ABSTRAK

Metformin merupakan terapi lini pertama pada pasien Diabetes Melitus (DM) tipe 2. Efek farmakologis metformin terjadi di hepatosit dan memerlukan transporter *Organic Cation Transporter 1* (OCT1) yang dikodekan oleh gen *SLC22A1*. Gen *SLC22A1* bersifat polimorfik, salah satunya pada variasi rs594709, yang dilaporkan berhubungan dengan penurunan kadar HbA1c dan trigliserida yang lebih baik dibandingkan *wild type*. Namun, data mengenai variasi ini pada populasi Indonesia masih terbatas. Penelitian ini bertujuan untuk menganalisis hubungan variasi genetik *SLC22A1* rs594709 dengan kadar trigliserida pada pasien DM tipe 2 yang menjalani monoterapi metformin di Kabupaten Sleman. Penelitian ini merupakan studi observasional analitik dengan rancangan potong lintang. Sebanyak 60 subjek dipilih secara acak dari 10 puskesmas di Kabupaten Sleman. Analisis genotipe dilakukan menggunakan metode PCR T-ARMS dan hasilnya dibaca dengan UV transilluminator. Hubungan antara variasi rs594709 dan kadar trigliserida dianalisis menggunakan uji *chi-square* dan *odds ratio* dengan tingkat signifikansi $p<0,05$. Hasil penelitian menunjukkan distribusi genotipe rs594709 terdiri atas genotipe GG sebanyak 10 individu (16,7%) dan genotipe GA sebanyak 50 individu (83,3%), sedangkan genotipe AA tidak ditemukan. Frekuensi alel G sebesar 58,3% dan alel A sebesar 41,7%. Analisis statistik menunjukkan tidak terdapat hubungan bermakna antara variasi genotipe dengan kadar trigliserida (OR 0,667; CI95% 0,171–2,604; p=0,728) maupun antara variasi alel dengan kadar trigliserida (OR 0,889; CI95% 0,425–1,859; p=0,900). Penelitian ini menyimpulkan bahwa variasi genetik *SLC22A1* rs594709 tidak berhubungan secara signifikan dengan kadar trigliserida pada pasien DM tipe 2 yang menjalani monoterapi metformin di Kabupaten Sleman.

Kata kunci: *SLC22A1*, rs594709, metformin, trigliserida, Diabetes Melitus tipe 2

ABSTRACT

Metformin is the first-line therapy for patients with type 2 diabetes mellitus (T2DM). Its pharmacological action occurs primarily in hepatocytes and depends on *Organic Cation Transporter 1* (OCT1), a transporter encoded by the *SLC22A1* gene. *SLC22A1* is highly polymorphic, and one of its variants, rs594709, has been reported to be associated with greater reductions in HbA1c and triglyceride levels than the wildtype genotype. However, evidence regarding this variant in the Indonesian population remains limited. This study aimed to evaluate the association between the *SLC22A1* rs594709 variant and triglyceride levels in patients with T2DM receiving metformin monotherapy in Sleman Regency. This observational study used a cross-sectional design. A total of 60 subjects were randomly selected from 10 primary health centers in Sleman Regency. Genotyping was performed using tetra-primer amplification refractory mutation system polymerase chain reaction (T-ARMS PCR), and the results were visualized under a UV transilluminator. The association between rs594709 and triglyceride levels was analyzed using the chi-square test and odds ratios, with a significance threshold of $p<0.05$. The genotype distribution comprised 10 individuals (16.7%) with GG and 50 individuals (83.3%) with GA, while the AA genotype was absent. The frequencies of the G and A alleles were 58.3% and 41.7%, respectively. No significant association was found between genotype variation and triglyceride levels (OR 0.667; 95% CI 0.171-2.604; p=0.728) or allele variation and triglyceride levels (OR 0.889; 95% CI 0.425-1.859; p=0.900). Thus, the *SLC22A1* rs594709 variant was not significantly associated with triglyceride levels in this population of Sleman Regency.

Keywords: *SLC22A1*, rs594709, metformin, triglycerides, type 2 diabetes mellitus