNES), blood pressure, various blood biomarkers including fasting glucose and insulin, 30-year cardiovascular risk evaluation using the Framingham Heart Study in 30 years (CVDRisk30y), and quality of life (WHOQOL questionnaire) were evaluated before and after the intervention.

Results: Both groups were similar in age, BMI, fat mass, WC, IR, and SBP & DBP, while CVDRisk30y was greater in TRF vs. control (32.1±7.3 vs. 15.6±1.8 %, p<0.001). After the 3 months of intervention, there was a ~12% reduction in CVD risk as measured by the CVDRisk30y in the TRF group (pre 15.6±1.8 vs. post

13.8±1.8%), while the control group remained the same. The reduction of the risk score is accompanied with enhancement of body composition including reduction in body weight, BMI, percent body fat and WC. There was also an increase in quality of life in the TRF group after the 3 months. However even in the TRF group, there was no significant change in the blood biomarkers that are associated with MetS.

Conclusion: The study found that TRF was effective in weight loss, however, there was no significant change in the blood biomarkers that are associated with MetS.

Critique: Despite that the study suggested promising data on TRF as a critical treatment strategy for MetS and CVD, several limitations should be highlighted. Frist, this study was a NRCT thus did not control for potential recruitment/selection biases. Participants could already be a part of a weight loss program, have gained or lost weight recently, or have a predetermined outlook on diet and weight loss. The study did not consider how such biases would affect the results. The control group was informed that they were involved in a diet habit research which may have influenced their 'normal' pattern of eating. Participants also did not track their caloric intake as people's patterns of eating may be drastically different when it comes to amount consumed and meal frequency. This makes it unclear whether the weight loss achieved from the TRF group was from the time restriction itself or from a deficit in caloric intake. Second, as the primary outcome of the study was weight reduction, weight specific QOL (such as OWLQOL) can be used to project TRF effects, rather than using general QOL questionnaire. Lastly, proper use of biomarkers is required in the present study. For instance, HOMA-IR which was analyzed in the present study as an indicator of IR may not be sensitive enough (compared with Triglyceride to HDL ratio) to observe clinical/meaningful difference before and after the 3 months of intervention. Triglyceride to HDL ratio has been accepted as an indirect indicator of IR and it may be responsible to diet intervention. Given that the present study provided potential/preliminary evidence of TRF effects on MetS and CVD, further study with more comprehensive exanimation of the risk factors (i.e., hormone profiles indicating inflammatory response and glycemic control, and preclinical markers of CVD such as pulse wave velocity and intima-media thickness) is warranted.

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