Ways of Increase the Quality of Population Medical Examination for the Early Detection of Cardiovascular Diseases

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Abstract: An early detection of CVD and the cardiovascular risk factors allows us to start the drug treatment of patients, thereby reducing the mortality and disability rates of the population in Russia. One of the fundamental principles of the CVD early detection is the screening studies carried out within the framework of medical examination and the preventive examinations of the population. Medical examination of the population, which was started in all Russian regions in 2013, built on a two-step algorithm of examination using an extended volume of instrumental and laboratory tests, has allowed us to substantially improve the indices for the early detection of patients with high level of the CVD risk. This article identifies the main problems and deficiencies in the organization of medical examination of the population, the basic measures for its improvement are determined.

Key words: Risk factors · Medical examination · Preventative maintenance · Screening, chronic non-communicable disease · CVD risk assessment

INTRODUCTION

One of the main causes of death in the developed countries is a cardiovascular disease (CVD): annually they claim the lives of 17.3 million people [1]. Among the socially significant diseases in Russia the CVDs rank first. They are cause the significant health damage and often lead to severe and irreversible physical and neurological disability. Despite the fact that such are incurable diseases as a primary prevention (i.e. preventing) and the secondary prevention (i.e. slowing the progression) of CVD much can be done by eliminating the modifiable risk factors [2]. Over the past few years the prevalence of the traditional cardiovascular diseases risk factors are increasing in the large populous countries in the developing world, including Russia, with the consequent increase in the incidence of coronary and cerebrovascular events [3].

The preventive examination (screening) of the population allows us to reveal the hidden pathological processes and to provide an early treatment of asymptomatic patients with a high risk of CVD diseases [4]. The cardiovascular diseases screening is applied in many countries around the world. The large-scale screening examinations (early diagnosis of diseases) that cover the large population groups are recommended by the leading world experts and applied in many countries of the world [5].

At the same time, the approaches taken to the early CVD detection and the organization of medical examination of population cannot be considered as enough effective because the cardiovascular complications are still the most common cause of hospitalization and death [6]. Thus, the search for ways to improve the medical examination system for the early CVD detection is particularly relevant.

In Russia, the death rate from the cardiovascular diseases amounts 55.4% [7]. Moreover, about 30% of lethal cases occur in people under the working age - 35-65 years old. Many of them die suddenly without experiencing any serious problems with the heart or blood vessels. In the Republic of Dagestan, the structure of mortality is no different from the All-Russian: the most significant cause of death is also the heart disease: in 2012 the death rate due to cardiovascular disease in the Republic was 239.4 per 100 thousand people (42.3% of all mortality cause) [8].

The most common complications of CVD, such as: death, myocardial infarction and stroke, in most cases occur suddenly, in this connection, many therapeutic
interventions are impossible or bring only a weak short-term positive result. As practice shows, the preventive examinations (screening) for the early detection of cardiovascular diseases and their risk factors provide the greatest effect. The experimental tests and the observational studies of population give us the basic risk factors: smoking, diet and nutrition, physical activity, lipids, hypertension, diabetes as well as social and psychological factors [9]. According to the international and Russian recommendations, in addition to tests on the diseases detection, the screening programs should also include the tests to determine the risk factors.

The main high-performance medical technologies to the health preservation and reducing of disability and mortality are the mass medical examination and the regular preventive medical examinations of population.

By the Federal Law "On the basis of health protection in the Russian Federation" the medical examination is defined as "a set of measures, including a medical check by doctors of several specialties and applying the necessary methods of examination carried out in respect of certain population groups in accordance with the legislation of the Russian Federation" [10].

The beginning of history of the medical examination of population in Russia is considered to be 1986, when, in accordance with the order of the USSR Ministry of Health in the clinics were opened the preventive prevention offices and rooms, the hospital routine staff (district doctors and pediatricians) was extended laboratory and instrumentation were improved.

The sudden social and economic reforms in the 1990s of XX century, have led to a catastrophic situation in Russia as in the economy as in the social sphere. The clinical examination ceased to exist having, there has been a significant deterioration of health of the population and increase in mortality from the cardiovascular disease (Figure 1).

