MODERN MEDICINE AND PRACTICE
https://inovatus.es/index.php/ejmmp
EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE
Vol. 3 No. 12 (Dec - 2023) EJMMP ISSN: 2795-921X

EVALUATION OF OPTIMIZATION FOR PREVENTION OF COMPONENTS OF METABOLIC SYNDROME IN OUTPATIENT CONDITIONS

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Annotation: Among the unorganized population, the prevalence of the main components of the metabolic syndrome, which are the main risk factors for cardiovascular diseases, is high and amounts to 63%. In the unorganized population, there is a steady increase in the incidence of risk factors for cardiovascular diseases. Currently available preventive technologies do not meet modern requirements and cannot achieve full results as a result of their use. Modern prevention of metabolic syndrome and cardiovascular diseases requires the use of software methods for calculating cardiovascular risk. The use of modern gadgets, diagnostic and preventive digital programs significantly increases the effectiveness of preventive measures. In modern conditions, combining traditional methods with innovative information and communication technologies, it is possible to achieve a positive prevention effect of 80%.

Key words: obesity, arterial hypertension, disorders of carbohydrate and lipid metabolism.

Relevance : Metabolic syndrome (MS) fully corresponds to the definition of the concept and is a group of modifiable and interrelated risk factors for the development of cardiovascular diseases (CVD) and type 2 diabetes mellitus (DM). The first publications describing this phenomenon appeared in the early 1920s. However, the main time of creation of this concept is considered to be 1988, when Riven G.M. proposed the term “syndrome X” to combine risk factors such as insulin resistance (IR), impaired glucose tolerance (IGT), triglyceride (TG) levels, high-density lipoprotein (HDL), obesity and hypertension [1,3,4]. Unresolved problems with the MetS concept include the lack of a generally accepted definition, the unclear role of different MetS phenotypes in predicting the risk of cardiovascular disease (CVD) and type 2 diabetes (T2D), and, finally, the lack of a therapeutic approach. a tool based on the principles of unified evidence-based medicine. WHO experts described metabolic syndrome (MS) as a “pandemic of the 21st century” [2,5,6]. The prevalence of MS is 20-40%. It is more common in middle-aged and elderly populations (30-40%). People with multiple sclerosis have significantly higher rates of cardiovascular disease and mortality than people without it.

The ultimate goal of further research in multiple sclerosis is to develop therapeutic strategies to prevent the development of diabetes and cardiovascular disease. Clinical trial results indicate that prevention programs can prevent or delay the development of these diseases and reduce mortality in risk groups [7,8,9].

For humanity, which over the centuries has overcome epidemics of life-threatening infections, the problem of cardiovascular diseases has become relevant among all causes of illness and death. An important role in this is played by limiting physical activity, increasing calorie intake, and changing lifestyle associated with a constant increase in emotional stress. Early detection of chronic diseases among the population, especially in arid zones, requires a fundamental improvement in the quality of the population health surveillance system[10]. In recent years, metabolic syndrome has become one of the important problems of the world

community in the field of medicine and occupies a leading position among pathologies leading to complications in the course of diseases.

Metabolic syndrome is currently one of the important problems requiring solutions in medicine due to its prevalence, complications, mortality and economic damage [11,12].

A study of the WHO-recommended risk factors for metabolic syndrome proves the necessity of improving health indicators and implementing prevention by assessing the improvement of prevention of components of metabolic syndrome in outpatient settings of the population in the conditions of our republic, which is several times more effective than traditional prevention. Correct, early prevention and rational pharmacoprophylaxis can be implemented in the general population by assessing improved population-based prevention of metabolic syndrome components in outpatient settings. As a result, early recovery of the population from the harmful effects of metabolic syndrome risk factors, improved health and quality of life is achieved [5,7,8].

In Western countries, the prevalence of metabolic syndrome averages 25-35%, and its incidence increases with age. 42-43.5% common among people over 60 years of age. In the US, 47 million people suffer from metabolic syndrome, and in Europe - 1/4 of the population. According to the Framingham Study, the prevalence of metabolic syndrome is 22% among men and 27% among women. Metabolic syndrome is characterized by pathogenetically interrelated complex metabolic disorders; the main causal pathogenetic mechanism of its development is difficult to determine. The only conclusion of a large number of studies explaining the pathogenesis of metabolic syndrome is that this syndrome is a symptom complex of metabolic disorders that vary depending on lifestyle and individual typological characteristics of the body with the priority of one or another component. The study of specific regional features of the distribution, genesis, diagnosis and correction of the course of MS requires in-depth scientific research [7,8,9,10].

