S.I. Sofronova, A.N. Romanova

ASSESSMENT OF TOTAL CARDIOVASCULAR RISK AMONG INDIGENOUS POPULATION OF YAKUTIA'S ARCTIC ZONE

DOI 10.25789/YMJ.2018.63.26

ABSTRACT

Data on the high frequency of arterial hypertension in the indigenous population of the Arctic zone of Yakutia, reaching 57.5% in the Anabar region, were obtained. It is established that the 10-year risk of death from cardiovascular complications increases in people with arterial hypertension. The high risk of developing cardiovascular complications dictates the need for further in-depth study of all factors affecting the formation of public health in hard-to-reach areas of Yakutia.

Keywords: arterial hypertension, total cardiovascular risk, indigenous population, Yakutia.

Cardiovascular diseases in Yakutia, as well as in general across Russia, hold a leading position in the pattern of population mortality causes (45,4%). According to Goskomstat data, from 2013 to 2015 the circulatory diseases rate of all population remains on the same level, and the mortality decreased slightly (by 0,9%) [1]. In spite of the fact there is a declining trend of the mortality rate of circulatory diseases (403,7 in 2013, 406,5 in 2014, 386,7 in 2015 on 100 thousand people of the population), the mortality from coronary artery diseases tends to increase (152,3 in 2013, 162,7 in 2014, 167,5 in 2015 on 100 thousand people of the population), including a myocardial infarction (23,6; 23,2; 37,7 respectively).

Nowadays, there are more than 200 risk factors of atherosclerosis development and progression. For complex accounting of their influence and possible interactions, the strategy of assessment of total cardiovascular risk was widely adopted. In clinical practice, the Framingham Risk Score and the Systematic Coronary Risk Evaluation (SCORE) are used the most frequently. The scale of Systematic Coronary Risk Evaluation (SCORE) is developed for fatal cardiovascular disease risk assessment within 10 years. Data of the cohort studies are served like a basis for a scale in 12 countries in Europe (including Russia), with the total number of 205,178 people [2, 3].

Research objective: to assess total cardiovascular risk among indigenous population of Yakutia's Arctic zone.

Materials and methods of the research

In the furtherance of the goal, an expedition to the remote districts of the Arctic zone of the Republic (Tomponsky, Nizhnekolymsky, Srednekolymsky, Verkhnekolymsky, and Anabarsky) was organized. Screening of adult population with participation of the cardiologist, neurologist, endocrinologist, primary care physician, gastroenterologist, ultrasonographer, endoscopist is carried out. In total, 686 people aged from 20 up to 70 years are examined. From among the examined persons 529 people – representatives of indigenous people of Yakutia (Yakuts, Yukaghirs, Evens, Evenks, Dolgans, Chukchi) were selected (Table). Conditionally, these districts were divided into three zones: Tomponsky District (Tompo), Kolyma group of uluses (Kolyma), and Anabarky District (Anabar). The selection was formed according to the lists of workers which are in administration of the settlements. The response made 76%. Average age of the respondents was 45,59±0,55 years.

Inclusion criteria: representatives of indigenous people of Yakutia (Yakuts, Dolgans, Evens, Evenks, Chukchi, Yukaghirs).

Exclusion criteria: representatives of non-indigenous nationality.

The research took place according to the YSC Ethical Committee Protocol of the informed consent of the respondent to processing of personal data and the research.

Arterial hypertension is present if blood pressure is at 140/90 mmHg (according to the Society of cardiology of Russian Federation Committee of experts, 2004, 2009).

The program of the research includs the following sections: the questionnaire poll for assessment of an objective state; the informed consent of a respondent to carrying out researches, blood donation; anthropometric examination with measurement of body height and body weight; blood sampling from basilic vein in the morning on an empty stomach with 12-hour continence from nutrition.

Laboratory methods of the research included blood lipids test (TC, TG, HDL Cholesterol, LDL Cholesterol), glucose test.

In the poll about smoking, smokers are considered persons who are smoking, at least, one cigarette per day within the last 12 months (Neaton J.D., 1992).

The technique of determination of total cardiovascular risk by SCORE is given in Figure 1. That part of the scale, which corresponds to a gender, age, and the status of smoking of the respondent is chosen. Further, the ABP (mm Hg.) and TC (mmol/l) systolic is considered. The number in the found cell shows the 10-year total cardiovascular mortality risk of the respondent. Level of total cardiovascular risk on the scale of SCORE is considered: less than 1% - low, from >1 up to 5% - average or moderately raised, from >5% up to 10% - high, >10% - very high.

