A.I. Fedorov, T.M. Klimova, V.I. Fedorova, M.E. Baltakhinova

Nutrition and Lifestyle of Indigenous Rural Population of Yakutia

ABSTRACT

On sample of indigenous rural population research of a nutrition, physical activity, and monthly level of the income, the social status and anthropometrical indexes is carried out. At a significant proportion of the surveyed population against an unbalanced nutrition and insufficient physical activity signs of the metabolic disorders bound to the raised mass of a body are observed. High degree of prevalence of overweight and obesity, probably, is a consequence of a misbalance between energy consumption and energy costs.

Keywords: indigenous population, lifestyle, nutrition, physical activity, metabolic disorders, overweight, obesity.

INTRODUCTION

The prevalence of overweight and obesity over the past decade has increased significantly. Among Russians, the proportion of working-age people who are overweight is 25-30%, but with varying degrees of obesity - 15-25%. (Antsiferov, 2007), (Grandfathers, 2006). Obesity is the result of an excessive accumulation of adipose tissue in the body and the associated violations of the functional activity of adipocytes. Adipocytes produce 30 hormonal factors involved in the regulation of metabolism and energy (Santa 2004). Obesity is also related to risk factors such social diseases as hypertension, coronary heart disease and type 2 diabetes. The main reasons leading to obesity are excessive amounts of high calorie foods and combined with a reduction in energy costs, in particular physical activity. The prevalence of obesity will vary in different populations, depending on the ethnic and socio-economic factors (Gurov, 2010). In this connection it is necessary to examine the prevalence of overweight and obesity in specific regions and population groups. It should be noted that the prevalence of overweight - state before obesity poorly understood (Antsiferov, 2007). The purpose of this work is to determine the nature of the nutrition and lifestyle of the indigenous rural population to improve methods of prevention of obesity and metabolic disorders.

MATERIALS AND METHODS

In 2013-2014 within the framework of international cooperation programs Research Institute of Health NEFU and Northwestern University, USA, conducted a joint field work to study lifestyle, nutrition, metabolic status of the indigenous population of Yakutia. During the surveyed representatives of 210 adults (151 female and 59 males aged 20 years and older). Of those in the age group 20-39 years - 40 people, aged 40-59 - 103, aged 60 and over – 67. The average age of those surveyed was 52 years. The study protocol was approved by the local Committee for Biomedical Ethics at the Yakut Scientific Center of complex medical problems, SB RAMS (Protocol №16 of 16.04.2009). The study was conducted under the condition of voluntary informed consent of participants by trained personnel. The examination program included a survey of a questionnaire on socio-demographic characteristics of respondents voltage (and frequency of consumption of certain foods), physical activity, participation in traditional activities, doubling the measurement of blood pressure, anthropometric and biochemical research. Measuring height (body length) was performed using a standing stadiometer to the nearest 0.1 cm. The body weight (up to 100 g), and body composition (fat percentage and weight, fat-free mass, muscle mass and bone)

was determined using bioimpedance analyzer "Tanita SSC 330" (Japan). Skinfold thickness was measured by calipers by a standard technique. Body mass index was calculated as the ratio of the body weight (kg) by height (m^2). When assessing the body mass index using WHO criteria (WHO, 2000). Waist circumference was measured in a standing position in the middle of the distance from the bottom edge of the costal arch to the iliac crest, with an accuracy of 0.1 cm. Hip circumference measured in a standing position at the level of the greater trochanter. The work was conducted in the framework of the base part of the public task of the Ministry of Education and Science of the Russian Federation №3052 «Adaptive capacity, values and settings to preserve the health of the indigenous population of Yakutia" (state registration number 01201460280).

Statistical analysis was carried out in an environment of the application package IBM SPSS Statistics version 22. Assessment conjugation qualitative characteristics were performed by using chi-square test of Pearson (χ^2) with a threshold level of significance 0.05.

RESULTS AND DISCUSSION.

Results of the participants social status study showed that the proportion of families was 66%, unmarried - 16%, widowed - 12%, and divorced - 6%. The average number of family members was 4 persons. The average household income of respondents was at the level of 44 thousand rubles per month, and the individual - 23 ths. rub. The monthly incomes of the majority of respondents (84%) were equal to the minimum subsistence level or exceed it. The main source of income for 31.4% of the population surveyed is wages, and 41.4% - wages plus pension. Health status was assessed by 63% of respondents as "average" and as "good" - 23%. According to a questionnaire survey of 50% of the surveyed population had high blood pressure, 21% - fasting hyperglycemia, 9% - type 2 diabetes.

