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Relationship of Psycho-Emotional State and Bad Habits with an Expression of Dyslipidemia in the Yakutia Working Population

ABSTRACT

Medico-social, psychodiagnostic and biochemical studies of the working population of Yakutia were carried out. The survey covered both rural (indigenous population) and urban residents (non-indigenous population). Analysis of lipid metabolism disorders in the population of Yakutia

revealed that one of the reasons expressed by deviations from the normal values of lipid metabolism in the indigenous population is smoking and alcohol consumption, possibly due to the low standard of living.

Keywords: low standard of living, personal anxiety, depression, alcohol, smoking, dyslipidemia.

INTRODUCTION

Under modern conditions high incidence rate of the population of Yakutia not only depends on a range of adverse factors relating to climatic conditions of living, but it is possibly subjected to socio-economic changes for the last years as well [1]. The medical and social research conducted in Yakutia has shown that high levels of trait anxiety residents, first of all are associated with low levels of life [4,5,6].

In the meantime a state of prolonged emotional tension is one of the reasons for failure of adaptive reactions of an organism [3,11], and one of the degradation factors of reserve capacity of the organism adaptation is lipid metabolic imbalance [12,13]. Also aggravating factors in the development of atherosclerotic vascular changes are bad habits like smoking and drinking alcohol.

Accordingly, the study of relationship of addictions and anxiety-depressive disorders with lipid metabolism of blood serum at new arrivers and indigenous population of Yakutia is of great significance.

The aim of this study was to identify association between serum lipid metabolism with quality of life, anxiety-depressive disorders and addictions (alcohol, smoking) in the working population of Yakutia.

MATERIALS AND METHODS

In field conditions we conducted medico-social, psycho diagnostic and biochemical studies of the population of working age (16 to 60 years) living in rural and urban areas of the Republic of Sakha (Yakutia). The study included 214 people living in rural areas, and 228 employees of an industrial sector, living in urban areas. The ethnic composition of the population surveyed were as follows: 100% of the indigenous population among villagers, 97% new arrivers among urban population.

The social and hygienic method of analysis (a survey questionnaire) studied conditions and a way of life of the workforce. The questionnaire, developed by the ILCYSCB RAMS, included 32 questions. Psycho-emotional state of the population has been studied using standardized methods: Beck Depression Inventory questionnaire, the scale of self-esteem level of personal anxiety BHSpielberger-JL Hanina.

Laboratory studies were carried out under conditions of constant internal and external quality control (FSEQC). Determination of the levels of total cholesterol (TC), HDL cholesterol (HDL cholesterol), triglycerides

(TG) were performed by enzymatic method for the automatic biochemical analyzer «Cobas Mira Plus» company «La Roche» (Switzerland) using reagents «Biocon» (Germany). LDL (low density lipoprotein cholesterol) and VLDL (cholesterol VLDL) was calculated by the formula Friedewald et al. [15]. Atherogenic factor calculated by the formula proposed by AN Klimov [8]: $Ka = (\text{cholesterol} - \text{HDL cholesterol}) / \text{HDL-C}$.

For hypercholesterolemia accepted level of total cholesterol $\geq 5,0 \text{ mmol} / \text{l}$, increased LDL-C $\geq 3,0 \text{ mmol} / \text{l}$, decreased HDL cholesterol levels $\leq 1,0 \text{ mmol} / \text{l}$ in men and HDL cholesterol $\leq 1,2$ in women. Hypertriglyceridemia attributed TG $\geq 1,7 \text{ mmol} / \text{l}$.

Statistical data processing was performed using statistical software application package SPSS for Windows 17.0. Standard methods of variation statistics: Calculation of mean values, standard deviations, 95% confidence interval. Data in tables are presented as $M \pm m$, where M - average, m - SEM. The significance of differences between mean values was assessed using Student's t test and the Kolmogorov-Smirnov test. The probability of the null hypothesis is accepted at $p < 0,05$. Correlation analysis was performed by the method of Pearson and Spearman.

RESULTS AND DISCUSSION

Comparative analysis of lipid metabolism revealed that urban residents showed significant increase in triglycerides (TG), total cholesterol (TC), anti-atherogenic fraction of high density lipoprotein cholesterol (HDL-C) compared to the rural population with significant increase in the atherogenic lipoprotein fractions low density (LDL). As a result of violation of the ratio of atherogenic and anti-atherogenic cholesterol fractions among rural inhabitants atherogeneity coefficient exceeded admissible norms, and was significantly higher than their urban counterparts (Table. 1).

