

Ramadan fasting is associated with a significant reduction in Resting Metabolic Rate in the first week

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Background: Ramadan fasting causes a major shift in meal times and patterns and is often accompanied by weight changes. However, no major changes are found in Resting Metabolic Rate (RMR) and Total Energy Expenditure (TEE).

Objective: We have investigated the impact of Ramadan fasting on RMR measured during the first and second week of Ramadan and compared it to pre- and post-Ramadan measurements.

Design: Healthy volunteers ($n=10$, n female= 6; Age= 35.9 ± 6.2 years; BMI= 28.0 ± 5.8 kg/m²) had RMR measurements one week before the start of Ramadan, during the first and second week of Ramadan and after Ramadan (washout period of 97.5 ± 40.3 days). RMR was measured after a minimum of 5 hours from previous meal using indirect calorimetry.. Non-parametric tests were used for comparative statistics.

Results: In comparison to the pre-Ramadan value (1535.6 ± 278.1 kcal/day), there was a significant drop in RMR in the first week of Ramadan (1438.2 ± 272.4 kcal/day; P value=0.008) which remained significant after Ramadan (1434.8 ± 262.4 kcal/day; P value=0.014). However, the change in RMR at second week (1474.7 ± 251.5 kcal/day) was not statistically different from the pre-Ramadan value (1535.6 ± 278.1 kcal/day; P value=0.100) and post-Ramadan value (1434.8 ± 262.4 kcal/day; P -value=0.297).

Conclusions: In contrast to starvation which is associated with an early epinephrine-driven rise in RMR, Ramadan fasting is accompanied with a significant drop in RMR in the first week of the fast. This highlights physiological differences between Ramadan-type intermittent fasting and other forms of dietary restriction.