The effect of the *FTO rs9939609* on anthropometrical measurements in female adolescents with overweight and obesity

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Abstract

Statement of the Problem: Among the causes of obesity an important role is played by the heredity. The *FTO* is one of the genes associated with obesity and body mass fat. And polymorphism *rs9939609* of this gene located in the first intron (the code is W = A/T) appears the most significant.

Methodology & Theoretical Orientation: The study included total of 128 Caucasian female adolescents (average age 15.86±1.02) living in Eastern Siberia (Irkutsk region, Russia). SDS BMI, % of body mass fat was measured. 59 girls were included in group with normal weight (SDS BMI 0.84±0.55) and 69 girls were included in group with overweight and obesity (SDS BMI 2.52±0.72). Genomic DNA was extracted from EDTA-treated whole blood by commercial kits (DNA-Sorb-B, AmpliSens, Russia). Genotyping of the *FTO rs9939609* was performed using polymerase chain reaction in real time with DT-Prime cycler (DNA-technology, Russia). Statistical analysis was performed by soft "STATISTICA8.0".

Findings: A-allele frequency was 40% in control group and 49% was in group with overweight and obesity (p=0.223). Comparisons of SDS BMI and percent of body mass fat stratified by *FTO rs9939609* genotypes are showed in Table 1. We found the significant increase of SDS BMI in carriers of A-allele in group with overweight and obesity. There is no this association in group with normal weight.

Conclusion & Significance: Thus, carrier of the A-allele of *FTO rs9939609* are associated with higher meaning of SDS BMI in female adolescents with overweight and obesity, living in Eastern Siberia.

Image

Measurements	Genotypes			p-value
	AA (1)	AT (2)	TT (3)	
Control group (n=60)				
SDS BMI	0.78±0.58	0.85±0.55	0.93±0.52	0.681^{1-2}; 0.499^{1-3}; 0.603^{2-3}
% of body mass fat	35.96±3.66	33.22±14.50	31.06±8.10	0.633^{1-2}; 0.195^{1-3}; 0.460^{2-3}
Group with overweight and obesity (n=69)				
SDS BMI	2.82±0.60	2.45±0.66	2.36±0.84	0.023^{1-2}; 0.047^{1-3}; 0.559^{2-3}
% of body mass fat	44.43±12.86	44.90±5,06	42,43±6.10	0.483^{1-2}; 0.085^{1-3}; 0.232^{2-3}

Table 1. Comparisons of SDS BMI and percent of body mass fat stratified by FTO rs9939609 genotypes

Biography

Dr. Tatyana Bairova graduated from Tomsk Medical Universitety as a Pediatrician. After that she went on to complete her post-graduate study at Scientific Centre for Family Health and Human Reproduction Problems (SC FHHRP, Irkutsk, Russian Federation) where she has stayed as a specialist and a researcher until today.

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Recent Publications (minimum 5)

1. Hallman DM, Friedel VC, Eissa MAH, Boerwinkle E, CharlesHuber JJr., Harrist RB, Srinivasan SR, Chen W, Dai S, Labarthe DR, Berenson GS (2012) The association of variants in the FTO gene with longitudinal body mass index profiles in non-Hispanic white children and adolescents. J Obes (Lond); 36: 61–68.
2. Peng S, Zhu Y, Xu F, Ren X, Li X, Lai M (2011) FTO gene polymorphisms and obesity risk: a meta-analysis. BMC Medicine 9:71
3. Ursu R, Badiu C, Cucu N, Ursu GF, Craciunescu I, Severin E (2015) The study of the rs9939609 FTO gene polymorphism in association with obesity and the management of obesity in a Romanian cohort. Journal of Medicine and Life 8:232-238.
4. Young AI, Wauthier F, Donnelly P (2016) Multiple novel gene-by-environment interactions modify the effect of FTO variants on body mass index. Nature Communications 7:12724.
5. Loos RJF, Yeo GSH (2014) The bigger picture of FTO – the first GWAS-identified obesity gene. Nature reviews Endocrinology 10:51-61.