TOMSKY Mikhail Innokentievich - D. Med. Sc, Director of YSC CMP;
GOLDEROVA Aitalina Semenovna - D. Med. Sc, chief researcher of YSC CMP; ROMANOVA Anna Nikolaevna. - D. Med. Sc,, chief researcher of YSC CMP;
NIKOLAEV Vyacheslav Mikhailovich - Cand of Biol. Sc, senior researcher of YSC CMP;
KIPRIYANOVA Nadezhda Sidorovna - D. Med. Sc, Professor Medical University of NEFU:
NIKOLAEVA Tatiana Ivanovna – Cand. Med. Sc., deputy chief doctor of Yakut Republican Oncology Center (YROC),
ZHARNIKOVA Tatyana Nikolaevna - Cand of Med. Sc., head of the surgical department of YROC,
MAKAROVA Natalia Nikolaevna - Cand of Med. Sc., head of the gynecology department YROC,
MYREEVA Svetlana Anatolievna - Cand of Med. Sc, surgeon-oncologist of YROC.

ORIGINAL RESEARCHES

E.P. Borisova, E.S. Kylbanova

VALUE OF ENVIRONMENTAL FACTORS IN THE YAKUTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND CHRONIC BRONCHITIS IN COMBINATION WITH METABOLIC SYNDROME

ABSTRACT

Objective. To assess the influence of environmental factors in the Yakuts with the combination of chronic obstructive pulmonary disease and chronic bronchitis with metabolic syndrome.

Materials and methods. A comprehensive examination of 148 patients was performed on the basis of the emergency department of the Republican Hospital No. 2 - the Center for Emergency Medical Care in Yakutsk. The main group consisted of 88 patients with metabolic syndrome in combination with chronic obstructive pulmonary disease (COPD) and chronic bronchitis (CB) of Yakutia. The average age was 50.9 ± 0.91 years, for gender: women 69.3%, men 30.7%. The comparison group consisted of 60 patients of Yakut nationality with COPD and chronic bronchitis without metabolic syndrome. The average age of 48.9 ± 1.35 years was consistent with the age of the main group, the gender composition of women was 80%, men 20%. Patient survey was carried out taking into account the developed questionnaire, approved by the ethical committee, which contained questions on the blocks: socio-demographic characteristics, anamnestic data, heredity research, behavior and health.

Results. In the course of the study, it was revealed that for such environmental risk factors as physical activity, smoking, alcohol consumption, the frequency of occurrence in the groups does not differ. At the same time, a higher index of a smoker and fewer hours spent on physical activity a week are more common in Yakuts with chronic obstructive pulmonary disease and chronic bronchitis with a metabolic syndrome, which negatively affects the risk of cardiovascular complications in this category of patients.

Conclusion. Thus, we have identified a significant contribution of environmental factors, in particular low physical activity, to the development of MS and a negative characteristic for a greater number of pack-years in individuals with CK / COPD in combination with MS.

Keywords: metabolic syndrome, chronic obstructive pulmonary disease, chronic bronchitis, environmental factors.

Diseases of the respiratory system in the Republic Sakha (Yakutia) occupy one of the leading places in the structure of morbidity and determine to a large extent the level of temporary disability, disability and mortality of the population.

According to WHO, chronic obstructive pulmonary disease (COPD) is one of the most common diseases, it is expected to become the third leading cause of death in 2020. Over the past decade, the concept of COPD has been recognized as a disease with systemic manifestations including cardiovascular pathology, cachexia, muscle dysfunction, osteoporosis, anemia, clinical depression, metabolic disturbances and endothelial dysfunction [7].

Currently, the metabolic syndrome (MS) is seen as a «21st century pandemic» by the WHO experts. Its prevalence among the adult population of Russia according to the data of the VNOK, 2009, is 20-40% and more often it occurs in middle-aged and older people. The prevalence of MS according to the criteria of the International Diabetes Federation among the aboriginal population of Yakutia is 8.8% [5].

However, currently the peculiarities of the combined course of the pathology of the respiratory tract with MS in the domestic science are devoted to single studies and there is no data on this combined pathology in the Yakut ethnic group.

The aim of the study was to assess the influence of environmental factors in the Yakuts with the combination of chronic obstructive pulmonary disease and chronic bronchitis with metabolic syndrome.

MATERIALS AND METHODS OF RESEARCH

A comprehensive examination of 148 patients was performed on the basis of the emergency department of the Republican Hospital No. 2 - Center for Emergency Medical Care in Yakutsk. All patients signed informed consent to participate in the survey. The research was carried out within the framework of the research project «Metabolic syndrome and chronic non-infectious diseases among the inhabitants of Yakutia». The approval of the local ethical committee of the Yakutsk Scientific Center of Complex Medical Problems of the Siberian Branch of the Russian Academy of Medical Sciences was obtained.

