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COMPARATIVE CHARACTERISTICS OF CARDIOMETABOLIC DISORDERS IN THE WORKING POPULATION OF INDIGENOUS AND NON-INDIGENOUS NATIONALITIES OF YAKUTIA

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A pilot study was conducted in the expeditionary conditions of the working population of the Anabar and Aldan districts of the Republic of Sakha (Yakutia). Arterial hypertension was registered equally frequently in more than half of the respondents. More than half of the respondents had abdominal obesity, and it was more often detected in non-indigenous men and women of indigenous nationality. Abdominal obesity and arterial hypertension are associated with atherogenic dyslipidemia in the indigenous population, most often in women. In non-indigenous people, regardless of gender, obesity correlated with TG levels and blood glucose, arterial hypertension with the same indicators in non-indigenous women.

Keywords: arterial hypertension, abdominal obesity, lipid metabolism, indigenous and non-indigenous population, Yakutia.

Cardiovascular pathology and obesity pose a serious threat to the health of populations all over the world. Arterial hypertension (AH) is the most common cardiovascular pathology, its complications making a significant contribution to mortality. The scale of its spread in Russia has risen from 39.2% to 45.7% in a 20-year period of observations [2]. An epidemiological study conducted earlier in Yakutia revealed a 30.3% prevalence of hypertension in the population of the republic [5]. In recent years, studies have been conducted to research its spread mainly among the indigenous population, including indigenous small-numbered peoples, the frequency reached 54.3% [7; 9].

The prevalence of obesity in the world raises serious concerns. The scale of its spread is pandemic in nature. According to WHO, 650 million adults and 340 million children are obese [10]. According to the ESSE-RF study, its prevalence in Russia reaches up to 36.3% in men and 52.3% in women [4]. The study of the prevalence of obesity among the indigenous and non-indigenous population of the northern territories of Russia showed a lower prevalence among indigenous people [6]. The historically estab-

lished way of life and the nature of nutrition among the indigenous peoples of the North have been undergoing global changes in recent decades. Considering the above, the study of cardiometabolic disorders in indigenous small-numbered peoples and non-indigenous residents of Yakutia is undoubtedly relevant.

Aim of the study: A comparative analysis of cardiometabolic disorders in the employed population of indigenous and non-indigenous nationalities in Yakutia.

Materials and methods. A single-stage pilot study of the employed population of the Republic of Sakha (Yakutia) was conducted. According to the employment lists, every third employee of the Aldan district (southern zone), where the mining industry is highly developed, and the Anabar district (northern zone), where diamond deposits have been mined in recent years, participated in the study. The response rate was 76%. The analysis was carried out, there were 380 study participants, including 180 non-indigenous and 200 indigenous people. In the Aldan district, the study was conducted among employees of an industrial enterprise, representatives of non-indigenous nationality (Russians, Ukrainians, etc.), in Anabar - social, housing and communal services employees of indigenous nationality, mainly represented by indigenous small peoples (Evenks and Dolgans). For comparative analysis, 2 groups were formed: indigenous and non-indigenous residents. The average age was 45.03 ± 0.84 years for indigenous people, 44.37 ± 0.86 years for non-indigenous people ($p=0.587$). In the group of people of indigenous nationality, there were 145 women, 55 men; in

the group of non-indigenous nationalities 111 and 69, respectively. They were comparable in age for analysis. The average age of indigenous men was 45.07 ± 1.82 years, non-indigenous 45.03 ± 1.4 years ($p>0.05$), indigenous women 45.02 ± 0.93 years, non-indigenous 43.95 ± 1.10 years ($p>0.05$).

A comprehensive study of the population included a questionnaire, which reflected complaints, past illnesses, family history, living conditions, social status, diet, bad habits, etc.; an anthropometric study measuring height and weight, waist (WC) and hips circumference (HC). An examination by a general practitioner and a cardiologist with the measurement of blood pressure (BP) was carried out. Blood sampling from the vein was carried out on an empty stomach with a 12-hour fasting interval after the last meal. The study participants signed a voluntary consent form for the examination in accordance with the Protocol of the Ethics Committee of the YSC CMP.