Statistical data processing was carried out by means of standard methods of mathematical statistics, using the software package of SPSS (version 17.0). Data are submitted as M±m where M – average value of the sign size, and m – an average error of the sign size. Intergroup

General characteristics of the indigenous population of Yakutia's Arctic zone by ethnicity

	Yakuts	Dolgans	Evens	Evenks	Yukaghirs	Chukchi
Total	119	85	141	67	77	40
Men (%)	30 (25,2)	26 (30,6)	51 (36,2)	13 (19,4)	34 (44,2)	20 (50)
Women (%)	89 (74,8)	59 (69,4)	90 (63,8)	54 (80,6)	43 (55,8)	20 (50)
Average age	48,94±0,99	44,93±1,56	43,02±0,98	48,37±1,64	46,49±1,54	39,73±1,93

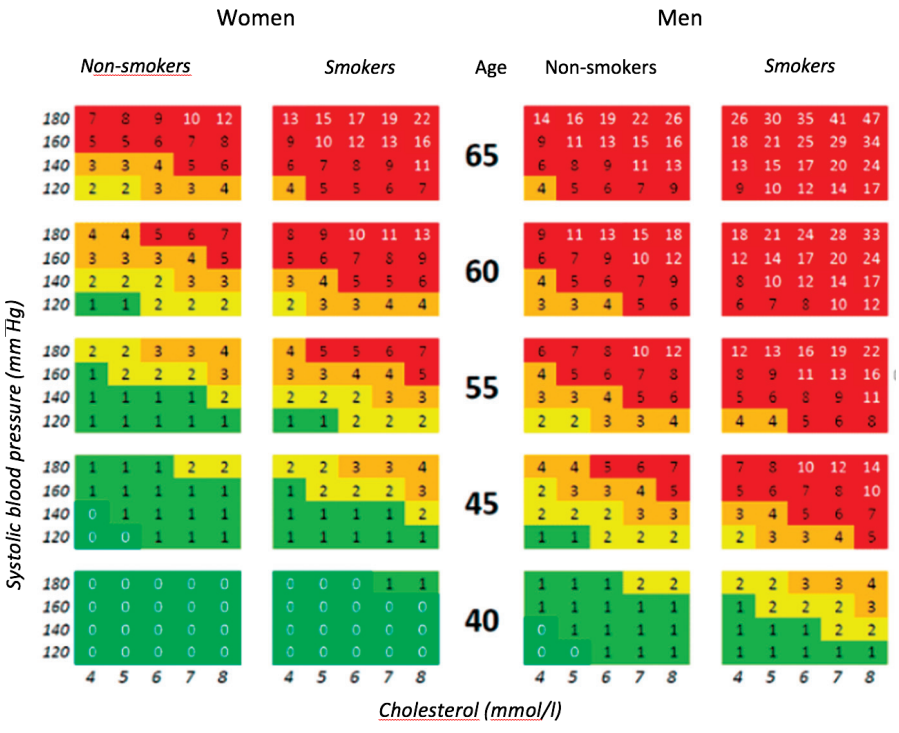

Fig.1 Scale of fatal cardiovascular disease risk assessment within 10 years SCORE (%).

differences were estimated by means of the variance analysis or nonparametric criteria. The differences were considered as statistically significant at p<0,05.

Results and discussion

By the results of complex medical examination among more than a half of the population in the explored districts, there is a high prevalence of arterial hypertension from 50,4% in the Tomponsky District up to 57,5% in Anabar (Fig. 2). Arterial hypertension occurs in men of the Kolyma group often than in women (62,9% versus 36,4%). In other districts, hypertension occurs more often in women (difference statistically insignificant). Generally, essential hypertension stage II was registered. Perhaps, so high frequency of arterial hypertension is caused by low medical literacy of the population, monotherapy priority of antihypertensive drugs, lack of the effective combined antihypertensive drugs of the last generation.

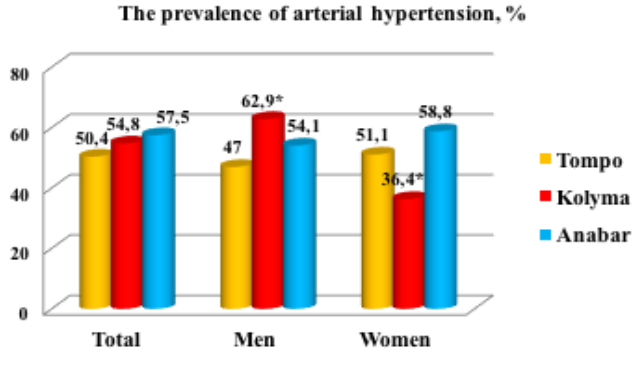

Fig.2 The prevalence of arterial hypertension in the adult population of Yakutia's Arctic zone.

