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The Characteristics of Metabolic Syndrome Manifestations in Different Ethnic Groups

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Annotation: The modern data about the prevalence, ethnic characteristics of the metabolic syndrome and its main components (abdominal obesity, hypertension, dyslipidemia and hyperglycemia) in different ethnic groups from Europe, America, Asia and Russia are presented in the review of scientific literature.

Keywords: metabolic syndrome, ethnic characteristics, abdominal obesity, hypertension, dyslipidemia, hyperglycemia.

Metabolic Syndrome (MS) is complex metabolic disorders (abdominal rhenium, arterial hypertension, dyslipidemia, impaired carbohydrate tolerance, impaired system hemostasis, chronic subclinical inflammation), etiopathogenetically related to each other and atherosclerosis development and progression cardiovascular diseases, sugar type 2 diabetes. [23]

According to epidemiological studies, about 300 million people in the world have metabolic syndrome, and, according to WHO experts, in close the next 20 years is expected to increase the number of patients on fifty%. Thus, world civilization will face tackled the new "21st Century Pandemic," which advocated as the leading cause of the formation of cardiovascular diseases and their complications (MI, incult) leading to high mortality and a decrease quality of life for people aged 40-60 years [8].

It should be noted that there are a number of methodological problems in studying the epidemiology of MS, which are associated with the lack of a single definition this state [15]. Currently not offered less than 10 definitions (criteria) of MS, but none of them today is not generally accepted [4]. Lack of coherence in various definitions. controversy over the interpretation of epidemyological research. So, in the work of L. Guize and et al., where MS was determined by three criteria: NCEP (2001), revised criteria of NCEP-R (2005) and IDF (2005), its prevalence increased from 10.3% (NCEP) to 17.7% (NCEP-R) and 23.4% (IDF) [22].

At the same time, regardless of the evaluation criteria, metabolic syndrome, its prevalence of significantly increases with age and has sexual, ethnic and regional differences, with age and ethnicity play a crucial role [5]. The IDF Declaration (2005) emphasizes the relevance of the study of manifestations of MS in various ethnic groups to further complement and refinement of the criteria for this condition. A review of foreign literature allows us to highlight some features of the manifestations of metabolic syndrome in ethnic groups from Europe, America and of Asia. In the population of South Asia, primary insulin resistance is not possible, whereas in The United States is dominated by obesity. in Europe - atherogenic dyslipidemia, and in African American countries - arterial hypertension (AH) [7]. At Japanese and Brazilians of Japanese descent along with the

traditional components of MS insulin persistence is closely related to the activity of factor VII coagulation and low cholesterol level of lipoproteins density (HDL-C) [24,26].

The most complete data on the prevalence of MS by various criteria and in various ethnic groups represented in studies that were made in the USA in the 80-90s. One of the leading of investigations in this aspect was phase 3 of the study NHANES (NHANES III) [17]. The study is carried out elk between 1988 and 1999, was estimated mixed the largest population of 8814 adults (white, mexican and faces of the black race). Total Distributed - MS in the USA according to NCEP criteria was 23.8%. The prevalence of MS was highest among Mexican ethnic group (31.9%) and low among the white race (23.8%) and African-Americans (21.6%).

Prevalence did not differ much among white males. Rank and women, while among the African American in women, the prevalence of MS was 57% higher than men, and Latin American women origin - 26% [20]. According to the same following, revealed that the most common- my components of the metabolic syndrome are obesity (especially in women) and arterial hyper tension, the incidence of hyperglycemia was significant much less.

In the next phase of the NHANES study the same population in the period from 1999 to 2002, it was established Leno, about 12 million US residents over 40 years old have diabetes mellitus (DM). According to this data, the prevalence of MS among people with type 2 diabetes type was 68.6%, was not detected statistically differences between the three ethnic groups- However, differences in individual components MS. So, abdominal obesity is more common

It happened in people of the white race (80.6%) suffering from type 2 diabetes, than African-Americans (67.8%) ($p = 0.008$). Increase triglycerides (TG) were more often detected among white race and mexican ethnic group.

On the contrary, hypertension was more often observed in individuals of the black race as among people with diabetes (73.1%) and without it (47.5%) [25].

