

Measures To Improve The Medical And Organizational Aspects Of Preventing The Risk Of Developing Type 2 Diabetes In People Of Reproductive Age

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Abstract

Today, the problem of the prevalence of type 2 diabetes among the population of reproductive age is of particular relevance, and the issues of timely detection and prevention come to the fore when planning Federal programs to promote public health and extend active longevity. However, research shows that lack of effective use of existing technologies for medical prevention of risks of diabetes, high frequency of defects in prevention by doctors, as well as the reduction of the main quality parameters of doctors and their patients and differences in the cases of high and low effectiveness of risk prevention of diabetes, should form the theoretical basis for the development of the complex of organizational measures for the methods of quantitative evaluation of the quality and effectiveness of preventive work on the assessment and correction of risk of developing diabetes in the population of reproductive age. This article presents the organizational technology in the form of a new organizational form of work - the center for the compliant prevention of diabetes mellitus (Center for CPSD) among people of reproductive age and evaluates its effectiveness.

Keywords: diabetes mellitus, reproductive age, working-age population, prevention, organizational measures.

1. Introduction

According to the results of the NATION study, 24% of the adult population of Russia has prediabetes, 5.4% - type 2 diabetes, and half of them (54%) do not know about the presence of the disease [1,2].

In the “Concepts of demographic policy of the Russian Federation for the period up to 2025”, “Concepts of long-term socio-economic development of the Russian Federation up to 2020” the main activity of the health system is designated prevention, early diagnosis of the disease and informing the population. The frequent development of the disease at a young age increases the importance of the problem of preventing diabetes mellitus due to the risk of reproductive health disorders in women and men who have this risk factor for the formation of perinatal pathology and complications of pregnancy, maternal and perinatal mortality [3,4].

Much attention is paid to the issues of therapeutic training as an effective means of improving the

quality of medical and preventive care for patients with diabetes. The main provisions of therapeutic training include: providing the patient with the opportunity to master the skills that allow them to optimally manage their life with the disease; conducting it as a continuous process that should be integrated into the medical care system; centered on the patient; teaching “self-help” and psychological support for prescribed treatment [5,6.]. However, technologies for the prevention of DM2 among the reproductive population in the framework of training programs are not enough. Therefore, we can talk about the need to develop a technology for training high-risk individuals with prediabetes, as well as as a primary prevention to prevent the development of risk factors.

The aim of the study is - on the basis of a social and hygienic study, to develop a set of measures for the gradual prevention of the development of type 2 diabetes mellitus in people of reproductive age.

2. Materials and methods.

The studied phenomena: the morbidity of the population, the quality of medical care. Resources used: accounting and reporting medical documentation, specially compiled questionnaires, expert assessment cards, a personal computer. To estimate the coefficient of effectiveness of prevention of the risk of developing diabetes mellitus in the population of reproductive age, a mathematical method was used and a calculation formula was proposed.

3. Results and discussion.

In connection with the above problem of distribution of T2DM in the population of reproductive age, we developed and tested in the research in the Ivanovo Research Institute of Maternity and Childhood MoH a set of proposals for improving the prevention of the risk of diabetes in patients of reproductive age, which consists of the four directions.

The first direction is to improve the methodology for quantifying the quality and effectiveness of preventive work of doctors to assess and correct the risks of developing diabetes in the population of reproductive age.

The assessment of the quality level of prevention of the risk of developing diabetes mellitus provides for the introduction of the map “Model of expert assessment of the prevention of the risk of developing diabetes mellitus” (Table 1).

Table 1. Model of expert assessment of prevention of the risk of developing diabetes mellitus

Name of indicator	Evaluation
1. Adequacy of risk assessment of perinatal losses by factors associated with diabetes mellitus	1. 0-50% 2. 51-75% 3. 76% or more

2. Adequacy of screening for the presence of modified risk factors for diabetes mellitus (heredity, race, age)	1. 0-50% 2.51-75% 3.76% or more
3. Adequacy of screening for poor nutrition	1. 0-50% 2.51-75% 3.76% or more
4. Adequacy of screening for overweight and obesity	1. 0-50% 2.51-75% 3.76% or more
5. The adequacy of screening for the presence of a sedentary lifestyle	1. 0-50% 2.51-75% 3.76% or more
6. The adequacy of screening for the presence of addiction to smoking	1. 0-50% 2.51-75% 3.76% or more
7. Adequacy of screening for the presence of stressful behavior	1. 0-50% 2.51-75% 3.76% or more
8. Adequacy of screening for impaired glucose tolerance	1. 0-50% 2.51-75% 3.76% or more
9. Quality of planning and documentation of measures to prevent the risk of diabetes mellitus	1. 0-50% 2.51-75% 3.76% or more
10. The quality of training on the formation of skills for self-control of body weight parameters, blood sugar measurement, blood pressure	1. 0-50% 2.51-75% 3.76% or more
11. The quality of training to increase the level of knowledge about the risk factors of diabetes, their impact on reproductive health and the health of the born child, the possibilities of their correction	1. 0-50% 2.51-75% 3.76% or more
12. The quality of informing patients of reproductive age about the risk factors of diabetes mellitus, their effects on reproductive health, the course of pregnancy and the health of the born child, and the possibilities of their correction	1. 0-50% 2.51-75% 3.76% or more

