

**POLIMORFISME GENA *SULFONYLUREA RECEPTOR- 1* DAN
POTASSIUM INWARDLY-RECTIFYING CHANNEL SUBFAMILY J
MEMBER 11 SEBAGAI FAKTOR RISIKO DIABETES MELITUS TIPE 2
PADA ETNIK TERNATE**

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INTISARI

Latar belakang. *Sulfonylurea Receptor-1* (SUR1) dan *Potassium Inwardly-Rectifying Channel Sub Family J Member 11* (KCNJ11) merupakan gen yang aktifitasnya pada kanal kalium dan sensitif ATP (K_{ATP}). Kanal K_{ATP} berperan sebagai sensor ATP yang berperan penting pada pengaturan sekresi insulin. Polimorfisme R1273R gen SUR1 dan E23K gen KCNJ11 menyebabkan gangguan aktivitas kanal K_{ATP} sehingga mempengaruhi sekresi insulin menyebabkan hiperglikemia dan mengakibatkan *Impaired Glucose Tolerance* (IGT) yang pada akhirnya terjadi DM tipe 2.

Tujuan. Mengkaji keterkaitan Polimorfisme R1273R gen SUR1 dan E23K gen KCNJ11 sebagai faktor risiko DM tipe 2 pada Etnik Ternate

Metode. Studi ini menggunakan rancangan kasus-kontrol dengan subjek penelitian penderita DM tipe 2 (n=52) sebagai kelompok kasus dan subjek Non-DM (n=52) sebagai kelompok kontrol. Genotiping gen SUR1 dan KCNJ11 dilakukan dengan metode PCR-RFLP. Uji T Test tidak berpasangan untuk membandingkan subjek kelompok kasus dan kontrol. Uji *chi-square* dan *odds ratio* (OR) untuk menganalisis hubungan polimorfisme R1273R gen SUR1 dan E23K gen KCNJ11 dengan risiko kejadian DM tipe 2.

Hasil. Genotip AA gen SUR1 tidak ditemukan pada etnik Ternate, frekuensi Genotip GA gen SUR1 pada kelompok kasus (9,6%) sedangkan genotip GA pada kelompok kontrol (3,8%) (p=0,256; OR 2,660). Frekuensi genotip AA gen KCNJ11 kelompok kasus (21,2%), sedangkan genotip AA pada kelompok kontrol (3,8%) (p=0,000; OR=0,088). Kombinasi genotip GG gen SUR1 dan genotip GA gen KCNJ11 dibandingkan dengan genotip GG gen SUR1 dan KCNJ11 merupakan faktor protektif DM (p=0,000; OR=0,083). Genotip GG gen SUR1 dan genotip AA gen KCNJ11 dibandingkan dengan genotip GG gen SUR1 dan KCNJ11 (p=0,975; OR=1,031). Genotip GA gen SUR1 dan KCNJ11 dibandingkan dengan genotip GG gen SUR1 dan KCNJ11 tidak berbeda bermakna (p=0,360; OR=0,375). Genotip GA gen SUR1 dan genotip GG gen KCNJ11 tidak berbeda bermakna (p=0,850; OR=0,842).

Kesimpulan. Individu yang membawa genotip GA polimorfisme R1273R gen SUR1 secara statistik tidak berbeda signifikan namun memiliki risiko terkena DM tipe 2 dibandingkan dengan pembawa genotip GG. Genotip GA polimorfisme E23K gen KCNJ11 sebagai faktor protektif DM tipe 2 pada etnik Ternate.

Kata Kunci : Polimorfisme R1273R gen SUR1, Polimorfisme E23K gen KCNJ11, DM tipe 2 dan Etnik Ternate

**POLYMORPHISM OF SULFONYLUREA RECEPTOR-1 AND
POTASSIUM INWARDLY-RECTIFYING CHANNEL SUBFAMILY J
MEMBER 11 GENES AS RISK FACTOR OF DIABETES MELLITUS
TYPE2 AMONG TERNATE ETHNIC**

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ABSTRACT

Background. The ATP-sensitive K⁺ channels (K_{ATP} channel) is composed of sulfonylurea receptor-1 (SUR1) and potassium inwardly-rectifying channel sub family J member 11 (KCNJ11). K_{ATP} channels are sensitive to ATP and involved in the regulation of insulin secretion. Polymorphisms of R1273R of SUR1 and E23K of KCNJ11 genes lead to impaired of K_{ATP} channels activity, result in the decreasing of insulin secretion. Decreasing of insulin secretion causes hyperglycemia and impaired glucose tolerance, later leads to diabetes mellitus type 2.

Aim of study. To investigate the association of polymorphism of R1273R of SUR1 and E23K of KCNJ11 gene as risk factors of DM type 2 among Ternate ethnic.

Methods. This study was a case-control study. Diabetes mellitus type 2 patients (n=52) were included to case group and normal individuals (n=52) were included to control group. Genotyping of SUR1 and KCNJ11 genes were performed by PCR-RFLP. Independent t test was used to compare characteristics of case and control groups. Chi-square test and odd ratio (OR) were used to determine the association of genetics polymorphisms with risk of DM type 2.

Results. The genotype frequency of SUR1 gene polymorphism in case group was AA 0%, GA 9.6%, GG 90.4%, while in control group was AA 0%, GA 3.8%, GG 96.2%. There was no significantly different between case and control group (p<0.005). The genotype frequency of KCNJ11 polymorphism in case and control group there was no significantly different.

Conclusion. Individuals carried GA genotype of polymorphism of SUR1 gene possess higher risk of DM type 2, compared to whom with GG genotype. GA genotype of KCNJ11 gene is the protective factor of DM type 2 in Ternate ethnic.

Key Words: Polymorphism of R1273R SUR1 gene, Polymorphism of E23K KCNJ11 gene, DM type 2, Ternate Ethnic.