In 2006 within the framework of the national project "Health" an attempt to revive the medical examinations was done. Only the employees of public sector aged 35-55 years old had to pass the medical examination. In 2008, the program was expanded and already covered the entire working population of the country, including the employees of commercial companies. Since 2010, the new rules of passing the medical examination by the state and municipal employees began to act.

It should be noted that the established Russian system of medical examination was a typical example of a complex periodic preventive examinations and, according to the scientific facts and the analysis of rich experience of countries that have achieved the significant success in the preventive medicine, such examinations cannot lead to a decrease in mortality [11]. The general annual examination eventually has been ineffective due to the high cost and the resource intensity. Another one serious disadvantage of the established system of medical examination of population was the fact that in most cases the medical examination consisted only in the examination and detection of diseases without further correction of CVD risk factors and without the implementation of the medical and preventive complex and the rehabilitative measures that can be applied already in the medical examination process [12].

The modern approach to the general medical examination of population, started in Russia in 2013, takes into account not only the positive, but also the negative experiences of the past, well as the international recommendations, including for the prevention of cardiovascular diseases. The principal differences between the general medical examination in 2013 and the previous examinations of population lies in the fact that it is differentiated by age and sex of the subjects, the district principle of citizens examination is entered and the possibility to pass it not only by working people, but also the elderly, unemployed people, as well as by the students in the educational institutions.

The financial support for the activities by medical examination of the citizens is carried out within the framework of the basic CHI (compulsory health insurance) program for expense of subventions of the Federal Fund of CHI. By the Program of state guarantees to provide the free medical care to citizens for 2013 and the planning period of 2014-2015, approved by the Resolution of the RF Government [13], the standard volume and the standard of financial costs per unit of help volume in the outpatient setting with the preventive purpose per one insured, including his visit associated with the medical examination.
is set. Annually the standard of volume and the standard of financial costs for the medical care with the preventive purpose increases.

The new procedure of the medical examination of the adult population provides the two-step principle of its holding:

In the first stage (screening) CNCD signs, risk factors and their development, use of narcotic drugs and psychotropic substances without a physician using the standardized questionnaires are detected, as well the indication for tests completion and medical examinations are identified, a brief prevention counseling is carried out;

The second stage of the medical examination includes:

- The diagnosis clarification, the health state group of dispensary observation definition, if necessary;
- Referral for the additional examinations (outside the medical examination), conducting a thorough preventive counseling.

It is known that for the most of CVD is typical a hidden course during the initial stages. Therefore, in the period between the medical examinations that is 3 years, the probability to miss the cardiovascular diseases development beginning is quite large. In this regard, the Art. 46 of Health Act provides the examination of preventive medical examination (screening), which includes the less than the amount of medical examination survey volume is conducted by one stage by the therapist not more frequently than once every two years. The procedure for their carrying out is approved by the Order of Russian Ministry of Health dated 06.12.2012 #. 1011n.

According to the results of screening the population, passed the medical examinations, is divided in three groups [14]:

- To the I health group the citizens with no proven diseases with the low and middle cardiovascular risk as determined by the scale of SCORE belong. To such citizens we carry out brief prevention counseling, the correction of risk factors by the physician in the office (room) of medical prevention or the Health Centre;
- To the II health group the citizens with no proven diseases with the high or very high cardiovascular risk belong. To such citizens we carry out the CNCD risk factors correction in the office (room) of medical prevention or the Health Centre, when you have the medical evidences, the therapist prescribes drugs for the management of risk factors, these citizens are subject to dispensary observation in the office (room) of medical prevention;
- To the III health group the citizens with отнoят граждан имеющих proven diseases that require the dispensary observation or the specialist care capacities, including the high-tech and also the citizens with suspected of having the disease, which requires an additional examination. The citizens of this group, who have the CNCD risk factors, shall be provided with their correction in the office (room) of medical prevention or the Health Centre.

