

Hubungan antara polimorfisme gen FTO RS9939609 dengan obesitas: kajian khusus terhadap pola asupan lemak = Association between polymorphism of FTO gene RS9939609 and obesity with emphasis on fat intake pattern

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Abstrak

Obesitas merupakan masalah yang mengancam dunia dan Indonesia. Data dari Riset Kesehatan Dasar Riskedas 2013, Indonesia masih memiliki kecenderungan pola diet tinggi lemak. Faktor genetik berperan 40-70 terhadap indeks massa tubuh IMT. Salah satu gen yang diduga memengaruhi obesitas adalah gen FTO, dan variasi genetik terkuat adalah rs9939609 substitusi T/A. Variasi gen FTO rs9939609 dilaporkan menimbulkan ekspresi berlebihan dari gen FTO, yang akan memicu adipogenesis melalui demetilasi m6A yang berperan dalam alternatif splicing. Ekspresi berlebihan di hipotalamus memengaruhi pemilihan makanan densitas tinggi.

Penelitian ini menggunakan pendekatan studi potong lintang komparatif yang bertujuan untuk melihat hubungan antara polimorfisme gen FTO rs9939609 dengan obesitas dan pola asupan lemak pada subyek dewasa di Indonesia. Subyek terdiri dari 40 non obes dan 40 obes, usia 19-59 tahun, dan berdomisili di DKI Jakarta. Dilakukan pengukuran IMT, lingkaran pinggang, massa lemak, persentase massa lemak, dan wawancara kuesioner FFQ semikuantitatif dan food recall 2x24 jam.

Pemeriksaan gen FTO rs9939609 dengan metode ARMS PCR. Distribusi genotipe berada pada kesetimbangan Hardy-Weinberg $p=0,72$ dengan MAF=0,19. Subyek dengan genotipe AT/AA memiliki risiko obesitas 1,39x $p=0,009$ dan pola asupan lemak 1,73x $p=0,011$ lebih tinggi dibandingkan dengan genotipe TT. Subyek obes dengan genotipe AT/AA memiliki kecenderungan pola asupan tinggi lemak 0,714x lebih tinggi dibandingkan dengan genotipe TT.

Kesimpulan: Subyek dengan FTO rs9939609 genotipe AT/AA memiliki risiko obesitas yang lebih tinggi dan cenderung memilih makanan tinggi lemak dibandingkan dengan subyek genotipe TT.

.....Obesity is a global health problem including in Indonesia. Baseline Health Research Riskedas 2013, Indonesia tended to have high dietary fat. Available data demonstrated that genetic factors are associated with BMI 40 70. The FTO gene has been well documented as one of the genes to be associated with obesity by modulating adipogenesis with alternative splicing through m6A demethylation. FTO gene variation rs9939609 was reported to lead to FTO mRNA overexpression in hypothalamus, which induce a preference towards high energy dense foods. However, the correlation between FTO gene variation rs9939609 and fat intake pattern is still not well described.

This study aimed to investigate the relationship between FTO gene rs9939609 with obesity and fat intake pattern of Indonesian adults. A cross sectional comparative study design was applied in this study by recruiting 40 non obese and 40 obese subjects, aged 19 59, who were living in DKI Jakarta. Measurements included BMI, waist circumference, fat mass, fat mass percentage, and interview with FFQ semi quantitative and food recall 2x24 questionnaire.

Genetic variation was determine by ARMS PCR. The genotype distribution of FTO gene rs9939609 was at Hardy Weinberg equilibrium $p=0.72$ with MAF 0.19. This study showed that the AT AA genotype has 1.39x

higher risk of obesity $p = 0.009$ and 1.73x higher dietary fat intake $p = 0.011$ than the TT genotype. Obese subjects with AT AA genotype tended to have higher dietary fat intake of 0.714x than the obese subjects with TT genotype.

These findings suggest that subjects with the AT AA genotype of the FTO rs9939609 have higher obesity risk and preference to high dietary fat intake than subjects with the TT genotype.