13. The quality of measures to improve the compliance of patients of reproductive age to prevent the risk of diabetes mellitus	1. 0-50% 2.51-75% 3.76% or more
14. Adequacy of assessment of risks of health disorders of the born child by factors associated with diabetes mellitus	1. 0-50% 2.51-75% 3.76% or more
15. Adequacy of risk assessment of reproductive health disorders in patients by factors associated with diabetes mellitus	1. 0-50% 2.51-75% 3.76% or more
16. The adequacy of the choice of the model of interpersonal relationships between the doctor and the patient when carrying out measures to prevent the risks of diabetes mellitus	1. 0-50% 2.51-75% 3.76% or more
17. The number of reasonable complaints about the inadequate quality of prevention of the realization of the risk of developing type 2 diabetes mellitus	1. 0-50% 2.51-75% 3.76% or more

To assess the effectiveness of the prevention of the risk of developing diabetes in the population of reproductive age, it is proposed to use the proposed “Model of the final results of the prevention of the risk of developing diabetes in the population of reproductive age” (Table 2.).

Table 2. Model of the final results of prevention of the risk of developing diabetes mellitus in the population of reproductive age

Name of indicator	UoM	N	NA	Sign	Fact
1. The number of unrealized risks of perinatal losses by factors associated with diabetes mellitus	%	100	5	+	
2. Completeness of coverage of patients of reproductive age with screening for the presence of unmodifiable risk factors for diabetes mellitus (heredity, race, heredity)	%	100	5	+	
3. Completeness of coverage of patients of reproductive age with screening for improper nutrition	%	100	5	+	

4. Completeness of coverage of patients of reproductive age with screening for overweight and obesity	%	100	5	+	
5. Completeness of coverage of patients of reproductive age by screening for the presence of a sedentary lifestyle	%	100	5	+	
6. Completeness of coverage of patients of reproductive age with screening for the presence of addiction to smoking	%	100	5	+	
7. Completeness of coverage of patients of reproductive age with screening for the presence of stressful behavior	%	100	5	+	
8. Completeness of coverage of patients of reproductive age with screening for impaired glucose tolerance	%	100	5	+	
9. The number of patients of reproductive age who have achieved lifestyle modification in the direction of recovery	%	100	5	+	
10. The completeness of the coverage of patients of reproductive age with classes on the formation of skills for self-control of body weight parameters, blood sugar measurement, blood pressure	%	100	5	+	
11. The completeness of coverage of patients of reproductive age with measures to increase their knowledge about the risk factors of diabetes, their impact on reproductive health and the health of the born child, and the possibilities of their correction	%	100	5	+	
12. The level of awareness of patients of reproductive age about the risk factors of diabetes mellitus, their effects on reproductive health, the course of pregnancy and the health of the born child and the possibilities of their correction	%	100	5	+	

13. The level of motivation and compliance of patients of reproductive age to prevent the risk of diabetes mellitus	%	100	5	+	
14. The number of unrealized risks of health disorders of the born child by factors associated with diabetes mellitus	%	100	10	+	
15. The number of unrealized risks of reproductive health disorders in patients by factors associated with diabetes mellitus	%	100	10	+	
Total number of points:	70				

Symbols: N – standard value, NA-standard score in points, UoM-unit of measurement; OEI-deviations per unit of measurement.

The coefficient of effectiveness of prevention of the risk of developing diabetes mellitus in the population of reproductive age was calculated according to the formula proposed by us:

$$R_p = \frac{\sum PR \text{ (in points)} - \sum PD \text{ (in points)}}{\sum NU \text{ (in score points)}} \quad (1)$$

where: $\sum Pr$ – the sum of performance indicators in points; $\sum PD$ -the sum of defect indicators in points; $\sum NU$ – the sum of standard values of indicators in points.

The optimal level of the indicator is assumed to be 1,0.

