INTRODUCTION

A series of surveys were conducted in the Republic of Sakha (Yakutia) over the past 30 years, including the study and monitoring of the epidemiological situation with regard to cardiovascular diseases in the indigenous population of the region, but they covered children and working-age adults [1–3, 7–9]. Research on the characteristics of BP in the indigenous elderly population of different ethnic groups in the region concerned only the age groups of 60–64 and 90 years of age and older [5, 6]. At the same time, no large-scale epidemiological surveys were conducted in the Yakut population studying BP in older age groups. In this connection, it appears of interest to investigate the peculiarities of BP in elderly members of different ethnic groups living in Yakutia using the case study of Yakutsk residents.

The purpose of this survey is to investigate the BP peculiarities in persons belonging to age groups of sixty and older, representing different ethnicities and living in Yakutia (for the case study of urban population) and their relationship with other risk factors of cardiovascular diseases.

MATERIALS AND METHODS

In order to conduct a population survey, a representative sample of people aged 60 years and older was drawn on the basis of the electoral rolls of Yakutsk by a computer-based random number generator. Persons from the drawn sample were invited to a check-up by special invitation letters sent up to five times. If there was no response to the letter of invitation people selected for the survey were visited at home. The study was approved by the Ethics Committee of the Yakutsk Research Center of Complex Medical Problems, Siberian Branch, Russian Academy of Medical Sciences. All the survey participants gave their informed consent to take part in the research program.

In total, we surveyed 775 people (the response rate was 79.9%). The database for the analysis of BP includes information about 746 people. The survey subjects were divided into three ethnic groups, i.e., 344 Yakuts (46.1% of patients, mean age 76.9 ± 9.4 years), 382 Caucasoids (Russian, Ukrainians, Belarusians, Poles, Germans, and Jews) (51.2%, mean age 74.6 ± 9.1 years) 17 other (Tatars, Buryats, Koreans, etc.) (2.3%). Three people did not specify their nationality. Features of blood pressure were stud-
Criteria for the Evaluation of Results

In conducting the population study, we used standard methods and standardized evaluation criteria in accordance with the National Clinical Guidelines developed by the Russian Scientific Society of Cardiology [4].

BP measurements were performed using a mercury sphygmomanometer with an accuracy of 2 mm Hg on the patient’s right hand (the hand was on the table) with the patient in a comfortable sitting position in a chair after a five-minute rest. BP was measured three times at intervals of not less than 1 minute and the mean value was taken into account.

To calculate the anthropometric data, we used a traditional indicator—the Quetelet index-II, which was calculated by the formula $QI \left(\frac{\text{kg}}{\text{m}^2}\right) = \frac{\text{weight (kg)}}{\text{height (m)}^2}$. Overweight was recorded with $QI \geq 25$ and $<30 \text{kg/m}^2$; obesity was recorded with $QI \geq 30 \text{kg/m}^2$. The main symptom of the central (abdominal) obesity was taken to be a waist circumference exceeding $120 \text{cm}$ for men and exceeding $88 \text{cm}$ for women.

Hypercholesterolemia (HCH) was taken to be the values of the total cholesterol (TC) $\geq 5.0 \text{ mmol/L}$; the reduced level of the TC HDL was assumed to be its values $\leq 1.0 \text{ mmol/L}$ for males and $\leq 1.2 \text{ mmol/L}$ for females. Hypertriglyceridemia (HTG) was understood as the TG level exceeding $\geq 1.7 \text{ mmol/L}$. Hyperglycemia was determined as the level of glucose in the blood plasma in fasting adults exceeding $>5.6 \text{ mmol/L}$. Individuals that have never smoked or quit smoking in the past 12 months were considered nonsmokers, and those who smoked at least one cigarette per day were assumed to be smokers. The surveyed subjects were considered hereditarily tainted with hypertension if the latter and/or stroke or resulting death had been reported in the past medical history of first-degree relatives by one of the parents of the surveyed or his/her brothers, sisters or children.