The frequency of dyslipidemia among indigenous people, adapted to the conditions at high latitudes, indicating exhaustion of functional reserves of the body in which the defense mechanisms and adaptive changes in the body can give a breakdown - disadaptive [3, 9, 10, 14].

In urban areas, 91% of the respondents live in comfortable homes, while in rural areas - only 2%. The remaining 68% of the villagers live in houses with no amenities (with oven heating), 30% - with partial conveniences (central heating). Questioning revealed that their living conditions in rural areas are not satisfied with more than half of respondents (53%), in the city - 9%. The causes of dissatisfaction with living conditions, according to respondents, are as follows: the lack of basic facilities, lack of living space and dilapidated housing.

58% of respondents feel the villagers have significant financial difficulties on their own assessment. At the same time 12% of respondents have shortage for food, 46% being with insufficient set of food, and only 4% of the population do not experience financial problems. The remaining 38% is enough money to purchase food and essential commodities. Among those working in the industry 44% live in abundance, the remaining 56% classified themselves as people of moderate means.

Analysis of psycho-diagnostic studies showed that the level of personal anxiety (RT) among the surveyed persons of working age was 96.5% (moderate - 67.8%, high - 28.7%). Indicators of anxiety on average in graduation "low anxiety" were as follows: for men - 3.4% among women - 3.5%; "Moderate anxiety", respectively 69.2% and 65.7% in terms of "high anxiety", respectively, 27.4% and 29.1%. It should be noted that high levels of trait anxiety was significantly more common among rural residents ($p < 0.05$). For example, one in three of every four villagers and townspeople have high RT. Depending on the age of the highest frequency of high radiotherapy was registered in the age of 30-39 years, moderate and low LT - in 20-29 years ($p < 0.01$). According to our data revealed that high levels of radiation therapy is typical for people whose income is only enough for food and essential items ($p < 0.01$).

Rates of depression among the rural population was 71.5% (moderate - 33.3%, high - 38.2%) among the urban population - 36.6% (moderate - 28.3%, high - 8.3%). Depending on the age of the highest frequency of the high degree of depression was noted in the age range of 20-29 and 50-59 years (28.6% and 28.4% of the total surveyed the appropriate age). On gender distribution, moderate and high levels of depression observed in 61.6% of women and 42.8% men.

The analysis of the relationship between the level of depression on the degree of improvement of housing and their subjective satisfaction showed that the worse living conditions and their score, the higher the level of depression. Thus, the presence of moderate to high degree of depression was observed in 72.6% of respondents living in houses with no amenities, 65% - with partial conveniences, 37% - with all the amenities. Among those surveyed dissatisfied with their housing conditions, 69% reported the presence of depressive symptoms.

As a result of the correlation analysis there was a significant relationship between the degree of depression and the following factors: low socio-hygienic standard of living ($p < 0.01$), financial situation ($p < 0.01$), sex ($p < 0.05$), the number of children ($p < 0.05$), the degree of improvement of housing and satisfaction with them ($p < 0.01$).

Depending on the study of lipid metabolism of anxiety and depression in persons surveyed had some peculiarities. For example, workers in the industrial sector, depending on the anxiety was a trend towards an increase in the levels of total cholesterol and atherogenic LDL fraction. A statistically significant decrease in HDL-C were found in the group of mild depression.

Statistically significant increase in blood lipid metabolism (triglycerides, LDL, VLDL and atherogenic factor, respectively) was found in the rural population with moderate anxiety. The high degree of anxiety combines a significant increase in the fraction of atherogenic LDL-C (Figure 1).

Dyslipidemia dependence on the degree of depression among villagers characterized statistically significant increase in triglycerides, LDL cholesterol and atherogenic factor in patients with high depression (Figure 2).

Correlation analysis revealed a significant correlation between depression and cholesterol levels ($p < 0.05$), LDL cholesterol ($p < 0.01$), atherogenic factor ($p < 0.05$) from the villagers.

Our results do not contradict the data in the literature that the economic transformations taking place in the country, had a negative impact on the psycho-emotional state of the entire population, which led to an increase in cardiovascular diseases, diseases associated with disturbed lipid metabolism [2, 11].

Thus, low socio-hygienic standard of living has a significant effect on the psycho-emotional state of the population and contributes to the disruption of lipid metabolism. Currently, due to the above factors, this problem is more acute for able-bodied people in rural areas of the Republic of Sakha (Yakutia).