Following the advent of the 2005 IDF criteria, strangeness of MS in the NHANES population 1999-2002 was counted among 3601 people over the age of

20 years old [21]. According to the NCEP criteria, the total prevalence of MS was 34.5% in the general group, and according to IDF criteria - 39.0%. Authors made conclusion that IDF criteria unreasonably overestimate MS prevalence in the United States, especially among Mexican Kan ethnic group [17].

In 1987-1989 ARIC study was included 15792 people from 4 US states aged 45-64 years. The prevalence of MS according to the criteria of APR III 24% for women and 23% for men. Moreover, women The prevalence of MS was higher among African the American population (28% versus 23%), and in men, on the contrary, among people of the white race (18% versus 24%). 60% individuals of the black race had AH, and only 23% - among whites.

A significant increase in waist circumference (OT) is more often due to was noted in women (59% versus 31%), and in 75% of women of black race. Prevalence fasting hyperglycemia ranged from 8 to 15% at times personal racial groups. Increased risk associated go with MS was 2.55 for women and 1.51 for men [17, 19, 27].

In Canada, 1276 people from 4 ethnic groups were examined groups [18]. The prevalence of MS was 25.8% and significantly varied in subpopulations:

41.6% among Indians, 25.9% among South Asia, and 22.0% among Europeans, compared with 11.0% among immigrants from China ($p = 0.0001$).

Study on the study of ethnic especially- MS was also performed in the UK in the period from 1988 to 1991 [29]. Study participants between the ages of 40-69 were mixed West London population: 2346 European, 1711 South Asians and 803 from Africa and from the Caribbean. MS was evaluated according to the criteria WHO and NCEP. MS prevalence was most high in the Asian subgroup (WHO: men 46%, women 31%; NCEP: men 29%, women 32%), and the lowest among European women (WHO - 9%; NCEP - 14%).

In addition to the high prevalence of MS, in contrast from the European population to the Asian population the presence of insulin resistance is also characteristic with lower body mass index (BMI) and OT and genetic predisposition to sugar diabetes [17].

In 1998, with the support of the Ministry of Health Singapore's injuries [28] were carried out by the national risk factor prevalence study cardiovascular disease [17]. Study included 4723 people of various nationalities (54% of Chinese, Malays and Asian Indians) grows from 18 to 69 years. The prevalence of MS is estimated based on NCEP criteria (as modified for the Asian population). Overall prevalence the syndrome was 18.2% (20.9 in men and 15.5 in women -chin). The highest prevalence was in Indians (28.8%) and Malays (24.2%), and the lowest – at Chinese subpopulation (14.8%) ($p < 0.001$). In a number of regions of Russia, epidemiological studies to study common cardiovascular risk factors, MS and its components in different ethnic groups. In 2007-2009 years GNITs PM together with the Ministry of Health of the Chuvash Republic was carried out simultaneous epidemiological study to identify MS in the case of sample (about 1500 people aged 39-69 years) Cheboksary. This study identified MS features. The study included Chuvash nationality (67.7%), Russians (29.5%), representatives of other nationalities set <3%. MS prevalence analysis among the two nationalities that make up the majority, shows that among Russian MS is detected more often by compared with the Chuvash. Among the Chuvash, MS was identified in 18% of cases, while among Russians every fourth had the main symptoms of MS ($p < 0.05$). Among men of Chuvash nationality in 12% of cases MS, among men of Russian nationality this the indicator is significantly higher - 19% ($p < 0.03$). Among women Chuvash nationality prevalence MS 2 times more often - 22.6% compared with men - 11.7% ($p < 0.0002$). Among Russian men and women the prevalence of MS is not statistically different and is 19% and 26.4%, respectively [7.14].

From 1999 to 2001 in the Kemerovo region (mountain Shoria) a simultaneous epidemiological a research study that examined 1215 people (550 Shors and 665 non-Shors) aged over 18 years old. 97.5% of the non-Shore group were represented in Russian and 2.5% - persons of other nationalities (Ukrainians, Germans). In general, the frequency of MS was components , but the structure of risk factors in subgroups is significant varied significantly. It is shown that in Mountain Shoria with high frequency components of the MS are common only among representatives of the alien population, and among them, in women.