The comparison of age-adjusted BP values was performed depending on the marital status (living alone—elderly people living without immediate or distant relatives, single or unmarried, divorced or widowed persons; and those who lived with immediate or distant relatives, married, or living in cohabitation) and on education (with no education or primary education and secondary and higher education).

The statistical analysis of the results was performed using the statistical software package SPSS for Windows (11.5 version). Comparison of two independent groups by variables with a normal distribution of values was carried out using modified Student’s t-test, and ANOVA was employed for three groups and more with a normal distribution. The comparison of the two independent groups of variables with abnormal distribution was performed using the Mann–Whitney test, and Dunn’s method was employed for groups of three or more abnormal distribution. On comparing the groups, age-adjusted indicators were used. The accepted standard was the mean age of the analyzed sample. The results were recognized as statistically significant at $p < 0.05$.

RESULTS AND DISCUSSION

The character of the distribution of the SBP and DBP values in Caucasoide population for the studied sample was close to normal (Kolmogorov–Smirnov test, $p > 0.05$). In the subsample of Yakuts, the distribution of SBP and DBP levels was different from normal (Kolmogorov–Smirnov test, $p < 0.05$). The distribution of pulse pressure (PP) values was abnormal in character for the subsamples of Yakuts and Caucasoide. In all age decades, the distribution of the SBP, DBP, and PP variables by sex and ethnicity was of a normal character.

The mean value of SBP in Yakuts aged 60 and older ($n = 344$ persons) was $146.2 \pm 23.0 \text{ mm Hg}$. The median (Me) was $143.3 \text{ mm Hg}$ ($25\% = 130.0 \text{ mm Hg}; 75\% = 161.3 \text{ mm Hg}$). In the Caucasian population, the mean SBP value was $150.4 \pm 25.5 \text{ mm Hg}$, Me $= 146.7 \text{ mm Hg}$ ($25\% = 133.3 \text{ mm Hg}; 75\% = 166.7 \text{ mm Hg}$). In the Caucasian sample, the obtained mean SBP value is more statistically significant than that for the Yakut subsample ($p = 0.02$). In age-adjusted SBP values, the difference between Yakuts (146.3 ± 24.4 mm Hg) and Caucasoide (150.2 ± 24.4 mm Hg) remained statistically significant ($p = 0.03$).

The analysis of mean SBP values in persons with different ethnicity by age groups (Table 1) showed that the SBP values exceeded the normative values in all age groups both for Yakuts and the Caucasian population, with the exception of Yakutian long-livers. The dynamics of mean SBP values in the age groups of 60–69 and 90 years old and above showed their reduction in Yakuts by $8.8 \text{ mm Hg}$ ($p = 0.047$) and the in Caucasian population by $10.1 \text{ mm Hg}$ ($p = 0.05$). Furthermore, in the age decades of 60–69, 70–79, and 80–89 years, they were practically at the same level. In male Yakuts, SBP reduction in the groups aged 60–69 and 90 years and older was less pronounced (9.7 mm Hg) than in male Caucasoids (by 15 mm Hg). The differences in the rate of SBP reduction in Yakut and Caucasian females are less pronounced (9.6 and 10.2 mm Hg, respectively).

The mean DBP value in Yakuts of the surveyed sample was $85.5 \pm 11.1 \text{ mm Hg}$, and the median (Me) was $84.3.0 \text{ mm Hg}$ ($25\% = 80.0 \text{ mm Hg}; 75\% = 91.6 \text{ mm Hg}$). In the Caucasian population, the mean DBP value was $89.0 \pm 13.1 \text{ mm Hg}$, Me $= 90.0 \text{ mm Hg}$ ($25\% = 80.0 \text{ mm Hg}; 75\% = 98.0 \text{ mm Hg}$). The mean DBP values in Yakuts proved to be statistically significantly lower than in Caucasoids ($p < 0.0001$).