The main group consisted of 88 patients with metabolic syndrome in combination with chronic obstructive pulmonary disease (COPD) and chronic bronchitis (CB) of Yakutia. The average age was 50.9 ± 0.91 years, for gender:

women 69.3%, men 30.7%. The study included: patients with a diagnosis of COPD 44.3%, with a diagnosis of chronic bronchitis 55.7%.

The comparison group consisted of 60 patients of Yakut nationality with COPD and chronic bronchitis without metabolic syndrome. The average age of 48.9 ± 1.35 years was consistent with the age of the main group, the gender composition of women was 80%, men 20%, patients diagnosed with COPD 41.7%, diagnosed with chronic bronchitis 58.3%. During the statistical analysis, it was established that the study groups did not differ significantly in age, sex composition, and the correlation of diagnoses of COPD and CB.

The diagnosis of COPD and chronic bronchitis was established on the basis of complaints, a history of the disease, an objective examination, spirometry data, in accordance with international conciliation documents: The Global Strategy for the Diagnosis, Treatment and Prevention of Chronic Obstructive Pulmonary Disease 2011 revision (Global Initiative For Chronic Obstructive Lung Disease), the definition of experts from the World Health Organization, the international classification of diseases X revision. Metabolic syndrome was established on the basis of the recommendations of the All-Russian Scientific Society of Cardiology of 2009.

The patients were questioned according to the developed questionnaire, approved by the ethical committee. The status of married (married) included married (married) or living with a partner outside of marriage; In the «lonely» group included single (unmarried), widowers, widows, divorced or living separately. By the level of education, groups with average general, secondary vocational and higher education were selected, by type of employment: mental work, manual labor, pensioners and unemployed.

When studying the history of smoking, the index of the smoking person (ICC) was used in units of «pack / years», which was calculated by the formula: total number of packs / years = number of cigarettes smoked per day × number of years / 20. Index of smoking person> 10 packs / years - a reliable risk factor for COPD.

The assessment of the level of activity was conducted by questioning and is based on one's own assessment of the level of activity by patients, taking into account the number of hours spent on household physical activity per week, physical education and sports.

Statistical processing and analysis of data was carried out using the statistical software package SPSS for Windows. The quantitative indices in the study groups were described by mean values (M) and standard error (m). The verification of the laws of distribution of quantitative indicators was carried out using the Kolmogorov-Smirnov test. The results of the audit showed that the distribution of many quantitative indicators does not obey the normal law. Therefore, for a comparative analysis of quantitative indicators, a nonparametric Mann-Whitney test was used. Investigation of the interrelations of qualitative features was carried out using the classical criterion of Chi-square Pearson. The threshold value of all statistical criteria used was p <0.05.

RESULTS AND DISCUSSION

Due to the fact that social factors undoubtedly influence the incidence of chronic non-infectious diseases, we analyzed groups of patients depending on the marital status, educational level and nature of work.

The data of the comparative social characteristics are presented in Table 1. According to the social status of the main group (COPD / HB + MS, Yakuts), married people prevailed - 77.3%, with secondary vocational education - 48.9%, pensioners - 34.1%. In the comparison group, the share of married people was 66.7%, the level of education was dominated by patients with secondary general education - 35.0%, by employment - mental workers - 38.3%. In analyzing the social status, no statistically significant differences between the groups were found.

In the development of COPD / CB and MS components, heredity is of particular importance. From the unmodified risk factors, the presence of weighed heredity for the development of hypertension, coronary artery disease, cerebral circulatory disorders, diabetes mellitus, oncological pathology, bronchial and pulmonary diseases was assessed. Both in the main and in the comparison group, the aggravated heredity for development of hypertension (56.3% and 51.7%), bronchial and pulmonary diseases (36.4% and 28.3%) was detected quite often (Table 2), however Significant differences in the ratio of AH, IHD, cerebral circulation disorders, diabetes mellitus, oncological pathology, bronchial and pulmonary diseases among the groups studied, we were not identified.

It is known that patients with COPD had a sedentary lifestyle, which contributes to the development of obesity: a study conducted by F. Pitta et al. (2005) showed that patients with COPD go on average 44 minutes a day, while healthy ones 81 minutes a day (p <0.001) [6]. A number of studies have shown that patients with COPD have one or more components of the metabolic syndrome, and a coexisting metabolic syndrome is associated with systemic inflammatory response and lack of physical activity [1, 8]. It is known that the lack of physical activity is one of the most important factors determining the accumulation of visceral fat, which is observed in patients with COPD and MS [3, 4].