In the 21st century, for humanity, which has overcome epidemics of life-threatening infections throughout its centuries-old history, the problem of cardiovascular diseases has become relevant among all causes of illness and mortality. It is important to limit physical activity, increase calorie intake, and change lifestyle associated with a constant increase in mental workload. All this increases the main risk factors for cardiovascular disease: high blood pressure, dyslipidemia, diabetes and obesity.

One of the important epidemiological trends is the constant increase in the total number of people with metabolic syndrome. Accordingly, the goal is to increase the spread of damage to organs - heart, blood vessels, kidneys. Along with hemodynamic disturbances, metabolic and humoral factors also play an important role in the development of these injuries. Metabolic syndrome develops as a result of lifestyle and genetic factors[2].

One of the main causes of metabolic syndrome, which is now recognized as an epidemic, is a decrease in physical activity and a diet rich in carbohydrates. Currently, there is no consensus on the causes of metabolic diseases. At the same time, tissue insulin resistance and compensatory hyperinsulinemia lead to impaired glucose tolerance and the formation of metabolic syndrome [5].

In recent decades, much attention has been paid to metabolic syndrome (MS), based on insulin resistance. This syndrome includes a number of risk factors (RF): arterial hypertension (AH), HDB, dyslipoproteinemia (DLP), obesity, hyperuricemia and other risk factors. The main goal of identifying patients with metabolic syndrome is to use various preventive methods to reduce risk factors. Currently, these programs are carried out in two areas: type 2 diabetes and screening and prevention of cardiovascular diseases. The problem of metabolic syndrome is associated with the need to increase educational activity among patients with obesity and diabetes, promote the basic principles of prevention, especially among children and youth, as well as promote socially significant healthy eating [9].

The medical side of the problem of MS is associated with the improvement of BMI diagnostics and the emergence of new effective methods of drug treatment of the main risk factors that make up MS (obesity, arterial hypertension, disorders of carbohydrate and lipid metabolism). From the point of view of a comprehensive analysis based on observation results, it is possible to evaluate the effectiveness of various non-drug methods of treating metabolic syndrome and study the health status of patients with risk factors for the development of metabolic syndrome. metabolic syndrome and its main components [7,8]. A very positive effect will have an increase in physical activity, as well as changes in diet and improvement of anthropometric indicators necessary to prevent the development and progression of metabolic syndrome, as well as the development of an international method for assessing the risk of metabolic syndrome.

The use of an innovative prevention program provides a methodological basis for the development of individual prevention strategies for patients with metabolic syndrome and its main components [10].

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Purpose of the study: to evaluate the improvement in the prevention of metabolic syndrome components in the population in an outpatient setting using an innovative algorithm.

Materials and methods: The study was conducted in Bukhara. In total, 1050 patients were examined in Bukhara, examined under a program that ensures the identification of the main components of multiple sclerosis. The following research methods were used during the examination: - blood glucose, insulin, glycosylated hemoglobin, excess body weight, coagulogram, creatinine, clinical blood and urine analysis, abdominal obesity, blood pressure, blood lipids, Kettle index, waist circumference, tolerance. to physical activity and body structure (Table 1).

All patients were comparable in age, gender, therapy received and concomitant diseases - patients were aged from 20 to 80 years and did not receive glucose-lowering therapy. In the RF study, the group did not include people with unclear diseases of the gastrointestinal tract, as well as severe diseases of the cardiovascular and endocrine systems (including myocardial infarction, severe rhythm and conduction disorders, cerebral strokes and other serious diseases).

Table 1. Dynamics of distribution of risk factors over 15 years (in%)

Term / FR	Research at the beginning n =366	15 years later n=366	P
AG	17.13	25.97	<0.05
BMI	18.03	13.66	<0.05
Diabetis	3.58	9.29	<0.05
IGT general	34.15	25.68	<0.05
IGT after 1 hour	19.40	4.64	<0.05
IGT in 2 hours	8.74	16.67	<0.05
IGT after 1 and 2 hours	6.01	4.37	> 0.05
HX	17.31	11.24	< 0.05
HTG	22.76	28.11	<0.05
G-b-lip	18.65	24.90	<0.05
General FR	65.63	80.15	<0.05

The results of the ban are associated with the dynamics of the distribution of GTB and the appearance of violations of various phases of the glycemic curve, physiological and pathogenetic features that arise in the body with age. With age, there is a decrease in the activity of the body's sympathoadrenal system, which is closely related to the activity of the 1st stage of the glycemic curve and can to some extent be explained by a decrease in the frequency of GTB due to hyperglycemia 1 hour after a glucose load. At the same time, an increase in the frequency of violations of the 2nd stage of the glycemic curve may be associated with a decrease in insular activity due to an increase in various anti-insular factors depending on age. After 15 years, there was a significant reduction in the incidence of BMI. In the literature, this fact is explained by changes in lifestyle and nutrition in a number of countries, including the CIS countries, especially in Russia.