According to the results of the questionnaire revealed that not consume alcohol in rural areas - 42%, urban - 15%; use on holidays in the countryside - 55% of the city - 71%; often used in the countryside - 3%, the city - 14%.

Statistically significant increase in the level of atherogenic lipid fractions depending on the consumption of alcohol was found in persons living in rural areas and regular drinkers (Table 2). Atherogenic factor they have exceeded the norm almost 2 times. In the group of urban dwellers significant abnormalities in lipid metabolism were found. It should be noted that people who regularly consume alcohol, there was a trend toward increased levels of HDL-C. It should be noted that research AN Klimov, NG Nikulcheva (1999) "alcoholic HDL" lose their functional properties, that is, do not participate in the reverse transport of free cholesterol [8].

Despite the fact that alcohol consumption in rural areas less frequently compared to urban areas is observed in the indigenous population expressed disturbances of lipid metabolism in individuals who consume alcohol. According to research Kershengolts BM et al. (2000), the indigenous population of Yakutia in 1.7-2.4 times lower resistance to alcohol compared with the Caucasoid, due to a decrease in the body's ability to oxidize ethanol without

formation of elevated concentrations of acetaldehyde due to phenotypic features isozyme spectra of alcohol dehydrogenases (ADH) and aldehyde dehydrogenase (AIDG) [7].

The most commonly smoked in rural areas-35% in urban areas-29%. Analysis of lipid profile among smokers and non-smokers surveyed persons according to the socio-hygienic living conditions revealed that dyslipidemia observed in smokers villagers. Thus, the atherogenic factor in smokers villagers exceeded the normal value by 1.7 times. In the group of smokers citizens dyslipidemia was less pronounced, which may be due to eating pattern alien population (frequent consumption of vegetables, fruits) (Table 3).

Correlation analysis revealed a significant association of lipid metabolism with smoking and alcohol consumption. Triglyceride levels depended on smoking ($p < 0,05$) and alcohol consumption ($p < 0,01$). Atherogenic lipid fraction VLDL dependent on alcohol and smoking ($p < 0,05$).

Thus, one of the reasons expressed by deviations from the normal values of lipid metabolism in the indigenous population is smoking and alcohol consumption, possibly due to the low standard of living.

CONCLUSION

The fight against alcoholism among the population and the prevalence of smoking, especially among working-age population, should be comprehensive. Create jobs in rural areas with a decent salary increase social standard of living, which will significantly improve the psycho-emotional state of the population of Yakutia.

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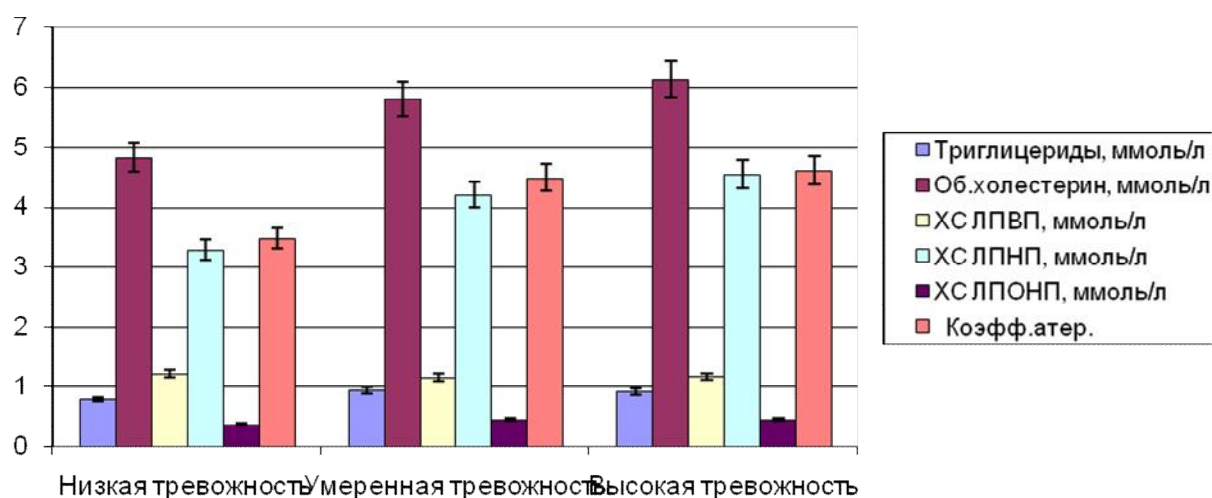


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Table 1

Lipid metabolism in the working age population (mmol / L)

