Characteristic of body mass index of female population of the Sakha Republic during the various periods of ontogenetic cycle

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Summary. Results of overall dimensions, body mass index of 1638 women of the Sakha Republic (Yakut, Caucasoid, been born and constantly living in Yakutia) are presented. Ethno-age features of dimensional indicators, body mass index, frequency of deviations of BMI from normal indicators (the insufficient mass of body, surplus of weight of body, obesity) in various ethnic and age groups of women of the Sakha Republic are revealed. The revealed age distinctions have the same character in both ethnic groups.

Keywords: anthropometry, body mass index, woman of the Sakha Republic.

Introduction

Questions of obesity, insufficiency of weight of a body, maintenance of normal indicators of weight of a body draw to themselves attention of experts of various areas of health care and physical culture. Influence of the listed deviations of weight of a body on a state of health, duration and quality of life, risk of emergence and the course of diseases is indisputable to that numerous literary data [1, 5, 7] testify. In this regard research of anthropometrical indicators of the population is actual. Thus at an assessment of anthropometrical indicators it is necessary to consider age, sexual, ethno-territorial features [6, 10]. The Sakha Republic is the region with severe climatic conditions of accommodation which in aggregate with modern social and economic conditions, nature of a food, level of physical activity have direct impact on development of a human body [8]. In this regard the purpose of our research were an assessment of dimensional indicators (length and the weight of a body), body mass index (Ketle-2 index) of women aged from 21 till 90 years of the Sakha Republic, identification of deviations from norm during the various periods of an ontogenetic cycle of adult women.

Materials and methods

We carried out the analysis of anthropometrical indicators of 1638 women of the Sakha Republic (1227 women of the Yakut nationality and 411 Caucasian women). According to an age periodization ontogenesis of the person, accepted at the VII All-Union conference on problems of age morphology, physiology and biochemistry of the Academy of Sciences of the USSR (1965), the surveyed women treated four age groups: To the I period of mature age (21-35 years), II period of mature age (36-55 years), elderly (56-74) and senile to the age periods (75-90 years). All women were born and constantly lived in the territory of Yakutia. On the social status the surveyed women are students of internal and correspondence forms of education of various faculties of the highest and average special educational institutions of Yakutsk, workers, employees, pensioners of various

districts of the Sakha Republic. Anthropometrical measurements were carried out by V.V.Bunak's (1931) [2] admitted to scientific research institute of Anthropology of the Moscow State University (1981) according to requirements to carrying out anthropometrical researches the technique. The index assessment was carried out on the Ketle-2 index (to body mass index, BMI). According to WHO (World Health Organization) recommendations (1989), BMI is less than 18,5 assumes existence at surveyed the chronic power insufficiency (CPI), BMI is more than 25 testifies to existence of excess weight, BMI is more than 30 points to obesity existence.

The received material was processed by a method of variation statistics. Nature of distribution of each sign on the subsequent calculation of size M and its error of m, an average square deviation δ, coefficient of a variation of a sign of V became formed. For an assessment of a normality of distribution of data Kolmogorov-Smirnova criterion was used. In work methods of parametrical and nonparametric statistics were used. The assessment of group distinctions was carried out by t-criterion to Stewdent and to Mann-Whitney's U-criterion [3]. Reliable considered distinction 2.5 between compared ranks with level of reliable probability of 95% ($p < 0,05$).

Results and discussion

The analysis of dimensional indicators of the surveyed women revealed that in group of women of the Yakut nationality average values of length of a body of women of the surveyed age groups authentically ($p<0,001$) differ (tab. 1). So, the greatest length of a body (159,3±0,3 cm) was registered in group of women of the I period of mature age, and the smallest (149,1±0,3 cm) – at women of senile age. In group of Caucasian women length of a body of women of I and II periods of mature age authentically didn't differ, but was authentically above similar indicators of women of the senior age groups. Distinctions in indicators of length of a body of the population of various age groups, changes of the average sizes of a body of individuals from generation to generation are explained by the phenomena of a secular trend and come to light in various regions of the world [4]. In our research secular manifestations of length of a body are revealed in both ethnic groups.

It is known that age variability of weight of a body of women is connected with hormonal transformations, reduction with age level of physical activity, delay of metabolic processes. Existence of ethno-territorial rates of age changes of weight of a body causes scientific interest. The analysis of weight of a body of women of the Sakha Republic revealed the following nature of age variability. Indicators of weight of a body authentically increase from the first period of mature age by the II period of mature age; authentically decrease from elderly to senile irrespective of an ethnic origin. The researches conducted in Krasnoyarsk territory, revealed similar age changes of length and weight of a body with the maximum indicator of weight of a body at advanced age [9]. In our research of reliable distinctions between average values of weight of a body of women of the II

period mature and elderly age groups in both ethnic groups it isn't revealed.

