ABSTRAK

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Latar Belakang: Obesitas merupakan masalah kesehatan yang dipengaruhi oleh faktor genetik, salah satunya adalah gen *MC4R* yang berperan dalam regulasi nafsu makan dan metabolisme. Varian rs17782313 pada gen ini telah dikaitkan dengan obesitas, namun belum banyak diteliti pada populasi etnis Jawa di Indonesia

Tujuan: Menganalisis interaksi antara varian gen *MC4R* (rs1778231 dengan kejadian obesitas pada populasi dewasa di etnis Jawa

Metode: Penelitian ini menggunakan desain *cross-sectional* dengan melibatkan 310 responden. Data yang dikumpulkan mencakup antropometri dan asupan makan. Analisis dilakukan menggunakan General Linear Model (GLM) untuk mengevaluasi hubungan dan interaksi antara varian gen *MC4R* rs17782313 dengan asupan makan dan parameter obesitas. Studi dilaksanakan pada Agustus hingga Desember 2024.

Hasil: Sebanyak 310 responden (49,7% pria; 50,3% wanita) memiliki rata-rata usia 34,72 tahun, dengan usia pria ($38,79 \pm 11,47$ tahun) lebih tinggi dibandingkan wanita ($30,71 \pm 11,00$ tahun). Rata-rata IMT sebesar 27,28 kg/m² (kategori overweight), lebih tinggi pada pria. Genotipe *MC4R* rs17782313 didominasi TT (69,3%) dengan frekuensi alel risiko C sebesar 16%, dan distribusinya sesuai keseimbangan Hardy-Weinberg ($p = 0,667$). Tidak ditemukan hubungan signifikan antara varian ini dengan IMT($p = 0,775$), lingkar pinggang ($p = 0,764$), atau lingkar panggul($p = 0,891$), maupun interaksinya dengan asupan karbohidrat 0,179) dan energi ($p = 0,435$).

Kesimpulan: Varian gen *MC4R* rs17782313 tidak menunjukkan hubungan maupun interaksi yang signifikan dengan parameter obesitas serta asupan energi dan karbohidrat pada populasi dewasa etnis Jawa. Meskipun alel C dikenal sebagai alel risiko secara global, prevalensinya rendah dan tidak berkaitan secara bermakna dengan obesitas dalam studi ini.

Kata Kunci: Obesitas; rs17782313, interaksi gen-diet

ABSTRACT

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Background: Obesity is a health issue influenced by genetic factors, one of which is the *MC4R* gene, which plays a role in appetite regulation and metabolism. The rs17782313 variant of this gene has been associated with obesity, yet it remains understudied in the Javanese ethnic population in Indonesia.

Objective: To analyze the interaction between the *MC4R* gene variant rs17782313 and obesity in the adult Javanese population.

Methods: This study employed a cross-sectional design involving 310 respondents. Data collected included anthropometric measurements and dietary intake. A General Linear Model (GLM) analysis was conducted to assess the association and interaction between the *MC4R* rs17782313 gene variant with dietary intake and obesity parameters. The study was conducted from August to December 2024.

Results: A total of 310 respondents (49.7% male; 50.3% female) had a mean age of 34.72 years, with males being older on average (38.79 $\pm$ 11.47 years) than females (30.71 $\pm$ 11.00 years). The mean BMI was 27.28 kg/m², classified as overweight, with higher values observed in males. The *MC4R* rs17782313 genotype was predominantly TT (69.3%) with a risk allele C frequency of 16%, and the distribution was in Hardy-Weinberg equilibrium (p = 0.667). No significant associations were found between this variant and BMI (p = 0.775), waist circumference (p = 0.764), or hip circumference (p = 0.891), nor were there significant interactions with carbohydrate (p = 0.179) or energy intake (p = 0.435).

Conclusion: The *MC4R* rs17782313 variant showed no significant association or interaction with obesity parameters or energy and carbohydrate intake in the Javanese adult population. Although the C allele is considered a risk allele globally, its low prevalence in this population was not statistically linked to obesity.

Keywords: Obesity; rs17782313; gene-diet interaction