



DETERMINATION OF EPIDEMIOLOGY OF GENE AND GENOTYPES DETERMINING BODY WEIGHT BY KETLE INDEX INDICATOR

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ABSTRACT

At the Bukhara Regional Multidisciplinary Medical Center, 102 overweight patients were examined in an inpatient setting. An analysis of the distribution of genes depending on the level of overweight was performed. Slightly more ADRB3 (rs4994) Trp 64 Arg gene 1 genotype Trp / Trp in patients with primary overweight 55% of cases, ADRB2 (rs1042713) A> G, AG genotype 53.8% of patients with secondary overweight and Trp / Trp genotype was encountered in the most 100% of cases. In patients with tertiary overweight, the C / C genotype of the PPARG2 (rs1801282) gene was reported to be present in a maximum of 84.6% of cases, while the G / G genotype was almost non-existent.

Key words: *overweight, nutrigenomics, ADRB3 gene (rs4994), ADRB2 gene (rs1042713), PPARG2 gene (rs1801282), obesity.*

In modern medicine, overweight and obesity are now one of the most common diseases in economically developed countries. In part of the world's population, overweight is diagnosed, and more than 15% of the population is obese. According to the World Health Organization, 2.7 billion people are overweight, accounting for about 30% of the world's population. Obesity occurs in 10-25% of the European population, and in 1/3 of the American population, 502 million people are overweight. The prevalence of obesity will be 9.1% by 2020. The World Health Organization estimates that it will reach a population of about 300 million by 2025 [3.4.5.10].

The epidemiology of chronic diseases depends on the ethnic characteristics, geographical and socio-economic conditions of the people. Being overweight and obese leads to cardiovascular disease and the development of type II diabetes, metabolic syndrome and many other diseases. The increase in body mass in the human body is often the result of less exercise and an increase in food calories. The increase in body mass, the presence of hereditary predisposition to major body weight and obesity are related to the genetic background [1.9.12.13].

Today, data on excess body weight is increasing. Different types of genes are associated with disorders of lipid and carbohydrate metabolism, leading to the development of metabolic syndrome. However, this problem is poorly understood in the Republic of Uzbekistan. Gene polymorphism (ADRB2 and ADRB3), B2 and B3 adrenoceptors play a key role in increasing body mass. The gene ADRB2 B2 adrenoceptors are found in smooth muscle, bronchioles, liver cells, skeletal muscle, and other tissues. With the onset of glycogenolysis in the liver, the breakdown of glycogen in skeletal muscle is observed and metabolism is activated. The most common ADRB2 gene is associated with obesity. The ADRB3 gene B3 adrenoceptors activate adenylate cyclase in visceral adipose tissue, resulting in increased lipolysis in adipose tissue. The ADRB3 gene affects Trg 64 Agr protein receptors, leading to an increase in body mass [2.8.10.14].

Excess body weight and obesity combine to form metabolic syndrome (MS). The development of metabolic syndrome worsens a person's quality of life. It leads to early disability, death. Patients with metabolic syndrome have a 1.7-2.2% risk of developing cardiovascular disease. This disease is 3 times more common in people with metabolic syndrome than in those without metabolic syndrome. Appetite-controlling genes mainly control the lepin-melanocortin system. This leads to severe obesity as a result of systemic dysfunction. The 5 genes LEP, LEPR, POMC, PCSKI, and MC4R strongly increase appetite, making these individuals lose their sense of satiety. According to the literature sources, more than 20 genes lead to the development of metabolic syndrome. The gene FABR2 is located in the epithelium of the small intestine. Using this gene, fats are absorbed in the small intestine. Excess body weight is observed in individuals with the Th 54 gene. This is mainly due to an increased tendency to abdominal obesity [7.8.11.15].

The distribution of genes at different levels of overweight index has not been fully studied in Uzbekistan. Being overweight and obesity is not only an ethnic problem, it is a risk factor that leads to atherosclerosis, UIC, arterial hypertension, ischemic stroke, type II diabetes, male and female infertility. This, in turn, requires further research to study the distribution of genes in overweight and obesity.

OBJECTIVE

To analyze the distribution of genes and genotypes according to the level of the Kettle index.

MATERIALS AND METHODS

102 overweight patients were treated in different departments of the Bukhara Regional Multidisciplinary Medical Center. Of the 102 patients examined, 30 were distributed in the control group and 72 in the main group. 72 patients in the main group were divided into 3 groups according to their overweight index. The first degree of overweight was detected in 20 patients, the second degree in 13 patients, and the third degree in 11 patients. In the above patients, height, body weight, overweight index, 3 different types of genes in the blood and their 7 different genotypes were identified and the results were analyzed.