Lipid metabolism	Village	Town	ρ
Triglycerides	0,94±0,05	1,08±0,05	< 0,01
Total cholesterol	5,89±0,11	6,27±0,12	< 0,01
HDL-Chol	1,15±0,04	1,65±0,04	< 0,01
LDL- Chol	4,25±0,12	4,08±0,09	< 0,05
VLDL - Chol	0,44±0,03	0,50±0,03	–
Atherogenic factor	4,49±0,21	2,84±0,10	< 0,01



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Figure 1. Dependence of the lipid metabolism on anxiety in rural population of Yakutia

Низкая тревожность - Low anxiety

Умеренная тревожность - Moderate anxiety

Высокая тревожность - High anxiety

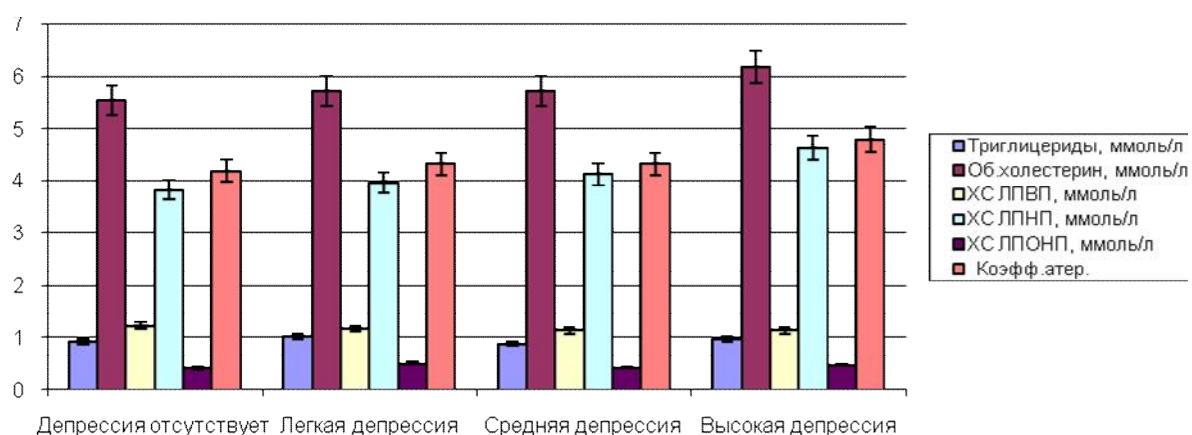


Figure 2. Dependence of the lipid metabolism on depression in rural population of Yakutia

Депрессия отсутствует - No depression

Легкая депрессия - Mild depression

Средняя депрессия - Average depression

Высокая депрессия - High depression

Table 2

Changes in lipid metabolism, depending on the alcohol (mmol/L)

Lipid metabolism	Village		Town	
	do not use	use regularly	do not use	use regularly
Triglycerides	0,84±0,05	1,17±0,16**	1,17±0,15	1,28±0,14
Total cholesterol	5,74±0,14	6,27±0,14**	5,99±0,28	6,56±0,30
HDL-Chol	1,14±0,04	1,17±0,08	1,52±0,09	1,59±0,09
LDL- Chol	4,11±0,15	4,57±0,16**	4,05±0,23	4,23±0,26
VLDL - Chol	0,40±0,03	0,53±0,08*	0,53±0,07	0,58±0,07
Atherogenic factor	4,31±0,23	4,93±0,45 (*)	2,73±0,25	3,09±0,29

Note: * - $p < 0,05$; ** - $p < 0,01$; (*) between drink- $p < 0,01$.

Table 3

Changes in lipid metabolism depending on smoking in the working age population
(mmol / L)

Lipid metabolism	Village		Town	
	non-smoking	smoking	non-smoking	smoking
Triglycerides	0,84±0,04	1,31±0,21** (*)	0,95±0,06	1,29±0,89**
Total cholesterol	5,93±0,13	5,80±0,23	6,09±0,15	6,44±0,17
HDL-Chol	1,18±0,04	0,99±0,07**	1,74±0,05	1,62±0,07
LDL- Chol	4,26±0,13	4,20±0,23	3,96±0,13	4,14±0,14
VLDL - Chol	0,39±0,02	0,59±0,09*	0,43±0,03	0,62±0,05**
Atherogenic factor	4,28±0,23	5,24±0,46 (*)	2,63±0,13	3,05±0,18

Note: * - $p < 0,05$; ** - $p < 0,01$; (*) between smokers- $p < 0,01$.

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