As for the dynamics of the spread of various types of hyperlipidemia, unclear changes have been identified. In addition to a significant increase in the prevalence of HTG and GbLIP, there was a decrease in the frequency of GC (also statistically significant). It is impossible to give a clear explanation for this fact within the framework of the study. It seems that the answer to the question about the multifaceted dynamics of the spread of various types of hyperlipidemia can be provided by a more in-depth special study **.** Then the average levels of FR dynamics over 15 years were studied. An analysis of the levels studied by senior officers over a 15-year observation period revealed different dynamics of these indicators (Table 2). An

increase in blood pressure (BP) as well as fasting glucose and a decrease in blood pressure and glycemia were observed 2 hours after the glucose load and 1 hour after the glucose load.

It should be noted that the average values of SBP and DBP increased significantly. At the same time, no significant differences were noted between the growth rates of SBP compared to the growth rates of DBP.

There was a slight increase in postprandial glycemia and a decrease in KI, but the differences were not statistically significant. After 15 years of glucose loading, glycemia increased by 14.42 mg% at 2 hours, and glycemia decreased by 17.52 mg% at 1 hour after glucose loading.

The above shows that the prevalence of BMI has decreased significantly over 15 years. However, it did not show a significant decrease in the level of the Quetelet index. In order to find out the reasons for this fact, the dynamics of the level of CI in groups with normal and increased body weight was studied. It was found that over 15 years, the average level of IC increased from 0.245±0.028 to 0.253±0.40 among the population with normal body weight, and the average level of IC decreased from 0.322+0.034 to 0.252+0.042 in the population with BMI (p <0. 05).

2 – Table. Dynamics of mean arterial pressure, Quetelet index and glycemia over 15 years

term / level	At the beginning of the study n =366		15 years later n =366		R
	M	± b	M	± b	
With blood pressure	124.11	18.37	129.83	23.58	<0.05
DBP	77.13	11.27	82.37	11.65	<0.05
And index Ketle	0.259	0.041	0.252	0.040	> 0.05
Glycemia on an empty stomach	83.28	16.77	85.75	20.41	> 0.05
Glycemia after 1 hour	143.47	43.14	125.95	26.38	<0.05
Glycemia after 2 hours	84.16	31.96	98.58	25.42	<0.05
Cholesterol	201.13	32.86	190.81	27.15	<0.05
Triglyceride	105.94	27.64	124.90	28.01	<0.05
β -L hypoprotein	50.17	14.49	56.32	17.29	<0.05

The dynamics of mean lipid levels generally correspond to the dynamics of hyperlipidemia . A decrease in mean cholesterol values was observed along with an increase in mean triglyceride and β- lipoprotein values. The findings indicate that the prevalence of hypertension and blood pressure increases as the population ages. In this case, an increase in systolic and diastolic blood pressure is observed. The prevalence of hyperglycemic conditions increases with age.

Along with an increase in the incidence of diabetes and a violation of the vagoinsular phase of the glycemic curve, a decrease in the sympathoadrenal phase of the glycemic curve is observed. The decrease in BMI prevalence with age does not fully reflect changes in the height and weight characteristics of the population.

Therefore, it is advisable to study the dynamics of body mass index separately in groups of normal and increased body weight. The increase in the frequency and level of risk factors with age indicates the need for targeted active identification of these risk factors for the timely use of preventive measures. Considering the fact that the predictive value of a negative RF increases when they are combined, in accordance with the literature data, the prevalence of a quantitative combination of RFs in different age groups was studied (Table 3).

Table 3. Frequency of risk factors in different age groups combination (in%)

years FR quantity	20-29 years n=256	30-39 years n=255	40-49 years n=276	50-59 years n=436	60-69 years n=112
no **FR**	53.91	32.94*	18.48**	9.40**	8.04
1 **FR**	33.59	37.25	34.42	33.49	24.11 *
2 **FR**	11.33	23.92*	27.17	33.03*	38.39
3 **FR**	1.17	5.49*	17.03**	19.04	23.21
4 **FR** (MS)	0	0.39	2.90*	5.05	6.25
Total	100.00	100.00	100.00	100.00	100.00

Note: the table shows the significance of the differences compared to the previous age group.