Values of WC > 94 cm in men and > 80 cm in women indicate abdominal type of obesity [3].

Arterial hypertension was established (AH) at a blood pressure level $\geq 140/90$ mmHg or when constant use of antihypertensive drugs was prescribed [1;11].

Laboratory research methods included: determination of lipid metabolism (total cholesterol (TC), low-density lipoproteins (LDL), high-density lipoproteins (HDL), triglycerides (TG)), and blood glucose.

Statistical data processing was carried out using the SPSS STATISTICS software package (version 26.0). Qualitative variables are described by absolute and

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relative frequencies (%), quantitative by means of the mean and standard error of the mean, median (Me) and interquartile range (Q1-Q3). The proportions between the groups were compared using the nonparametric Spearman criterion χ^2 . The odds ratio (OR) and 95% confidence interval (95% CI) were used to calculate the relationships. Spearman's coefficient was used for correlation analysis. The statistical significance of the differences (p) is less than 5%.

The work was carried out within the framework of the research of the YSC CMP "Regional specifics of normal and pathological biochemical, immunological and morphological indicators in the indigenous and non-indigenous population of the Republic of Sakha (Yakutia)" (FGWU-2022-0014).

Results and discussion. For the analysis of anthropometric indicators, the comparison of the average values of WC depending on ethnicity and gender was carried out. In men, the average WC index was higher with a statistical difference among representatives of non-indigenous nationality and amounted to 97.09 ± 1.46 cm in comparison with indigenous men (91.84 ± 1.58 cm) ($p=0.017$). As for the female population, the average WC index was above the reference values in both groups and had no statistical difference, for indigenous women it was 90.99 ± 1.19 cm, for non-indigenous 88.69 ± 1.47 cm ($p=0.223$).

More than half of the respondents have a high incidence of abdominal obesity (AO), for the indigenous population it was 70% ($n=140$), non-indigenous 66.7% ($n=120$) (OR 1.16; 95% CI [0.75-1.79], $p=0.485$). In gender comparison, AO was slightly more common in non-indigenous men compared to indigenous men - 62.3% and 47.3%, respectively (OR 0.54; 95% CI [0.26-1.11], $p=0.094$). In women, the opposite results were obtained, regardless of ethnicity, there is a high incidence of AO. Indigenous women were 1.5 times more likely to have AO without a statistically significant difference (78.1%), compared with non-indigenous women (70%) (OR 1.53; 95% CI [0.87-2.69], $p=0.141$).

Thus, the analysis of anthropometric data showed a high incidence of AO in both groups, which is most prominent in non-indigenous men and indigenous women. The global changes in lifestyle, traditional principles of nutrition, low physical activity are most characteristic of women, representatives of the indigenous peoples of Yakutia. The results are consistent with the studies of A.I. Kozlov, who showed the prevalence of obesity

among the indigenous small-numbered peoples of the North, which is similar with the national data [8].

A correlation analysis of the conjugacy of WC with indicators of the lipid and carbohydrate spectrum, depending on gender and ethnicity, was carried out (Table 1). In indigenous men, significant conjugacy was obtained with LDL and TG, in the non-indigenous with TG and blood glucose. In women of indigenous nationality, a significant correlation was obtained with all indicators, except for TC. In non-indigenous women, as in men of the same ethnicity, WC positively correlated with the level of TG and blood glucose.

Correlation analysis showed the greatest association of AO with atherogenic dyslipidemia in the indigenous population, the most characteristic for women. In people of non-indigenous nationality, regardless of gender, AO correlated with TG levels and blood glucose. The close association of obesity with TG and glucose levels has also been confirmed in general population studies of ESSE-RF [4].

Given the epidemic nature of obesity among the study participants, a study was conducted on the presence of hypertension. It was revealed that more than half of the participants had hypertension, equally often in both indigenous and

non-indigenous populations - 54.2% and 56.4%, respectively (OR 0.91; 95% CI [0.61-1.37], $p=0.667$). The mean systolic blood pressure (SBP) was 137.01 ± 1.70 mmHg in the indigenous population with a significant difference compared to the non-indigenous population, whose SBP was 130.22 ± 1.65 mmHg ($p=0.004$).