The analysis of indicators of BMI revealed that normal value of body BMI (18,5-25) was revealed at 765 women that made 46,7% of the surveyed women. BMI less than 18,5 (CPI existence) was defined at 81 women that made 4,9% of the surveyed women. Surplus of weight – at 521 (31,8%), obesity – at 271 (16,6%) women. The analysis of indicators of BMI depending on age revealed that average values of BMI authentically increase from the I period of mature age to elderly and decrease at senile age in both ethnic groups.

Assessment of frequency of registration of normal weight of a body and deviations from it at women of various ethnic groups I revealed the following features. Among women of Yakut (n=1227) normal value of BMI is revealed at 50,4% of women (fig. 1), among women of the Russian nationality - at smaller percent (35,5%) women (fig. 2). In both ethnic groups of CPI it was noted in a small amount (5,7% of Yakut women and 2,7% - Caucasian women). Obesity is revealed at 13% of Yakut and 27,3% of Caucasian women. Thus, extreme deviations from norm of weight of a body in the form of CPI were noted more often at Yakut, in the form of obesity – at Caucasian women.

Research of the age characteristic of BMI in the surveyed ethnic groups revealed intergroup distinctions of a share of persons with BMI. So, in both ethnic groups the share of persons with CPI is more in group of women of the I period of mature age, decreases in the senior age groups with increase at senile age. The share of persons with obesity increases from the I period of mature age to elderly and decreases to the senile. It is established that extreme options (CPI, obesity) met in smaller percent of cases, than norm and surplus of weight of a body in all surveyed ethno-age groups.

At the comparing frequency of deviations of BMI among women of the Sakha Republic Caucasoid group and women of Krasnoyarsk territory the same nature of variability of BMI is revealed. However pays attention the fact of bigger percent of elderly Caucasian women (been born and constantly living in the Sakha Republic)) with normal BMI (38,8%), than in Krasnoyarsk territory (8,7%) [9].

Conclusions

Thus, we revealed age features of dimensional indicators and an body mass index of women of the Sakha Republic of two ethnic groups (the Yakut, Caucasoid), been born and constantly living in Yakutia. Age features of length and the masses of a body which are characterizing authentically by higher average values of length of a body of young women in comparison with similar indicators of women of the senior age groups are revealed. Indicators of weight of a body authentically increase from the I period of mature age by the II period of mature age, authentically decrease from

advanced age to senile irrespective of an ethnic origin. The increase in average values of BMI from the I period of mature age to elderly and reduction to senile age is defined. Average values of body built index, frequency of deviations of BMI from normal indicators in various ethnic groups are established. Research of the age characteristic of body built index revealed intergroup distinctions of a share of persons with body built index deviations (CPI, surplus of weight of a body, obesity) in various stages of an ontogenetic cycle of women. The revealed age distinctions have the same character in both ethnic groups. It is established that extreme deviations of body built index from norm (CPI, obesity) met in smaller percent of cases, than norm and surplus of weight of a body in all ethno-age groups. Thus deviations from norm of weight of a body in the form of CPI were noted more often at Yakut, in the form of obesity – at Caucasoid in all age groups.

The provided data testify to existence of ethno-age variability of overall dimensions, BMI which needs to be considered at an assessment of the physical status of the population experts of various areas of medicine, health care, physical culture and sport.

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Table 1

Anthropometrical indicators of women of the Sakha Republic of various ethno-age groups

	Yakut				Caucasian			
Age period	Mature I (n=288)	Mature II (n=475)	Elderly (n=284)	Senile (n=180)	Mature I (n=54)	Mature II (n=226)	Elderly (n=98)	Senile(n =33)
Length of a body, cm	159,3±0 ,3	157,8±0 ,2	153,8±0 ,3	149,1±0 ,3	159,6±0 ,6	161,1±0 ,5	157,2±0 ,7	156,4±1 ,0
Mass of a body, kg	59,0±0, 6	63,0±0, 5	62,2±0, 6	54,2±0, 9	65,3±1, 6	71,7±0, 9	70,4±1, 6	63,9±2, 5
BMI	23,2±0, 2	25,2±0, 1	26,2±0, 2	24,2±0, 3	25,6±0, 6	27,7±0, 3	28,5±0, 7	26,2±1, 1

