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ABSTRACT

Estrogen Receptor Alpha Codon 594 G>A Polymorphism; A Risk Study for Early Onset Breast Cancer in Yogyakarta

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Background: Early-onset breast cancer has a much poorer prognosis and lower survival rate. The pathogenesis of early onset breast cancer is influenced by both environmental and genetic factors. Studies on the association between *ER-α* codon 594 G>A polymorphism with a risk for breast cancer have been conducted on various populations in the world with contradicting results. This study has not yet been done in Indonesia.
Purpose: To examine the proportion and correlation between *ER-α* codon 594 polymorphism (rs2228480) with a risk for early onset breast cancer in Yogyakarta.
Method: Blood DNA were obtained from breast cancer patients registered at RS Dr. Sardjito in 2006-2012. Samples were chosen based on two age groups; <40 and > 55 years old. PCR-RFLP method was used to examine the G>A polymorphism. The association between the frequency of certain gene and allele variants with a risk for early onset breast cancer was analyzed using Chi-square, Z-test and Odds Ratio (OR).
Result: Out of 206 samples, there are 116 (56.3%) with genotype G/G, 80 (38.8%) with genotype A/G and 10 (4.9%) with genotype A/A. Genotype and allele proportion between samples aged <40 years and >55 years showed no statistical differences (p = 0.982 and 0.642, respectively). Right-tailed Z-test (α=5%) for difference in genotype and allele proportion between the two age groups gave Z values >1.645. OR for developing early onset breast cancer were 1.148 (95%CI = 0.315 to 4.180) for GG vs AA, 1.334 (95%CI = 0.754 to 2.362) for GG vs AG, and 1.202 (95%CI = 0.766 to 1.888) for allele G vs allele A.
Conclusion: Genotype G/G was the most observed genotype variant, followed by genotype A/G and A/A. There was no statistically significant association between *ER-α* codon 594 risk allele A with a risk for early onset breast cancer in Yogyakarta.
Keywords: Early Onset Breast Cancer, Gene Polymorphism, Risk Factor, Estrogen Receptor

INTISARI

Polimorfisme Reseptor Estrogen Alfa Kodon 594 G>A; Studi Resiko Kanker Payudara Onset Dini di Yogyakarta

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LATAR BELAKANG: Kanker payudara onset dini memilikki prognosis yang lebih buruk dan tingkat kelangsungan hidup yang rendah. Patogenesis kanker payudara onset dini dipengaruhi oleh factor genetic dan juga lingkungan. Studi tentang hubungan polimorfisme G> *ER-α* kodon 594 dengan resiko kanker payudara telah dilakukan pada beberapa populasi di dunia dengan hasil yang kontradiktif. Studi genetik pada polimorfisme ini belum pernah dilaksanakan di Indonesia.

TUJUAN: Untuk memeriksa proporsi dan hubungan antara polimorfisme ER-α kodon 594 (rs2228480) dengan resiko kanker payudara onset dini di Yogyakarta.

METODE: DNA darah diambil dari pasien kanker payudara yang terdaftar di RSUP Dr. Sardjito dari tahun 2006-2012. Sampel dipilih berdasarkan dua kelompok usia; <40 tahun dan >55 tahun. Polimorfisme G>A diperiksa menggunakan metode PCR-RFLP. Hubungan antara frekuensi genotip dan alel tertentu dengan resiko kanker payudara onset dini dianalisa menggunakan analisis statistik Chi-square, Z-test dan Odds Ratio (OR).

HASIL: Dari 206 sampel, ditemukan 110 (56.3%) genotip G/G, 80 (38.8%) genotip A/G dan 10 (4.9%) genotip A/A. Persebaran proporsi genotip dan alel antara sampel berusia <40 tahun dan >55 tahun tidak menunjukan perbedaan yang bermakna (p= 0.982 dan 0.642). Pengujian Z-test arah kanan (α=5%) untuk perbedaan proporsi genotip dan alel antara kedua kelompok usia meberikan nilai Z >1.645. OR untuk terjadinya kanker payudara onset dini ditemukan 1.148 (95%CI = 0.315 - 4.180) untuk GG vs AA, 1.334 (95%CI= 0.754 - 2.362) untuk GG vs AG, dan 1.202 (95%CI= 0.766 - 1.888) untuk alel G vs alel A.

KESIMPULAN: Genotip yang paling sering muncul di penderita kanker payudara Yogyakarta adalah G/G, diikuti A/G, dan kemudian A/A. Tidak ada hubungan yang bermakna secara statistik antara alel resiko A pada ER-α codon 594 dengan resiko kanker payudara onset dini di Yogyakarta.

KATA KUNCI: Kanker Payudara Onset Dini, Polimorfisme Gen, Faktor Resiko, Reseptor Estrogen

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ABBREVIATION LIST

ER	:	Estrogen Receptor
ER-α	:	Estrogen Receptor Alpha
E2	:	Estradiol
HWE	:	Hardy-Weinberg Equilibrium
PCR	:	Polymerase Chain Reaction
RFLP	:	Restriction Fragment Length Polymorphism
SNP	:	Single-nucleotide polymorphism
OR	:	Odds Ratio
CI	:	Confidence Interval