THE RESULTS OBTAINED

In both genotypes of the ADRB2 (rs1042713) A> G gene at the first level of overweight, AA-50% and AG-50% were detected in 10 patients (Table 1). ADRB3 (rs 4994) 2 genotypes of the Trp 64 Arg gene belonged to the most common genotype type, with Trp / Trp in 55% of cases in 11 patients and Trp / Arg in 45% of cases in 9 patients. 3 genotypes of PPAR G2 (rs1801282) C 34 G gene C / G -35% in 7 patients, C / C in most patients of this gene - 55% in 11 patients, G / G genotype - 10% in 2 patients in the lowest case detected.

Table 1

The number of encounters of genotypes in the first degree of overweight is in%.

№	GEN	Genotype	number of meetings	%	average age	Male		Woman		Average height	average body weight	average body weight index	Erythrocyte sedimentation rate is mm / h	Alt ME / n	Ast ME / n	total bilirubin, mkmol / l	direct bilirubin , mkmol / l	urea , mmol / l	cholesterol ,3,1 before 5 mmol / l	high carpenter lipoprotein 0,72 before 1,63 mmol / l	female carpenter lipoprotein 2,02 before 4,79 mmol / l
						%	%	%	%												
1	ADRB2(rs1042713)A>G	A/A	10	50	52,9	3	15	7	35	163,3	72,6	27	11,3	38,2	29,2	13,3	10,6	5,3	5,7	0,9	2,2
		A/G	10	50	49	7	35	3	15	166,1	75,7	27	9,1	23,6	21,6	11,3	3,3	4,4	6,6	1,0	2,8
2	ADRB3(rs4994)_Trp64 Arg	Trp/Trp	11	55	49,3	2	10	9	45	165	74,3	27	10,7	24,5	23	11,5	4,4	4,7	6,1	1,0	2,6
		Trp/Arg	9	45	60,3	8	40	1	5	163,7	73	27	7,33	66,7	39	16,3	21,5	5,6	6,4	1,0	2,0
3	PPARG2(rs1801282)_C34G	C/G	7	35	50,4	5	25	2	10	168	76,8	27	7	43,3	27,5	12,1	9,5	4,4	6,2	1	2,3
		C/C	11	55	47,7	4	20	7	35	163	72,7	27	12,4	24,7	25,2	12	6,2	5,4	5,9	1,0	2,6
		G/G	2	10	43,5	1	5	1	5	162,5	72,5	27	9	21,5	19	14,5	2	3,2	6,0	1,1	2,5
4	total		20	100	50,4	10	21,4	10	21,4	161,5	73,9	27	9,5	34,6	26,3	13,0	8,2	5,1	6,1	1,0	2,4

The second level of overweight (Table 2) ADRB2 (rs1042713) was found to have AA-46.1% in 6 patients in the first genotype of the A> G gene and AG-53.8% in 7 patients in the second genotype. ADRB3 (rs 4994) _Trp 64 The first genotype of the Arg gene was detected in a maximum of Trp / Trp- 100% in 13 patients, while the second genotype Trp / Arg was almost undetected. Three genotypes of the PPAR G2 (rs1801282) _C 34 G gene were detected in at least 15.3% of cases of C / G in 2 patients, C / C- 84.6% in 11 patients, and the third most common genotype G / G- was not sufficiently identified. In total, there were no changes in almost all biochemical parameters in 20 patients, in particular, cholesterol-6.18mmol / l was slightly higher than normal, LPVP-1.04mmol / l and LPNP-2.47mmol / l.

Table 2

The number of encounters of genotypes in the second degree of overweight is in%.

№	GEN	Genotype	number of meetings	%	average age	Male		Woman		Average height	average body weight	average body weight index	Erythrocyte sedimentation rate is mm / h	Alt ME / n	Ast ME / n	total bilirubin, mkmol / l	direct bilirubin , mkmol / l	urea , mmol / l	cholesterol ,3,1 before 5 mmol / l	high carpenter lipoprotein 0,72 before 1,63 mmol / l	female carpenter lipoprotein 2,02 before 4,79 mmol / l
						%	%	%	%												
1	ADRB2(rs1042713)A>G	A/A	4	36,6	43,5	1	9,09	3	27,27	166,7	81,5	29	18,7	38,5	26,7	8	3	3,5	5,4	1,2	2,8
		A/G	7	63,6	47,7	6	54,5	1	9,09	172,5	87,2	29	13	26,8	23,2	17,4	7,0	6,1	5,7	1,0	2,3
2	ADRB3(rs4994)_Trp64 Arg	Trp/Trp	8	72,7	46,6	5	45,4	3	27,27	171,3	86	29	13,6	33,7	26,2	16	4,6	5,3	5,6	1,1	2,5
		Trp/Arg	3	27,3	45	2	18,1	1	9,09	168	83	29	19	24	20	12,1	8	4,7	5,7	1,0	2,3
3	PPARG2(rs1801282)_C34G	C/G	2	18,2	38	1	9,09	1	9,09	168	82	29	26,5	26	19,5	18	2,6	5	5,9	1,1	2,4
		C/C	9	81,8	48	6	54,5	3	27,27	171	85,8	29	12,5	32,2	25,6	13,1	4	5,4	5,4	1,1	2,5
		G/G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	total		11	100	44,8	7	63,6	4	36,3	169,6	84,2	29	17,2	30,2	23,5	14,1	5,2	4,8	5,7	1,1	2,5