Results of the analysis of sources of food have shown that the needs of the township 80% met through purchases in the store (Table 1). The share of production of domestic origin in the nutrition of the population surveyed an average of 18%. Help families to provide food and occupy a small share of total needs. The demand for meat and dairy products only 11-27% was met by farms. The sources of vegetables and berries were basically home vegetable garden and harvesting of wild berries.

Table 1

Results of the study diet showed that the majority of respondents most frequently consumed baked products, animal fats and meat (Fig.). From vegetables every day half of the respondents used the onions. The most popular drink is tea. Every third respondent consumed sweets daily. Least Eat foods are fruits, berries, eggs and fish.

Fig. The percentage of respondents who use daily individual food

Physical activity of the Berdigestjah population mainly formed from an agricultural labor, gardening and livestock care, collecting wild berries, hunting and fishing. These activities are seasonal in nature with the exception of animal care. Picking berries is engaged 82% of the population, backyard gardening - 77%, hay - 33%, animal care - 17%, and hunting and fishing - 29%. The duration of the seasonal physical activity an average of 7 to 15 days at year, except for backyard gardening. Daily physical activity of the working population is low. Most of the persons interviewed during the working day in the main sitting. The population of working hours in a sitting position holds 4 hours, while after hours on foot walking accounts for only about 1 hour. Only 35% of respondents during the

working day primarily go and carry little weight, are engaged in heavy physical labor 8%. Thus, only 43% of the working population is showing a significant physical activity during the workday. Physical exercise are not engaged or involved in very rare 38% of respondents, of which 15% limit physical activity for medical reasons. Daily physical work for 20-30 minutes until slightly sweating engaged only 15% of those surveyed, while 1 per week - 12%. Lack of physical activity can be one of the causes of diseases of the cardiovascular system and metabolic disorders, and energy (Wilson, 2015), (Wilson, 2014).

The results of anthropometric measurements showed that overweight and obesity are found in 50.4% of the surveyed population. Including obesity 2 and 3 degrees occurs in 4%, obesity of 1 degree - 13.6%, overweight - at 32.8% of the population. This male normal weight is recorded more frequently than women - 63.2% and 39.0%, respectively ($\chi 2$ = 12,2, p = 0,032). Gradations in body weight are presented in accordance with WHO recommendations based on the values of body mass index. The high degree of prevalence of overweight and obesity among the indigenous population was observed by us earlier (Klimov et al., 2012). Average anthropometric indices surveyed population, mainly dependent on gender (Table. 2). For women, characterized by a large fat mass, skin fold thickness at all points of measurement exceeds that of men. The average body mass index of women exceeds the normal value (25 kg/m^2), which indicates that this group of the population is more prone to obesity.

Table 2

The results of evaluation supply frequency method showed that individuals with underweight rarely use these types of meat like pork and young horse meat, beef and consume at least 2-3 times a week, while people with normal body weight consume it, usually on a daily basis. In the diet of people with overweight and obesity 1 degree (about 60-85%) dominated animal fats - cream, whipped cream and sour cream, which they use on average at least 1-3 times a week. This butter is included in the daily diet of the majority of the surveyed population (about 60-64%). It should also be noted that the majority of people with normal body weight (55-62%) on a daily basis to eat vegetables (cucumbers and tomatoes), while people with different degrees of obesity (87-90%) use them less often 1-3 times in Week. People who are overweight are also relatively more likely to use the berries: red and black currants, blueberries. It should be noted that, traditionally, the berries are eaten as a jam or in the form of fresh frozen with sugar, which increases the content of calories.

Results of the study indicate that the indigenous population is modern lifestyle with income to meet nutritional needs. These traditional economic activities associated with significant physical exertion, in most cases, are seasonal and do not last for an average of more than 2 weeks in a year. Sedentary lifestyle is typical for the majority of the respondents, as Daily work activity is not associated with significant physical exertion. It should be noted that part of the population that wants to contain farmstead livestock, largely feels the need for mechanization of fodder. For example, 61% of breeders indicate the need to purchase tractors and other agricultural machinery ($\chi 2$ = 69,5, p <0,001). The desire to alleviate the physical work in conjunction with the high cost of agricultural equipment and the costs of its contents, presumably to limit the public's ability to conduct a traditional way of life.