The data obtained show that with increasing age, the number of cases of combination of risk factors increases. It should be noted that an increase in various quantitative combinations of the considered risk factors occurs in each subsequent age group. At the same time, there is a high increase in the combination of risk factors among the age groups 30-39 and 40-49 years. It is during this period that the most obvious increase in the frequency of RF combinations occurs.

Then, with age, an increase in the frequency of RF combinations is also observed, but it is no longer so noticeable. Note that in the age group of 20-29 years there was not a single case of MS. It is worth noting that with increasing age, the number of unexamined risk factors decreases (which is understandable), and a decrease in the presence of only one factor is observed. A study of the frequency of cases of various combinations of risk factors showed that in certain age periods their different prevalence is observed.

The greatest increase in isolated hypertension occurs after 50 years. Hypertension is often combined with BMI and IGT, and the frequency of this combination increases with age. It should be noted that in the youngest group (20-29 years old), the combination of IGT with HC and hypertension, as well as IGT with BMI and HC, is absent. There is no correlation between hypertension, BMI and IGT with the combination of HCQ and age.

The combination of the 4 studied risk factors increases with age, but the largest and statistically significant increase in the frequency of this type of risk factor combination occurs after 40 years and continues until 60 years. Thus, according to the information presented above, there is a certain connection between age and the presence of risk factors, their number and combinations.

In addition, the correlation between the studied RFs was studied (Table 4). According to the data obtained, there is an unclear individual correlation between the risk factors. It turned out that in general the level of almost all coefficients is reliable (with the exception of the correlation coefficients of the Quetelet index with Cholesterol and β- lipoproteins).

Correlation coefficients between indicators It is worth noting that with increasing age, the number of untested risk factors decreases (which is understandable), and there is a decrease in the presence of only one factor. A study of the frequency of cases of various combinations of risk factors showed that in certain age periods their different prevalence is observed.

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Table 4. Blood pressure, Quetelet index, lipids and glycemia correlation coefficients between indicators

	With blood pressure	DAH	ketle index	HX	TG	β-lip	On an empty stomach	After 1 hour
DAH	0.75*	-						
Ketle index	0.36**	0.45*						
HX	0.1 *	0.03	0.01					
TG	0.2*	0.09	0.11*	0.45*				
β-lip	0.12*	0.06	0.08	0.63*	0.34 *			
Glycemia								
On empty stomach	0.13*	0.12*	0.21*	0.2*	0.35 *	0.18*		
After 1 hour	0.18*	0.14*	0.22*	0.05	0.22 *	0.1*	0.41*	
After 2 hours	0.25*	0.21*	0.29*	0.16*	0.52 *	0.11*	0.43*	0.42*

Thus, the prevalence of the MS components under consideration in the study population is quite high. The prevalence of multiple sclerosis and its components increases with age. The most intensive growth of MS and its components is observed after 40 years. At the same time, the dynamics of the distribution of individual MS components is unclear. As the population ages, the prevalence of MS components increases, as does their combination. In addition to the level of cholesterol and β-lipoprotein, there is a correlation between the studied risk factors and body weight indicators. Thus, the prevalence of the MS components under consideration in the study population is quite high. The prevalence of multiple sclerosis and its components increases with age. The most intensive growth of MS and its components is observed after 40 years. At the same time, the dynamics of the distribution of individual MS components is unclear. As the population ages, the prevalence of MS components increases, as does their combination. In addition to the level of cholesterol and β-lipoprotein, there is a correlation between the studied risk factors and body weight indicators.

Innovative technologies used in prevention

1. Digital program for calculating cardiovascular risk taking into account the main components of the metabolic syndrome.
2. The program can run on a computer, tablet and smartphone.
3. The program allows the patient to independently control the condition and risk of MS components.