Fig. 1

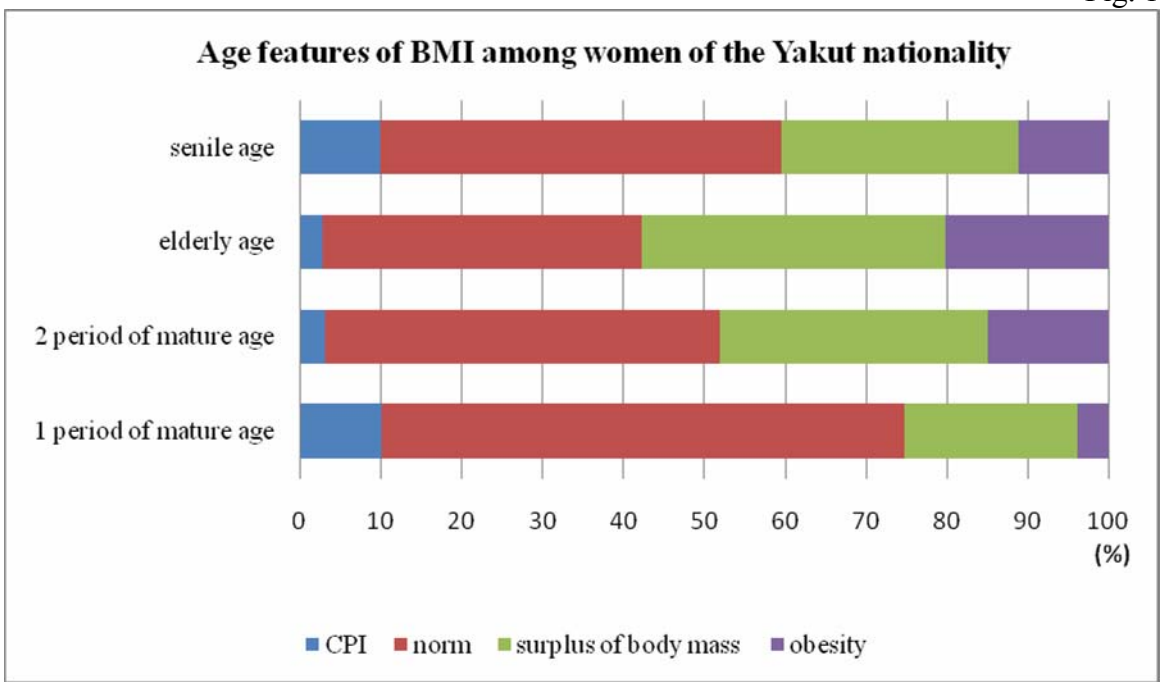
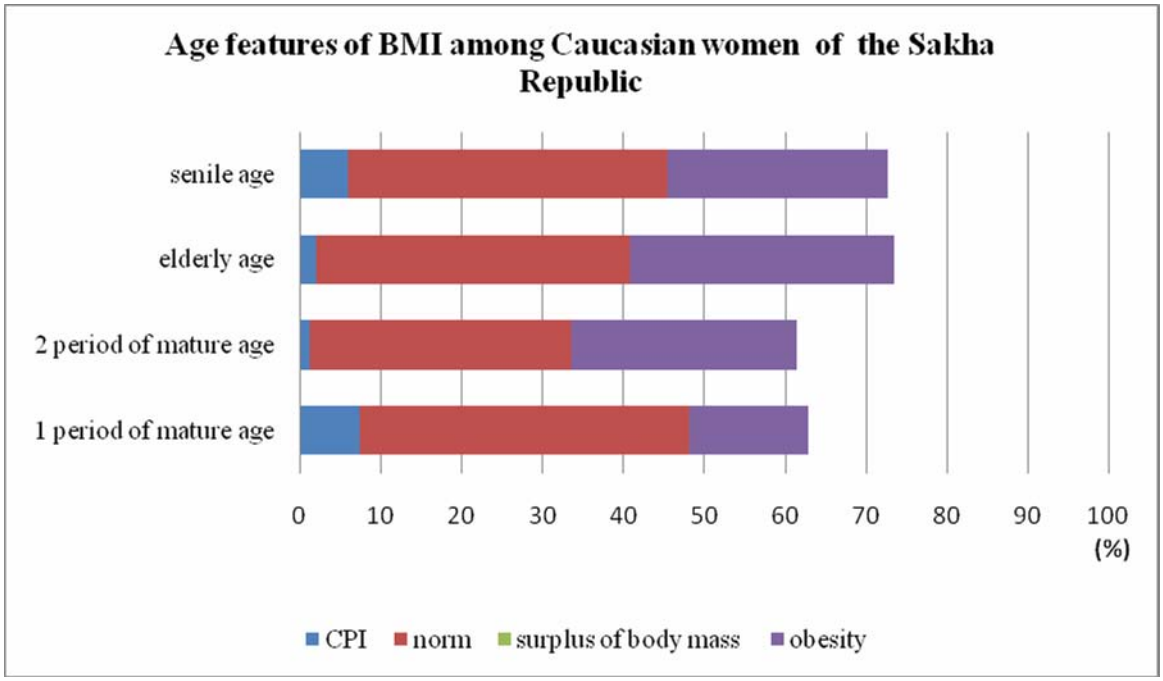


Fig. 2


Age features of BMI among Caucasian women of the Sakha Republic
senile age
elderly age
2 period of mature age
1 period of mature age
0
10
20
30
40
50
60
70
80
90
100
(%)
CPI
norm
surplus of body mass
obesity