At the third level of overweight (Table 3), ADRB2 (rs 1042713) was found to have AA-36.6% in 4 patients in the first genotype of the A> G gene and AG-63.6% in 7 patients in the second genotype. . In total, 11 patients showed no change in almost all biochemical parameters, in particular, cholesterol-4.88mlmol / l, LPVP-0.96mlmol / l and LPNP-2.14mlmol / l.

Table 3

The number of encounters of genotypes in the third degree of overweight is in%

№	GEN	Genotype	number of meetings	%	average age	Male		Woman		Average height	average body weight	average body weight index	Erythrocyte sedimentation rate is mm / h	Alt ME / л	Ast ME / л	total bilirubin, mkmol / l	direct bilirubin , mkmol / l	urea , mmol / l	cholesterol ,3,1 before 5 mmol / l	high carpenter lipoprotein 0,72 before 1,63 mmol / l	female carpenter lipoprotein 2,02 before 4,79 mmol / l
						%	%														
1	ADRB2(rs1042713)A>G	A/A	6	46,15	40	3	23,08	3	23,08	169,16	80,6	28	8,16	21,66	24,5	12,16	7,58	5,71	5,86	1	2,41
		A/G	7	53,85	53,7	2	15,38	5	38,46	162,5	75,1	28	12,5	32,4	24,2	16,4	9,07	6,64	6,25	1,05	2,39
2	ADRB3(rs4994)_Trp64 Arg	Trp/Trp	13	100	47,3	5	38,46	8	61,54	165,6	77,6	28	10,5	27,4	24,3	14,4	8,38	6,21	6,07	1	2,40
		Trp/Arg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	PPARG2(rs1801282)_C34G	C/G	2	15,38	31,5	2	15,38	-	-	171	82,5	28	22,5	26	19,5	18	2,65	4	5,95	1,13	2,42
		C/C	11	84,62	50,8	3	23,08	8	61,54	164,6	76,8	28	11,3	27,8	24,7	14	27,2	6,51	5,93	1,01	2,39
		G/G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	total		13	100	44,66	5	38,46	8	61,54	166,57	78,52	28	12,99	27,05	23,44	14,99	10,98	5,81	6,01	1,03	2,40

Thus, 1 genotype of the ADRB3 (rs 4994) _Trp64 Arg gene, Trp / Trp- 55%, and 2 genotypes of the ADRB2 (rs 1042713) A> G gene are also most common in patients with primary overweight. -50% and AG-50% of cases were detected. Of the 3 genotypes of the PPAR G2 (rs1801282) _C34 G gene, only the C / C genotype was the most common, accounting for 55%. . In total, 13 patients had no change in almost all biochemical parameters, in particular, the level of cholesterol was 4.85 mlmol / l, LPVP - 1.12 mlmol / l and LPNP - 2.5 ml / l.\

When the excess body mass index was 28, i.e. secondary ADRB2 (rs1042713) A> G, the genotype AG-53.8% was encountered, and the genotype Trp / Trp- 100% was detected the most. PPAR G2 (rs1801282) _C34 C gene C / G-15.3%, the least common of this gene, C / C genotype - 84.6% of cases, ie the most common, and the third genotype G / G- was not detected at all.

CONCLUSIONS

The ADRB2 (rs1042713) A> G, AG genotype was most prevalent when the overweight index was 29, ie in the third degree - 63.6%. The first genotype of the ADRB3 (rs4994) _Trp 64 Arg gene was the most common and accounted for 72.7% of Trp / Trp. The C / G genotype of the PPARG2 (rs1801282) _C34 G gene was 18.2%, with the lowest case observed within this gene. C / C- 84.6%, most detected, third genotype G / G- not detected at all.

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