Abdominal obesity (AO) non-Shoreans took place 8.1 times more often than root residents, hypoalphacholesterolemia - 2 times, impaired glucose tolerance (NTG) - 2.4 times. AT prevalence of hypertriglyceridemia (hyperTG) and AH national differences were not found, however- however, in the analysis of blood pressure differences revealed differences in average levels of both GARDEN and DBP, manifested in their higher values among representatives of Shor nationality. It was also shown that whose insulin resistance was more often reported in representatives of non-indigenous nationality. It is you- at higher values among non-Shore people immunoreactive insulin (IRI) and C – peptide [10]. Features of insulin resistance have been identified and in other regions of Russia. V.M. Podhomutnikov (2001) found in the indigenous population of the Altai Mountains

higher IRI values than in Mountain Shoria, and K.G. Nozdrachev (1999), exploring the Evenki population, set, on the contrary, lower IRI and C-peptide among both indigenous people and among representatives of the alien population. Comparable levels of analyzed indicators were recorded E.G. Stepanova et al. in Chukotka [10].

In 1999-2000 and in 2005-2006. were held simultaneous epidemiological studies among the alien and indigenous population of Nyda villages, Men, Se-Yah of the Yamal-Nenets Autonomous Okrug [12]. A total of 2445 people were examined of their own age, the newcomer population was 1397 indigenous people - 1048 people. It was found that the prevalence of MS in the newcomer population laziness is almost 2.5 times higher than in the radical population population (21.7% versus 9.2% ($p < 0.001$)), as among men and women. In the alien population

The rural population of the Far North is the most common options for MS are: option 1 - a combination of AO, AG and hypoCHS-HDL, is common over the past 7 years increased by 1.2 times

(from 8.0% to 9.6%); option 2 - a combination of AO, AG, hypoCHS-HDL and hyperTG, prevalence increased 1.6 times (from 3.4% to 5.6%, p <0.05); option 3 - a combination of AO, AG, hyperTG, a 1.2-fold increase in prevalence (from 2.6% to 3.8%).In the indigenous population

The Far North is dominated by a variant of metabolic syndrome - a combination of AO, AH and hypoCHS-HDL (5.6%), in second place is the combination of AO, AG and hyperTG (1.4%) in third place - a combination of AO, AG, hyperTG and hypoCHS-HDL (1.0%). For 7 years of significant dynamics in the prevalence of the studied variants of MS among no indigenous populations. Alien men unlike indigenous men, the average values of OT, total cholesterol (OXS), blood TG, SBP and DBP much higher, and HDL-C blood cholesterol lower. Lipidogram in alien male population is more atherogenic character than native men. Among women with MS, a more unfavorable situation in wearing average values of the studied components MS. So, newcomers have higher indicators of OT, OXS, TG and DBP than that of indigenous women chin.

In dynamics for 7 years (1999-2000 and 2005-2006) in the populations of newcomers with MS are worse lipid profile indices in the form of a significant decrease the effects of HDL-C and increased blood TG. In the population alien women experienced an increase in blood TG and DBP level. In the indigenous population of individuals with metabolic syndrome in dynamics over 7 years the average TG values increased significantly; blood cholesterol-HDL level, increased average level of SBP [12].

In Bishkek [1] a study was conducted to study features of MS in two ethnic groups: persons of sky (55 people) and Kyrgyz nationalities (59 people) aged 38 to 67 years. By frequency criterion criteria for MS differences between Kyrgyz and Russian ethnic groups are not identified. Kyrgyz men compared to Kyrgyz women We were statistically significantly more likely to experience hyperTG. Differences in the frequency of occurrence of MS components in there were no Russian men and Russian women.

By frequency the occurrence of the criteria of MS in 1st place is worth three component, then four-component and five-component MS. Kyrgyz with a three-component MS the most common combination of hypertension, low the level of HDL cholesterol and obesity, with a four-component Mr. joins hyperTG, with a five-component- violation of carbohydrate metabolism (NUO). Russian with three-component MS - with the same frequency of hypertension and low levels of HDL-C and HDT, with four component obesity joins, with five nentnom - NUO. The main factors affecting on the severity of atherosclerotic lesions extracranial carotid arteries, with many factor regression analysis taking into account ethnic among Russian patients are diabetes, the level of OXS, BMI and burdened heredity, and Kyrgyz people have obesity, apo-B, DBP, age, and TG [1].