A gender comparison of the incidence of hypertension showed that men of non-indigenous nationality without significant differences were more likely to have hypertension compared to indigenous men (62.3% and 50.9%, respectively) (OR 0.62; 95% CI [0.30-1.28], $p=0.202$). In women, on the contrary, the opposite values were obtained. In indigenous women, hypertension was registered slightly more often (55.5%) compared with non-indigenous (52.7%) (OR 1.11; 95% CI [0.67-1.83], $p=0.662$).

Next, a correlation analysis of systolic blood pressure (SBP) with the parameters of lipid and carbohydrate metabolism, depending on gender and ethnicity, was carried out (Table 2). The indigenous male population has the greatest conjugacy with the level of TG, no correlation was obtained in non-indigenous men ($p>0.05$). As for the female population, the association of SBP with the levels of TC, LDL and TG was obtained in indigenous women. In non-indigenous women, SBP correlated with the con-

Table 1

Correlation analysis of WC with lipid spectrum and blood glucose by Spearman, depending on gender and ethnicity

WC		TC	HDL	LDL	TG	glucose
men	indigenous	r	0.095	0.100	0.312	0.253
		p	0.129	0.144	0.000	0.065
	non-indigenous	r	0.035	-0.078	-0.031	0.262
		p	0.510	0.138	0.561	0.000
women	indigenous	r	0.110	-0.418	0.201	0.479
		p	0.186	0.000	0.015	0.000
	non-indigenous	r	0.121	-0.167	-0.010	0.308
		p	0.207	0.081	0.917	0.001

Table 2

Correlation analysis of SBP with lipid spectrum and blood glucose by Spearman, depending on gender and ethnicity

SBP		TC	HDL	LDL	TG	glucose
men	indigenous	r	0.004	-0.013	-0.047	0.291
		p	0.999	0.925	0.736	0.031
	non-indigenous	r	0.009	-0.053	-0.011	0.198
		p	0.943	0.667	0.926	0.102
women	indigenous	r	0.433	0.108	0.402	0.262
		p	0.000	0.193	0.000	0.001
	non-indigenous	r	0.024	-0.101	-0.070	0.300
		p	0.803	0.296	0.468	0.001

centration of TG and blood glucose, no significant correlation was obtained for other parameters.

Thus, a high incidence of hypertension was revealed in both indigenous and non-indigenous populations, confirming the close relationship between hypertension and obesity, which was confirmed by earlier ESSE-RF studies [4]. When compared by gender, it was more often registered with an unreliable difference in non-indigenous men and indigenous women. AH correlates most significantly with lipid metabolism disorders in indigenous women.

Earlier studies conducted by Russian scientists proved a lower prevalence of obesity and hypertension in the indigenous population compared to non-indigenous residents of the northern and Arctic territories of Russia [6]. Our study showed the alignment and sometimes deterioration of some indicators of the cardiovascular system, obesity and lipid profile in the indigenous population of Yakutia.

Conclusion. The results obtained allow us to confirm that there is a change in the state of health of the indigenous peoples of the North. Our pilot study partially refutes the previously conducted research results on the most favorable profile of lipid disorders in the indigenous population compared with non-indigenous. Cardiometabolic disorders are equally common among the working population of Yakutia, regardless of ethnicity, and sometimes even more common among indigenous people. Arterial hypertension was registered with the same frequency in indigenous and non-indigenous populations. Abdominal

obesity is more common in non-indigenous men and indigenous women. The relationship between the development of arterial hypertension with TC and its atherogenic fractions in representatives of indigenous peoples of the North, TG and blood glucose in non-indigenous women was obtained.

The male population in places of compact residence of indigenous small-numbered peoples of the North still retain occasional physical activity, engaging in reindeer husbandry, hunting, fishing. The health of the female population raises concerns due to a decrease in motor activity, changes in the traditional nature of nutrition (mainly carbohydrate-fat), an increase in the influence of gadgets in everyday life, etc. Further monitoring of the health status of the employed population with a comprehensive preventive approach to weight loss, promotion of healthy eating, sports, timely drug therapy of existing diseases of the cardiovascular system is required.

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