The second direction is to improve the assessment and correction of patients’ readiness to prevent the risk of developing diabetes in the population of reproductive age. It includes:

Measures to ensure the preventive preparedness of patients receiving preventive services, including: a comprehensive assessment of the quality characteristics of patients using the “Scale of comprehensive assessment of preventive care preparation of the patient” and the test card; carrying out measures of targeted correction of controlled deviations of the patient’s readiness from the optimal level, including: targeted information of patients on the prevention of diabetes using a standard memo, individual correction of the patient’s lifestyle and medical activity.

The object of influence management at this stage is the qualitative characteristics of patients.

To determine the deviations of individual characteristics of patients from the ideal model, it is recommended to use the “Scale of comprehensive assessment of preventive preparedness of the patient” (Table 3).

Table 3. The scale of a comprehensive assessment of the readiness of a patient of reproductive age to prevent the risk of developing diabetes in the population

Specifications	Perfect level	Actual level
Social status		
Age	Up to 30 years old	1. over 50 years old 2. 30-50 years old 3. up to 30 years old
Level of education	higher	1. incomplete secondary education 2. secondary, special 3. higher education 4. higher medical education
Place of residence	city	1. village 2. city
Material well-being	high	1. low 2. average 3. high quality
Lifestyle		
Physical activity	high	1. low 2. medium 3. high
Hygienic activity	high	1. low 2. medium 3. high
Recreational activity	high	1. low 2. medium 3. high
Household activity	high	1. low 2. medium 3. high
Medical activity	high	1. low 2. medium 3. high
Motivation to maintain health	high	1. low 2. medium

		3. high
Personal status		
Temperament	Phlegmatic, seguiteci	1. Choleric 2. Melancholic 3. Sanguistic, phlegmatic
The orientation of the personality	Friendly	1. Authoritarian, 2. Dependent, 3. Friendly
Communication skills	high	1. low 2. medium 3. high
Conflict resolution	high	1. low 2. medium 3. high
Value orientations	High rank of "health" value	1. low rank of "health" value 2. middle rank 3. high rank
Awareness		
of Preventive maintenance	high	1. low 2. medium 3. high

With a score of 26-30, the patient should belong to the group of low readiness for the implementation of measures to prevent the risk of diabetes; 27-50 points - to the group of medium readiness; above 50 points – high.

To assess the level of awareness of patients on the prevention of DM, the test card "Level of awareness of patients on the prevention of DM" should be used, which determined the general knowledge of patients on the issue of DM2 disease, as well as the ability and skills of patients to determine the necessary indicators of changes in their health.

Determining the level of quality characteristics of the patient, his medical awareness and determining deviations from the ideal level of the parameters of these characteristics allows you to implement measures for their targeted correction, including: targeted informing of patients about the preservation of health and prevention of diabetes, individual correction of the lifestyle and medical activity of patients.

The third direction is to improve the assessment and correction of preventive training of doctors who provide preventive medical services to reduce the risk of diabetes. It provides for the following:

1. Assessment of the level of knowledge and skills of doctors on the prevention of the risk of diabetes, using the proposed test card; 2. Assessment of the quality characteristics of medical personnel according to the proposed scale using a test card (presented in the appendix to the dissertation); 3. Targeted correction of deviant characteristics of preventive training of medical personnel, for which you should use the memo given below, as well as an educational and methodological complex, including thematic lectures, scientific and practical seminars, booklets, and a list of recommended literature.

The assessment of the preventive readiness of medical personnel is carried out according to the scale developed by us (Table 4).

Table 4. The scale of comprehensive assessment of the preventive readiness of the doctor

Specifications	Perfect level	Actual level
The age of the doctor	30-50 years old	1. over 50 years old 2. 30-50 years old 3. up to 30 years old
Doctor's information culture	high	1. low 2. medium 3. high
Deontological culture of the doctor (speech culture and ineffective tactics of interaction with the patient)	high	1. low 2. medium 3. high
Work experience in the speciality	Up to 30 years	1. 1-3 years 2. 4-9 years 3. 10 years or more
Qualification category	higher	1. the second or not 2. the first 3. higher
The coefficient of the doctor's readiness to prevent the risk of diabetes mellitus	High (more than 0.84)	1. less than 0,71 2. 0,72-0,84 3. 0,85-1,0
Legal awareness	high	1. low 2. medium 3. high
Job satisfaction	high	1. low 2. medium

		3. high
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If the number of points is 12-18, the doctor should belong to the group of low preventive readiness; 19-21 points - to the group of average readiness; above 22 points – high.

The fourth direction includes improving the organization of early diagnosis and correction of the risks of developing diabetes.

The proposed new organizational forms of work - center of compliant prevention of diabetes (Center CPD) technology “Compliant prevention of diabetes” for men and women of reproductive age, the Program part-time education (school level (patient-doctor) in a medical facility, and the school of the second level (the population of reproductive age well-respected specialist) information specialized medical portal - “diabetes and reproduction”, a mobile therapeutic and preventive module.