A study was conducted in the Republic of Sakha (Yakutia) to study the characteristics of MS in indigenous people working peoples (96 Dolgans and 90 Evenks) of working ages from 30 to 59 years living in with. Yuryung-Haya from. Ezhantsy. With a comprehensive assessment of metabolic JIS criteria syndrome for various ethnic groups, AHA III and GFCF (2009) in indigenous people of Yakutia suffering from arterial hypertony, revealed a significant increase in the frequency of MS (from 66.3% to 73.8%) by all criteria, compared with a group of people without hypertension (from 8.5% to 17%).The association of arterial hypertension with MS is more pronounced in women.

Statistically significant differences are often found you are AO, increase OXC, LDL-C, hyperglycemia in Dolgans and Evenks suffering from hypertension compared with individuals without hypertension. Increased Abdominal Obesity more pronounced in women. In general, the components of MS in individuals with arterial hypertension in blowing sequence: 77.5% - increase in cholesterol LDL, 72.5% - increase in total cholesterol, 71.3% - AO $_{80\text{-}94}$, 53.8% - AO $_{102\text{-}88}$, 45% - decrease in α-cholesterol, 41.3% - hyperglycemia, 31.3% - hyperTG. And the components of the MS in individuals without arterial hypertension: 48.1% - higher low LDL cholesterol, 41.5% - decrease in blood α-cholesterol, 37.7% - increase in total cholesterol, 32.1% - AO $_{80\text{-}94}$, 24.5% - hyperTG, 17.9% - AO $_{102\text{-}88}$ and hyperglycemia. In women without AH AO was 6.3 times more common than in men same groups [13].

In another study conducted in Yakutia, studied the severity of coronary atherosclerosis and its risk factors in men root and non-indigenous nationality of Yakutia. According to the results of KKG it

was noted that in men of non-indigenous nationality, more severe multivascular coronary lesions compared with men indigenous nationality [11].

In addition, in the Republic of Sakha (Yakutia) studied national (ethnic), age and gender blood lipid profile, body mass index (BMI) in patients of older age groups (elderly, senile age and long-livers) of indigenous and non-indigenous nationality with coronary heart disease. It was revealed that non-indigenous people significantly higher atherogenic lipids detected blood and low density lipoproteins, and also a higher BMI compared to the indigenous population [2].

Ethnic differences in MS manifestations were studied. 67 women of Russian (age 53.9 ± 0.91 g) and 33 women of Korean (55.6 ± 1.21 g) nationalities living in the Sakhalin region. It was found that women of Russian nationality body mass index, the level of OXC, cholesterol-LDL and TG was higher, and the level HDL-C was significantly lower than that Korean women. In women of both groups, impaired glucose tolerance with a significantly higher frequency among women of Korean nationality (30.3% versus 22.4%) [9].

In the Baikal region and in the Republic of Buryatia A number of studies have been conducted in which the ethnic characteristics of the main risk factors for coronary heart disease and hypertension. So, from 2001 to 2004 in Ulan-Ude M.N. Shedoeva carried out simultaneously study that included 804 people indigenous (Buryats, Evenks) and 1,608 non-indigenous people (Russians, Tatars, Ukrainians) nationalities of Ulan-Ude aged 49 to 79 years. In the course of this study, it was found that the prevalence of hypertonic disease the population was equal among men and women (37.4%). Indigenous women had hypertonic disease is less frequent (28.3%) than men (41.1%), while non-indigenous women had hypertonic disease more often (41.6%) than men (36.6%). When identifying ethnic subgroups, it turned out that the Buryats, Tatars, Russians had a relatively equal frequency of hypertonic disease, then as the Evenks have a lower incidence of the disease.