CONCLUSION

Thus, the daily diet of the population rather monotonous, the main place is occupied by bakery products, butter, meat and sweets. A small percentage of respondents in the daily diet include dairy products, vegetables, fruits, berries, eggs and fish. Even given the limitations of frequency method on nutrition study, resulting in an incomplete picture, it should be noted the imbalance in the diet of the rural population. Physical activity in daily life

is characterized as insufficient. Evidence of an imbalance between energy consumption and energy costs is increased prevalence of overweight. At the time of the study in a population was marked associated with obesity metabolic disorders. To change the situation, along with the state policy in the field of healthy nutrition and to create conditions for physical training, the population must be motivated to improve the life quality.

REFERENCES

1. Anciferov M.B. Ozhirenie – epidemiya nashego stoletiya [Obesity as epidemy of our century / M.B. Antsiferov // Effektivnaya farmakoterapiya [Effective pharmacotherapy]. - 2007. - №1. - p. 38.
2. Gurova O.Yu. Metabolicheskie i psixicheskie osobennosti pacientov s ozhireniem: avtoref. dis. ... kand. med. nauk [Metabolic and mental features of obese patients: author. dis. ... PhD / O. Yu. Gurova. - M., 2010.
3. Dedov I.I. Ozhirenie [Obesity] / I.I. Dedov, G.A. Mel'nichenko. – M.: MIA, 2004. – 456 p.
4. Dedov I.I. Problema ozhireniya: ot sindroma k zabolevaniyu [Obesity: from syndrome to disease] / I.I. Dedov // Ozhirenie i metabolism [Obesity and Metabolism]. - 2006. - №1. - p. 2-4.
5. Klimova T.M., Fedorova V.I., Baltaxinova M.E. Kriterii ozhireniya dlya identifikacii metabolicheskix faktorov riska u korennogo sel'skogo naseleniya Yakutii [Criteria for identifying obesity metabolic risk factors in native rural population of Yakutia / T.M. Klimova, V.I. Fedorova, M.E. Baltakhinova // Siberian Journal of Medicine. / T.M. Klimova, V.I. Fyodorova, M.E. Baltaxinova // Sibirskij medicinskij zhurnal. – 2012. – №8. – S. 110-113.
6. Do physical activity and sedentary behavior relate to cardio-metabolic risk factor clustering in indigenous Siberian adults? / H.J. Wilson [et al.] // American Journal of Human Biology. – 2015. – Vol. 27. – P. 149-156.
7. Objectively measured physical activity and sedentary behavior of Yakut (Sakha) adults / H.J. Wilson [et al.] // Annals of human biology. – 2014. – Vol. 41. – №2. – P. 178-184.
8. WHO. Obesity: preventing and managing the global epidemic. Report on a WHO Consultation. Technical Report Series, №894 / WHO. – Geneva, 2000. – 265 p.

Table 1

Sources of food

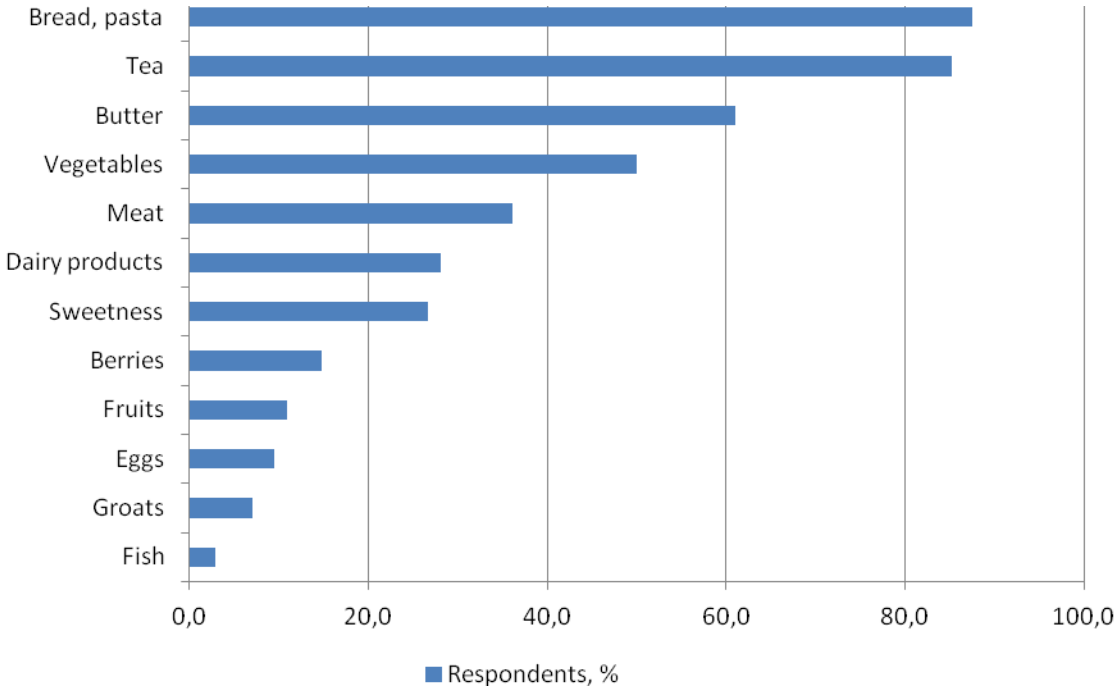
Food items	Store, %	Domestic, %	Exchange, %	Families, %	In total, %
Meat and fish	61,7	26,8	0,2	11,3	100
Dairy products	87,6	10,8	0,2	1,4	100
Fats	91,4	7,5	0,0	1,1	100
bakery products	99,5	0,2	0,0	0,3	100
Groats	100,0	0,0	0,0	0,0	100
Vegetables	51,9	46,4	0,0	1,7	100
Fruits	100,0	0,0	0,0	0,0	100
Berries	16,3	81,1	0,0	2,6	100
Beverages (tea, juices, mineral water)	97,7	2,3	0,0	0,0	100
Sweetness	99,7	0,3	0,0	0,0	100