Cardiovascular diseases in metabolic syndrome risk calculation software

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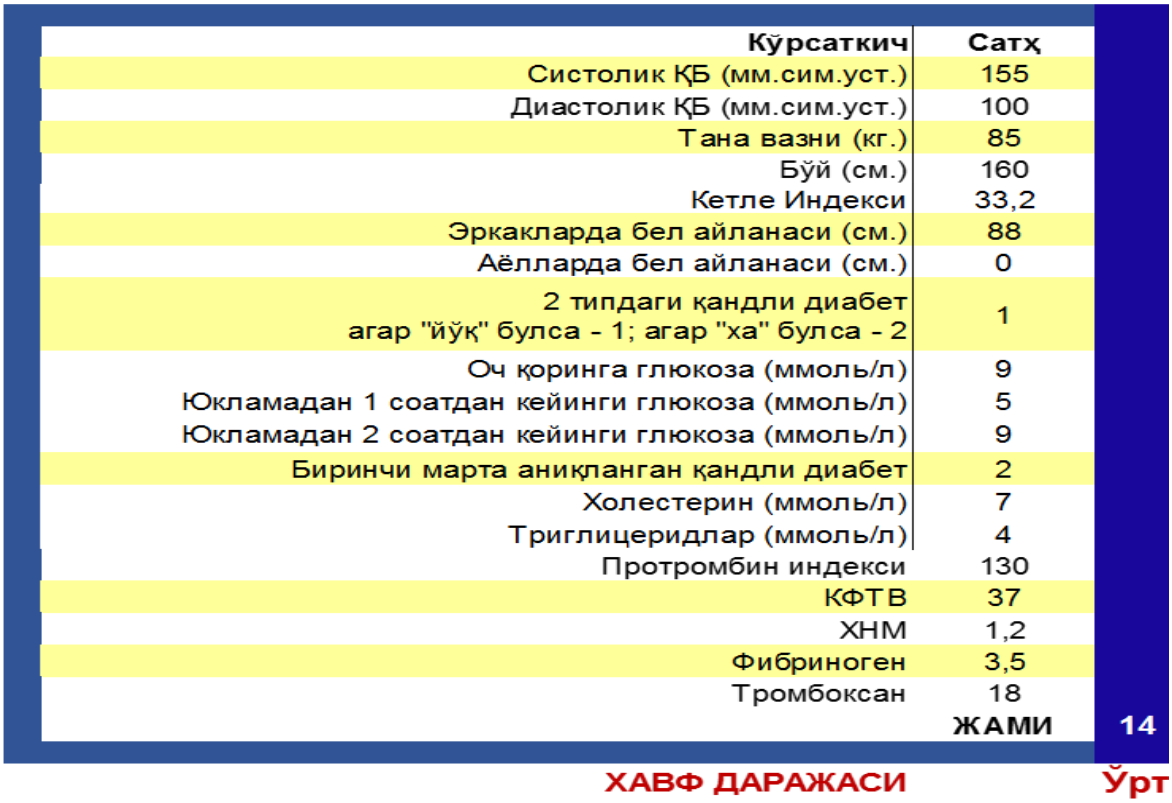

Кўрсаткич	Сатҳ
Систолик ҚБ (мм.сим.уст.)	155
Диастолик ҚБ (мм.сим.уст.)	100
Тана вазни (кг.)	85
Бўй (см.)	160
Кетле Индекси	33,2
Эркакларда бел айланаси (см.)	88
Аёлларда бел айланаси (см.)	0
2 типдаги қандли диабет агар "йўқ" булса - 1; агар "ха" булса - 2	1
Оч қоринга глюкоза (ммоль/л)	9
Юкламадан 1 соатдан кейинги глюкоза (ммоль/л)	5
Юкламадан 2 соатдан кейинги глюкоза (ммоль/л)	9
Биринчи марта аниқланган қандли диабет	2
Холестерин (ммоль/л)	7
Триглицеридлар (ммоль/л)	4
Протромбин индекси	130
КФТВ	37
ХНМ	1,2
Фибриноген	3,5
Тромбоксан	18
ЖАМИ	14

This program was created by W.K. Kayumov and co-authors (DSU No. 06283. Registered in the State Register of Computer Programs of the Republic of Uzbekistan on April 19, 2019).

Digital program of preventive intervention for the main components of metabolic syndrome (indicators of negative dynamics of risk factors during preventive intervention)

The results of prevention should be as follows.

1. Significant reduction in the level of the main components of metabolic syndrome, that is, risk factors for cardiovascular diseases.
2. Decrease in the incidence of the main components of the metabolic syndrome.
3. Reducing cardiovascular risk.
4. Increasing the patient's commitment to a healthy lifestyle.

Conclusion. The prevalence of the main components of the metabolic syndrome, which are the main risk factors for cardiovascular diseases, is high and amounts to 63% among the unorganized population. In the unorganized population, there is a steady increase in the incidence of risk factors for cardiovascular

diseases. Currently available preventive technologies do not meet modern requirements and cannot achieve full results as a result of their use. Modern prevention of metabolic syndrome and cardiovascular diseases requires the use of software methods for calculating cardiovascular risk . In addition to personal communication, the positive effect of preventive intervention with the help of modern information and communication technologies and telephone messengers increases significantly, i.e. by 75%. The use of modern gadgets, diagnostic and preventive digital programs significantly increases the effectiveness of preventive measures. Among the unorganized population, the prevalence of the main components of the metabolic syndrome, which are the main risk factors for cardiovascular diseases, is high. In modern conditions, combining traditional methods with innovative information and communication technologies, it is possible to achieve a positive prevention effect of 80%.

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