

The effects of Ramadan fasting on energy expenditure in healthy non-obese individuals

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Introduction

Ramadan fasting affects hormonal environment and circadian rhythms; it is unclear whether these are accompanied by changes in energy metabolism. We have investigated the effect of Ramadan fasting on resting metabolic rate (RMR), activity energy expenditure (AEE) and total energy expenditure (TEE).

Methods Healthy non-obese volunteers (n=7, male : female = 3:4, age=27.9 ± 6.6 years) fasting during Ramadan were recruited from staff working at the Imperial College London Diabetes Centre. Measurements were performed during and after Ramadan. RMR was measured following nine hours of fasting using indirect calorimetry. AEE was measured using the fitbit One accelerometer; TEE was measured using doubly labelled water and body composition was estimated using bio-impedance technique.

Results No significant difference in mean RMR (1389.6 ± 212.5 kcal/day v 1311.7 ± 185.0 kcal/day, total calories burned measured by Fitbit One (2098.2 ± 296.2 kcal/day v 2018.3 ± 346.4 kcal/day) or TEE (2066.9 ± 428.1 kcal/day v 2174.1 ± 516.0 kcal/day) was observed between the Ramadan and post-Ramadan periods. Weight (71.6 ± 12.4 kg v 70.6 ± 12.7 kg), fat mass (23.2 ± 7.3 kg v 22.4 ± 7.7 kg) and fat free mass (48.8 ± 11.1 kg v 48.8 ± 10.6 kg) were similarly unchanged between the two periods.

Conclusions In the healthy population studied, no overall change in RMR and TEE was seen with Ramadan fasting. Differences in diet and activity are likely to be more important contributors to weight change with Ramadan fasting.