Table 2

Anthropometric characteristics of the adult population the Berdigestjah village

Anthropometric indices	Women			Men		
	n	M	δ	n	M	δ
Height, cm	150	154,4	5,8	59	164,8	7,1
Body mass, kg	150	62,4	12,1	59	65,4	9,6
Arm circumference, cm	150	30,2	4,2	59	29,7	3,4
Waist circumference, cm	150	94,4	13,2	59	88,1	9,3
Hip circumference, cm	150	97,1	7,4	59	94,9	7,6
Triceps skinfold, mm	150	34,0	9,7	59	17,3	10,0
Biceps skinfold, mm	150	22,8	11,0	59	8,1	4,9
Subscapular skinfold, mm	150	26,5	9,7	59	18,9	8,6
Suprailiac skinfold, mm	150	45,7	12,7	59	32,5	16,4
Sum of skinfold, mm	150	129,0	38,4	59	77,2	34,3
Fat mass, kg	150	21,7	9,3	59	14,7	6,3
Fat mass, %	150	33,5	9,4	59	21,3	6,7
Fat free mass, kg	150	40,9	4,0	59	51,4	5,6
Muscle mass, kg	150	38,8	3,8	59	48,8	5,4
Water mass, kg	150	28,3	3,2	59	36,3	4,0
Water mass, %	150	46,0	5,8	59	55,4	5,1
Bone mass, kg	150	2,1	,2	59	2,6	,3
Body mass index	150	26,3	4,9	59	24,3	3,4

M – average, δ – standard deviation, n – the number of observations



Authors:

Fedorov Afanasy Ivanovich, Ph.D., Senior Researcher of Research Institute of Health North-Eastern Federal University named after MK Ammosov.

Contact: Sergelyakhskoe Highway 4 km, Building C2, Yakutsk, 677010, Russia, tel .: 8 (4112) 35-32-75, 89142332966, e-mail: ai.fedorov@s-vfu.ru**.**

Klimova Tatiana Mikhailovna, PhD., Chief Researcher of Research Institute of Health North-Eastern Federal University named after MK Ammosov.

Contact: Sergelyakhskoe Highway 4 km, Building C2, Yakutsk, 677010, Russia, tel .: 8 (4112) 35-32-75, e-mail: biomedykt@mail.ru.

Fedorova Valentina Ivanovna, Ph.D., Senior Researcher of Research Institute of Health North-Eastern Federal University named after MK Ammosov.

Contact: Sergelyakhskoe Highway 4 km, Building C2, Yakutsk, 677010, Russia, tel .: 8 (4112) 35-32-75, vifedorova@rambler.ru.

Baltakhinova Marina Yegorovna, Researcher of Research Institute of Health of the North-Eastern Federal University named after MK Ammosov.

Contact: Sergelyakhskoe Highway 4 km, Building C2, Yakutsk, 677010, Russia, tel .: 8 (4112) 35-32-75, e-mail: bmeg@rambler.ru.