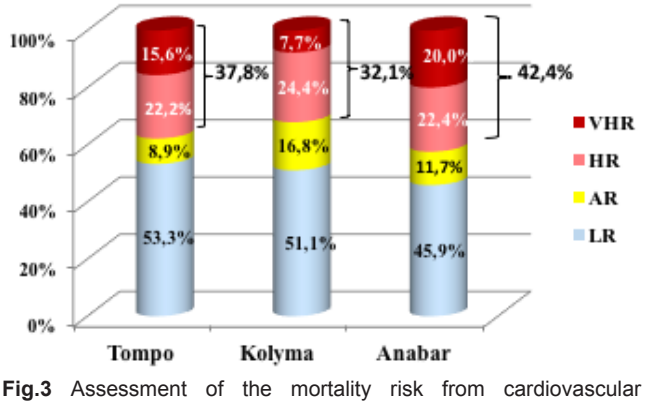

Fig.3 Assessment of the mortality risk from cardiovascular complications in the next 10 years on scale SCORE in the overall population.

Here and below: LR – low risk, AR – average risk, HR-high risk, VHR- very high risk.

We carried out the assessment of the 10-year mortality risk from cardiovascular complications using SCORE scale in the overall population and the persons with arterial hypertension. For determination of risk from among the respondents, persons aged from 40 up to 65 years were selected: from the Tomponsky District (n=89) of the Kolyma group of uluses (n=139), the Anabarsky District (n=205). Frequency of high and very high mortality risk from cardiovascular complications in the next 10 years (>5%) in the overall population was from 32,1 to 42,4% (Fig. 3). Total mortality risk increases in the persons with arterial hypertension: 54,9% in the Tomponsky District, 45,5% in the Kolyma group, 58,1% in the Anabarsky District (Fig. 4).

Conclusion

Thus, we obtained data of the high frequency of arterial hypertension among indigenous people of the Arctic zone of Yakutia. Sometimes, arterial hypertension is hardly corrected by antihypertensive drugs monotherapy. It is established that with arterial hypertension is one of the reason for increasing the 10-year mortality risk from cardiovascular complications. Transport remoteness, change of traditional tenor of life, a dreary carbohydrates and fats nutrition, high cost of products of plant-based food, and also the lack of the modern, effective, combined hypotensive drugs lead to the steady increase of the incidence of circulatory diseases, resulting in such terrible complications

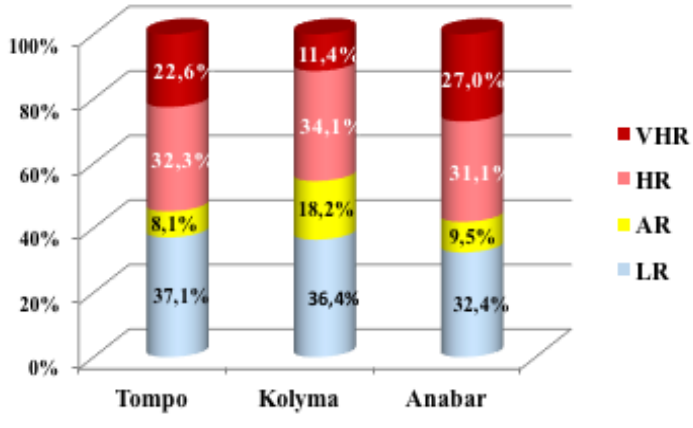

Fig.4 Assessment of the mortality risk from cardiovascular complications in the next 10 years on scale SCORE in people with arterial hypertension.

as coronary heart disease and a cerebral stroke. The high risk of development of cardiovascular complications dictates need of further profound studying of all factors influencing formation of health of the population in the remote districts of Yakutia.

The research was carried out within the framework of the research work of the YSC CMP "The contribution of the metabolic syndrome to the development of atherosclerosis of coronary arteries in Yakutia residents" and the research and development of new technologies for the treatment and prognosis of the risk of arterial hypertension and stroke in the Republic of Sakha (Yakutia) "(State Contract No. 1133).

