ABSTRAK

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Latar Belakang: Puasa Ramadhan merupakan bentuk *time-restricted eating* yang ditandai dengan perubahan pola makan, waktu konsumsi, dan ritme sirkadian. Respons terhadap puasa menunjukkan hasil yang beragam akibat beberapa faktor, salah satunya seperti genetik. Gen *melanocortin-4 receptor* (*MC4R*) berperan penting dalam regulasi asupan makan dan homeostasis energi. Salah satu *single nucleotide variant* (SNV) rs17782313, diketahui berasosiasi dengan peningkatan indeks massa tubuh dan risiko obesitas, terutama pada pembawa minor alel C. Penelitian ini bertujuan untuk mengetahui dampak puasa Ramadhan terhadap status gizi berdasarkan SNV rs17782313 gen *MC4R*.

Metode: Analisis dilakukan dengan model genetik dominan (TC+CC vs TT), sehingga 35 partisipan dikelompokkan dalam kelompok TT (n=15) dan TC+CC (n=20). Pengukuran antropometri, komposisi tubuh, asupan makanan (SQ-FFQ), dan aktivitas fisik (IPAQ-SF) dilakukan satu minggu sebelum, selama dan dua minggu setelah Ramadhan. Data genetik SNV rs17782313 diperoleh dari penelitian sebelumnya. Analisis *Repeated Measures* ANOVA dengan kovariat asupan energi dan aktivitas fisik digunakan untuk mengevaluasi pengaruh genotip dan waktu.

Hasil: Kelompok TT secara umum menunjukkan perbedaan berat badan, IMT, lingkar panggul, dan lemak viseral yang bermakna pada ketiga titik waktu ($p<0,05$). Lingkar pinggang pada kelompok TT memiliki perbedaan yang bermakna saat dan setelah puasa ($p=0,042$ dan $p=0,045$), sedangkan BMR menunjukkan perbedaan yang bermakna sebelum puasa ($p=0,045$). Interaksi waktu tiga kali pengambilan data dengan aktivitas fisik terhadap berat badan signifikan ($p=0,041$).

Kesimpulan: Puasa Ramadhan berdampak terhadap perubahan status gizi berdasarkan SNV rs17782313 gen *MC4R* pada populasi dewasa di Kota Semarang. Kedua kelompok genotip mengalami penurunan parameter antropometri selama puasa yang kemudian cenderung meningkat kembali setelah puasa dengan besaran respons yang berbeda, menunjukkan bahwa perubahan status gizi dipengaruhi oleh variasi genetik serta asupan energi dan aktivitas fisik.

Kata kunci: Puasa Ramadhan, SNV rs17782313 Gen *MC4R*, Antropometri, Komposisi Tubuh, Asupan Energi, Aktivitas Fisik.

ABSTRACT

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Background: *Ramadan fasting is a form of time-restricted eating characterized by changes in meal patterns, timing of food intake, and circadian rhythm. Responses to fasting vary and may be influenced by several factors, including genetic variation. The melanocortin-4 receptor (MC4R) gene plays an important role in the regulation of food intake and energy homeostasis. One single nucleotide variant (SNV), rs17782313, has been associated with increased body mass index and obesity risk, particularly among carriers of the minor C allele. This study aimed to examine the impact of Ramadan fasting on nutritional status based on the MC4R rs17782313 variant.*

Methods: *A dominant genetic model was applied, and 35 participants were classified into the TT group (n=15) and the TC+CC group (n=20). Anthropometric measurements, body composition, dietary intake (SQ-FFQ), and physical activity (IPAQ-SF) were assessed one week before, during, and two weeks after Ramadan. Genetic data for the rs17782313 variant were obtained from a previous study. Repeated Measures ANOVA with energy intake and physical activity as covariates was used to evaluate the effects of genotype and time.*

Results: *The TT group generally showed significantly higher body weight, BMI, hip circumference, and visceral fat across the three time points ($p<0.05$). Waist circumference in the TT group differed significantly during and after fasting ($p=0.042$ and $p=0.045$), whereas BMR showed a significant difference before fasting ($p=0.045$). A significant interaction was observed between the three measurement time points and physical activity on body weight ($p=0.041$).*

Conclusion: *Ramadan fasting was associated with changes in nutritional status based on the SNV rs17782313 of the MC4R gene in adults in Semarang. Both genotype groups showed decreases in anthropometric parameters during fasting followed by a tendency to increase after fasting with different magnitudes of response, indicating that changes in nutritional status are influenced by genetic variation as well as energy intake and physical activity.*

Keywords: *Ramadhan fasting, SNV rs17782313 MC4R Gene, Anthropomety, Body Compositions, Energy Intake, Physical Activity.*