The Center for the Compliant Prevention of Diabetes Mellitus (CCPD Center) is organized on the basis of the regional endocrinology center and has the purpose: to coordinate measures for monitoring and correcting risk factors for diabetes mellitus. The staff structure of the center includes: an endocrinologist (head of the center), an obstetrician-gynecologist, a general practitioner, a methodologist, 4 nurses, a computer operator (the regulations on the CCPD Center are presented in the appendix). In the conditions of this center, the technology “Compliant prevention of diabetes” is implemented for men and women of reproductive age, which includes 7 stages:

1. Assessment of the amount of knowledge and skills necessary for the patient, taking into account the level of his medical awareness according to the test data;
2. Conducting medical awareness of the patient about the risk factors for developing diabetes, the impact of their reproductive health, the performance of reproductive function, the course of pregnancy and the health of the born child.
3. The formation by the patients’ of skills and abilities necessary for assessing the level of blood sugar, BMI, blood pressure, stress levels, planning a healthy diet and quitting smoking.
4. Assessment of the patient’s motivational readiness to participate in the prevention of risk factors for diabetes, its compliance and commitment.
5. Correction of negative motivation and improvement of the patient’s compliance level through the implementation of individual programs of psycho-somatic correction.
6. Assessment and correction of medical-social and medical-organizational risks of failure of successful compliance of patients for the prevention of diabetes.
7. Assessment of the success of the correction of the risk of diabetes, changes in the medical awareness of patients, their medical activity, lifestyle modifications, knowledge and skills for the prevention of diabetes, positive motivation to participate in preventive measures, increasing confidence in the doctor, increasing his authority.

This technology is implemented on 2 levels:

1. First-level school (patient-attending physician) in a medical institution based on full-time and part-time training with the attending physician;
2. School of the second level (population of reproductive age-highly authoritative specialist) on the information specialized medical portal - "Diabetes and reproduction". It is based on the involvement of the most authoritative specialists in a dialogue with patients on various aspects of the formation of a healthy lifestyle, conducting trainings on the correct formation of self-control skills for key indicators of diabetes risk.

To increase the availability of endocrinological care to patients in remote areas, it is proposed to use a mobile treatment and prevention module. The purpose of the module is primary and secondary prevention of diabetes and its complications. The module is designed to ensure the availability of screening for the risk of developing diabetes to people living at a considerable distance from the regional center.

Analysis of the results of the approbation of the measures for improvement of early diagnosis and correction of risk of developing diabetes) has shown its effectiveness, expressed in reducing the number of realized risks, reduce the percentage of premature births, raising the level of medical activity of women, their health awareness, improving preventive training of doctors, improving the prevention of diabetes risks in the population of reproductive age

On the basis of medical organizations of the Moscow region, an experiment was conducted to introduce a set of proposals to improve the prevention of the risk of developing diabetes. To ensure the first strategy, all levels and methods of hygiene education were involved. Among the patients of the territory, standard leaflets-memos were distributed, which drew attention to the need to visit a doctor for preventive purposes. There were radio and television presentations on prevention issues. Field seminars on topical issues of prevention and treatment were organized. The attention of the audience was drawn to the role of personal contact between the doctor and the patient, in the implementation of sanitary and educational measures.

The results showed that the implementation of medical and organizational measures significantly reduced the number of defects in the violation of succession and continuity of prevention, under-registration of medical documentation and determination of the risk of diabetes ($p=0.02$). Among the causes of defects in prevention, the frequency of such a cause as "professionalism of the doctor" significantly decreased ($p=0.04$).

4. Conclusions

A set of proposals for improving the prevention of the risk of diabetes among patients of reproductive age, including such areas as: improving the methodology for quantifying the quality and effectiveness of preventive work of doctors assessment and correction of risk of developing diabetes in the population of reproductive age; improving the assessment and correction of readiness of patients to the prevention of

the risk of development of diabetes in the population of reproductive age; improving the assessment and correction of preventive and preparedness of physicians providing preventive health services to reduce the risk of DM - represented in the progress of the experimental conditions ensured the achievement of health and social efficiency, expressed in reducing the realized risk of diabetes by 14%, a decrease in the percentage of preterm birth by 5.6%, raising the level of medical activity of women by 17%, medical awareness at 46%. The results of the survey showed that measures of educational-methodical and psychological correction of the personal qualities of awareness of physicians and patients, the rate of complex assessment of preventive preparedness of doctors increased by 25% of patients at 18%, and, in conjunction with other medical and organizational activities, which increased the effectiveness of preventing the risk of DM in General is 14%.

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