References

1. Sakha (Yakutia) stat. Zdravoohranenie v Respublike Saha (YAkutiya): Statisticheskij sbornik [Health in the Republic Sakha (Yakutia): statistical collection]. Yakutsk, 2016, 159 p.
2. Conroy R., Pyörälä K., Fitzgerald A. [et al.] Estimation of ten-year risk of fatal cardiovascular disease in Europe: the SCORE project // Eur Heart J. 2003 Jun; 24(11):987-1003.
3. Guy De Backer, Ettore Ambrosioni, Knut Borch-Johnsen [et al.] European guidelines on cardiovascular disease prevention in clinical practice: Third Joint Task Force of European and other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of eight societies and by invited experts) // European Heart Journal, Volume 24, Issue 17, 1 September 2003, Pages 1601–1610.

The authors

YSC CMP, Yakutsk, Russia:
1. SOFRONOVA Sargylana Ivanovna - PhD, head of department, sara2208@mail.ru;
2. ROMANOVA Anna Nikolaevna - MD, director, ranik@mail.ru.

T.K. Sunkharylova, V.V. Dodokhov, N.I. Pavlova, Kh.A. Kurtanov

GRAVE'S DISEASE. MODERN REPRESENTATIONS AND DISTRIBUTION IN THE TERRITORY OF THE REPUBLIC OF SAKHA (YAKUTIA)

DOI 10.25789/YMJ.2018.63.27

ABSTRACT

The article presents historical and modern ideas about Graves' disease (GD), new approaches in treatment and diagnostics and the results of studies of foreign and domestic scientists on the role of genetic factors in the development of GD. In the Republic of Sakha (Yakutia), the share of GD in the structure of endocrine pathology ranks 2.3%. The Arctic regions are in the first places by the frequency of occurrence of GD.

Keywords: thyroid gland, Graves' disease, thyrotoxicosis, genetic markers, genetic predisposition.

Diffusive-toxic goiter (DTG) is an autoimmune disease with a genetic predisposition. Violations are inherited from parents to children. A persistent pathological increase in the production of thyroid hormones is due to thyroid-stimulating antibodies, which are more active than thyroid hormones, and last longer. In fact, antibodies simulate the action of the natural thyroid hormone, they are able to enhance the synthesis and secretion of thyroid hormones. Antibodies are formed as a result of the development of the body by «incorrect» T-lymphocytes (suppressors), which, instead of controlling the adequacy of the immune response, begin to destroy the thyroid gland.

The first mention of this disease was made in 1722 - the Irish doctor Ives S. and then in 1786, described in more detail the English physician Parry (1786). The most famous description of this disease was made in 1835 by Robert Graves, and in 1840 by the German doctor Karl Bazedov, who described in more detail about 4 cases of the disease and classically classified the so-called «Merzebur tribes», characteristic symptoms of bladder, goiter and tachycardia.

The opinion of researchers about the genetic conditionality of this disease diverge, the authors believe that the days are inherited by the AR type, others by the AD type, and some - by the fact that there is a multi-factor (polygenic) type of inheritance.

Genetic studies show that if one of the monozygotic twins is ill with diffuse toxic goiter, then for another, the risk of getting sick is 60%; In the case of dizygotic pairs, this risk is only 9%.

Outstanding domestic clinician S.P. Botkin (1884) wrote about the role of mental trauma, both on development and the course of DTG. Also, according to the data of the Soviet endocrinologist N.A. Shereshevsky, 80% of patients with this disease had a history of mental trauma. V.G. Baranov and co-authors (1961) established a connection with a trauma in 7.5% of the 480 respondents with this disease. And according to Trotter (1962), etc., the mental trauma has no clear connection with the development of the disease.

Scientists also suggest the relationship between the development of DTG and the provision of the body with zinc. In the studies of D.S. Vinchenko (with co-authors, 2016) showed that in patients with diffuse-toxic goiter in 70% of cases, the level of zinc in the hair is reduced [12].

Autoimmune diseases of the thyroid gland, including DTG and AIT, are common and affect up to 5% of the population as a whole. Over the past decades, there has been significant progress in understanding the genetic contribution to the etiology of autoimmune thyroid diseases. Several genes of susceptibility to these diseases have been identified and characterized. So the genes of predisposition to DTG, AIT, and genes to both of the above diseases were found.

It is believed that DTG is a disease in which genetic features of immunity are realized against the background of environmental factors such as stress, viral infections, the use of antiviral drugs, excess in the body of iodine.

The first locus of the susceptibility gene to autoimmune thyroid diseases was the locus of the human DR leukocyte antigen (HLA-DR) genome [26].

At present, close cohesion of a number of large histocompatibility complex antigens (DW3, CW4, B8, WHO, B27, A3, AT A28) and DTG has been established. In most cases, the presence