Fasting during Ramadan and Associated Changes in Glycaemia, Caloric Intake and Body Composition with Gender Differences in Singapore

Ester CK Yeoh, 1 MBBS (Singapore), MRCP (UK), FAMS (Endocrinology), Sueziani Binte Zainudin, 2 MBBS (Singapore), MRCP (UK), MRCPS (Glasgow), Win Nie Loh, 3 Master of Nutrition and Dietetics (Aust), Chin Lian Chua, 1 Dip (Nursing), Master of Health Science (Management), Sharon Fun, 1 Master of Nursing, Tavintharan Subramaniam, 1 MBBS (Singapore), MRCP (UK), FAMS (Endocrinology), Chee Fang Sum, 1 MBBS (Singapore), FAMS (Endocrinology), FRCP (Edinburgh), Su Chi Lim, 1 MBBS (Singapore), MRCP (UK), FAMS (Endocrinology)

Abstract

Introduction: Millions of Muslim patients with diabetes mellitus (DM) fast during Ramadan. However, little is known about the metabolic impact of Ramadan fasting. We aimed to study the changes in body composition and metabolic profile in this group of patients.

Materials and Methods: We studied 29 Southeast Asian Muslim patients with type 2 diabetes; all underwent pre-Ramadan education. Study variables were weight change, body composition (using multifrequency bioimpedance method, InBody S20®, Biospace, South Korea), blood pressure (BP), glycated haemoglobin (HbA1c), fasting lipid profile, and caloric intake assessment using FoodWorks® nutrient analysis software.

Results: Twenty-three subjects fasted ≥15 days; mean ± SD: 57 ± 11 years; 52% were males. HbA1c improved significantly (8.6 ± 2.4% pre-Ramadan vs 8.0 ± 2.3% end-Ramadan, \( P = 0.017 \)). Despite similar body weight, there was reduction in body fat mass (BFM) (30.9 ± 11 kg vs 29.2 ± 12.2 kg, \( P = 0.013 \)). Multivariate analysis suggested that the reduction in HbA1c was attributed by reduction in BFM (\( \beta = -0.196, P = 0.034 \)). There was no change in visceral adiposity (visceral fat area (VFA)) but stratification by gender showed a reduction amongst females (137.6 ± 24.5 cm² to 132.5 ± 25.7 cm², \( P = 0.017 \)). These changes occurred despite similar total caloric intake (1473.9 ± 565.4 kcal vs 1473.1 ± 460.4 kcal, \( P = 0.995 \)), and proportion of carbohydrate (55.4 ± 6.3% vs 53.3 ± 7.5%, \( P = 0.25 \)) and protein intake (17.6 ± 4.1% vs 17.3 ± 5.4%, \( P = 0.792 \)), before and during Ramadan respectively, but with increased proportion of fat intake (11.9 ± 2.4% vs 13 ± 11.7%, \( P = 0.04 \)). Seven out of 23 patients had medications adjusted to avert symptomatic hypoglycaemia but none of the patients developed severe hypoglycaemia.

Conclusion: Ramadan fasting can be practiced safely with prior patient education and medication adjustment. It also confers modest benefits on metabolic profile and body composition, especially among females.

Ann Acad Med Singapore 2015;44:202-6

Key words: Diabetes, Education, Muslims