The prevalence of dyslipoproteinemia (DLP) in the whole population was high (67%), equal to among men and women. When studying the differences was revealed that women of indigenous ethnic groups DLP is relatively less common than in women indigenous ethnic groups, with relatively equal the frequency of DLP among men. The level of atherogenic lipoproteins was significantly higher in non-indigenous population, and the level of HDL-C is in the indigenous ethnic group, moreover, in Buryat women, the level of HDL-C was HD-my tall. It was also found that of Tatar ethnic group significant an excess of fasting blood glucose compared to relationship with representatives of other ethnic groups. In addition, representatives of non-indigenous population's significantly higher urinary content blood acids with a higher degree of reliability in Russians [16].

In a study by Z.Kh. Malakshinova in the city of Ulan-Ude [6], other data were obtained on the prevalence of hypertension in different ethnic groups. So it was recorded more often in Buryats than in Russians, and this the increase was due to DBP. At the same time, data on the ethnic characteristics of dyslipidemia were are similar. So, according to this study, cholesterol levels, LDL-C and TG increase with age as in the Buryats, Russians have the same, however, national differences in their concentration are noted only in individual age groups. So, statistically significant national differences in cholesterol levels were found only in the age group of 30-39 years, where the Buryats are 10 mg / dl lower than the Russian ($p < 0.05$). The level of HDL-C in HD is higher in all age groups than in Russians ($p < 0.05$). And the TG level in the Buryats turned out to be statistically significantly lower in age groups 30-39 years old and 40-49 years old than Russians 13.2 mg / dl and 12.6 mg / dl, respectively ($p < 0.05$). At drill the level of LDL-C was significantly lower than that of Russians, only in the group of 30-39 years old ($p < 0.05$).

Another study conducted by V.V. Kireeva's Baikal region to identify ethnic characteristics of risk factors for coronary heart disease. The study included 118 patients of Buryat and 117 Russian nationalities suffering from coronary heart disease. According to this study, dyslipidemia occurs in Buryat patients much less than in Russian patients (66% against 83.8%, respectively, $p < 0.05$). Indicators of OXC, TG, X-LDL and the atherogenic coefficient are significantly higher in Russian group of patients compared with Buryat, which does not contradict the above data on similar research. The level of HDL-C at the Russians and the Buryats did not statistically differ. In both

groups, it was recorded that the largest share was 2a and 2b types of DLP, respectively, the smallest share - 3 and 4 types of DLP. In Russian men, DLP is registered in 86.6% of cases, which is significantly more than that of the Buryats - 61% ($p < 0.05$). Significant ethnic differences in the impact of such a risk factor as excess body weight or obesity for the development of coronary heart disease. Results studies have shown that Buryat patients with ischemic heart disease suffer from increased body weight or obesity statistically significantly more often (68.6%) than Russians (53%). The following ethnic differences in the effects of overweight and obesity were also recorded: 50-59 years old, overweight and obesity are more common among Russians, and at the age of 70-79 years old - among Buryats. BMI the Buryats are significantly more than the Russians. During the study, there were no ethnic differences in the frequency of occurrence of the metabolic syndrome - in Buryats it was detected in 50%, and in Russians - in 41% cases, while the differences between the groups are not significant. On the other hand, when considering a combination The following differences were found in the components of the metabolic syndrome: in Russian hyperTG in combination with reduced HDL-C, there is significant more often (68.8%) than Buryats (32.2%). In Buryat and Russian groups did not find differences in this risk factor, like arterial hypertension (AH). Arterial hypertension in patients with coronary heart disease in compared cohorts occurs equally often 74.6% - in Buryats and 77.8% - in Russian, $p > 0.05$ [3].

So, studies conducted in our country and abroad, testify that it is common metabolic syndrome is large, it depends on the criteria used to diagnose MS, the age of patients, ethnic and regional characteristics. On the territory of the Baikal region to date, only individually taken risk factors for coronary heart disease have been studied and no work was done to study the ethnic characteristics of the metabolic syndrome as a whole. Between the Baikal region is distinguished by multinational composition of the population and unique climatic conditions, which causes great interest in terms of studying the metabolic syndrome and its components.

The relevance of the study of MS is also due to the potential reversibility of this condition with timely and adequate treatment. The establishments of ethnic features of MS in the Baikal region will be help improve patient care and prevention of severe metabolic complications syndrome.

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