In general over Russia in the medical examination holding are involved 3,500 outpatient polyclinics, more than 38,000 of district therapists, more than 2,000 of medical teams. Annually, starting from 2013, about 26 million people (taking into account the most probable 50% of the response, the volume of people, who will be examined will be about 13 million people) are subject to medical examination.).

Currently, the medical examination of population goes in all regions of the country. One of leading positions in coverage of examinations and testing of the population among all regions of Russia occupies the Republic of Dagestan. The large-scale campaign by medical examination of the adult population started in the Republic of Dagestan in March 1, 2013. The adult population of the country is more than 2030000 people. In 2013, we are planning to cover with the medical examination about 29.8%, or 605765 people.

As at 10.03.2013, the execution plan for the individual medical examination of the adult population in the republic was 83.1% (Figure 2), which is in 1.8 times higher than the average Russian indicator - 45.4%.

During March-August 2013 the doctors of the Republic of Dagestan covered with the medical examination 339,804 people, of whom for the first time was identified the CNCD at 19.6% of the citizens, who passed the fully completed medical examinations for the reporting period.

Almost 30.7% of the surveys had a high and very high risk of cardiovascular diseases in the absence of clinically significant diseases [15]. Over the Russian Federation this index was 22.7%. More than 39.5% of the surveyed population of the Republic of Dagestan have the CVD risk factors (overweight, irrational feeding, high blood pressure, physical inactivity, tobacco and alcohol consumption, hyperglycemia, high cholesterol) that is 129107 people, while 31.7% of the citizens have two or more risk factors (average Russian indicator - 24.9%).
In general, the main results of a new program of medical examination of the population, the examinations with an extended instrumental and laboratory tests volume, including the preventive counseling on its results, show us the effectiveness of spent actions.

Per each 2,000 people (average number of therapeutic area) was found:

- 84 patients with the arterial hypertension and 64 people requiring a clarification
- 26 patients with the ischemic heart disease and 15 people requiring a clarification

The medical examination with the two-step algorithm of examination allows you to define a diagnosis at the early stages of cardiovascular diseases and the subsequent therapeutic (and diagnostic) tactics.

At the same time, the organization of medical examination of the adult population in regions, particularly in the Republic of Dagestan, has a number of disadvantages and unsolved organizational problems:

- Insufficient number of preventive Cardiological Departments at the general sufficient quantity of the Medical prevention Subdivisions
- Insufficient coverage with the preventive examinations and the medical examination of rural population.

In order to improve the quality of carrying out the medical examination for the early cardiovascular diseases detection you should:

- To develop the infrastructure for the medical prevention (establishment of centers for the medical prevention of CVD, offices / rooms of medical prevention in hospitals and sanatorium institutions with the cardiological profile), with the necessary financial, material and technical equipment to conduct the medical examination and preventive examinations;
- To conduct the medical examination, counseling and treatment of population in the remote and inaccessible settlements is expedient to use the multidisciplinary brigades (visiting groups of medical specialists), to develop the mobile complexes (mobile feldsher-midwife stations (FMSs), outpatient clinics, outpatient modules, sanitary aviation), equipped with the necessary medical equipment. For the purpose of personnel maintenance for the mobile complexes work you can attract interns and medical residents;
- Implementation of distance forms to detect the CVD risk factors using the risk assessment scales.

According to the Russian guidelines for the cardiovascular prevention, the overall cardiovascular risk is calculated by the European scale of SCORE. The patient can independently calculate his risk group using the online risk assessment tools, such as SCORE. The risk level calculation on the Internet can be made without entering of cholesterol or blood pressure values. Evaluation of patients at high risk group can be made taking into account the use of already existing clinical data on the population by creating a list of persons based on the evaluation of the vascular risk that will allow
doctors to assist the timely service to the priority patients and thus cost savings. The given approach requires the creation of a secure electronic database of patients and, therefore, a significant financing; however, the creation of such database will provide a rational approach to the identification patients in need of more urgent treatment [16]. Another way of evaluation for the patient is to place the integrated calculators to calculate the risk on the sites of medical institutions that automatically provides the estimates of the product based on data extracted from the electronic patient records.

REFERENCES