In the group with the combined course of COPD / CB and MS, the share of people engaged in physical training was 6.8%, which did not differ from that in the COPD / CB group without MS (13.4%). While the number of hours spent on physical activity per week in the main group was significantly lower than in the comparison group without MS: 23.7 ± 1.98 hours compared to 27.9 ± 2.34 hours, p = 0.000, respectively (Table 3).

The reason for the frequent association of COPD and cardiovascular disease may be a common risk factor - smoking [2]. When assessing a risk factor such as smoking, it was found that 28.4% and 28.3% of the patients we examined were regular smokers in the respective groups, p = 0.644 (Table 3). However, the analysis of the index of a

Table 1

Social status of the surveyed individuals of the Yakut nationality with COPD / CB in the association and without MS, %

Sign		COPD / CB + MS (n=88)	COPD / CB (n=60)	p
Family status	Married	77,3	66,7	0,154
	Lonely	22,7	33,3	
Education	Higher education	20,5	31,7	0,134
	Secondary vocational	48,9	33,3	
	Average total	30,7	35,0	
Employment	Employment Retired	34,1	28,3	0,729
	Brainwork	29,5	38,3	
	Physical work	30,7	28,3	
	Unemployed	5,7	5,0	

Note: In the Tables 1-2 p - significance of differences on x2 Pearson criterion

Table 2

Hereditary burden in Yakut people with COPD / CB in association and without MS, %

Sign	COPD / CB + MS (n=88)	COPD / CB (n=60)	p
Heart diseases	21,6	26,7	0,476
Stroke	17,0	11,7	0,366
Diabetes	9,1	5,0	0,352
Oncological pathology	18,2	10,0	0,170
Arterial hypertension	56,3	51,7	0,578
Diseases of the bronchi and lungs	36,4	28,3	0,216

Table 3

Influence of external factors in persons of Yakut nationality on COPD / CB in association and without MS, %

Sign		COPD / CB + MS (n=88)	COPD / CB (n=60)	p1,2	
Physical training	6,8	13,4	0,3391	0,339[1]	
Physical activity per week (hours), M±m	23,7±1,98	27,9±2,34	0,0002	0,000[2]	
Smoking	Да, регулярно	28,4	28,3	0,644[1]	
	Yes, regularly	28,4	28,3	0,6441	
	YES, PERIODICALLY	4,5	1,7		
	NO, THREW	15,9	11,7		
	No, never smoked	51,1	58,3		
IKS, M±m	8,9±1,51	4,5±1,01	0,0032	0,266[1]	
	Alcohol consumption	Yes, regularly	10,2	3,3	0,2661
	YES, PERIODICALLY	14,8	13,3		
	No	75,0	83,3		

Notes: p1 - significance of differences on x2 Pearson criterion, p2 - significance of differences on Mann-Whitney test

smoking person showed that the value of this indicator in the group of patients with combined pathology was statistically significantly higher - 8.9 ± 1.51 pack-years, than in the comparison group I - 4.5 ± 1.01 pack-years, p = 0.003. Thus, there is a negative characteristic for a greater number of pack-years in COPD / CB patients in combination with MS.

According to alcohol consumption, no statistically significant differences between the groups studied were obtained.

CONCLUSION

Thus, we found that the social status, hereditary burden does not differ in the groups we surveyed. On the risk factors of the external environment in the surveyed, such as physical activity, smoking, alcohol consumption, the frequency of occurrence in groups does not differ. At the same time, a higher index of a smoker and fewer hours spent on physical activity a week are more common in Yakuts with COPD / CB and MS, which negatively affects the risk of cardiovascular complications in this category of patients.

REFERENCES

1. Osakovskiy V.L., Gol'dfarb L.G., Klimova T.M., Sambuugin N., Odgerel Z., Yakovleva M.N., Ignat'ev P.M., Alekseeva L.L., Baltakhinova M.E., Timofeev G.A., Krivoshapkin V.G., Platonov F.A. Metabolicheskiy sindrom u aborigennogo naseleniya Yakutii [Metabolic syndrome in aboriginal population of Yakutia]. Yakutskiy meditsinskiy zhurnal [Yakut Medical Journal]. 2010; 2:98-102.

2. Molenaar E.A., Massaro J.M, Jacques P.F., Pou K.M., Ellison R.C., Hoffmann Udo, Pencina Karol, Shadwick S.D., Vasan R.S., O'Donnell C.J., Fox C.S. Association of lifestyle factors with abdominal subcutaneous and visceral adiposity: the Framingham Heart Study. Diabetes Care. 2009; 32 (3):505-510.

3. Pitta F., Troosters T., Spruit M.A., Probst V.S., Decramer M., Gosselink R. Characteristics of physical activities in daily life in chronic obstructive pulmonary disease. Am. J. Respir. Crit. Care Med. 2005;171 (9):972-977.

4. Anthonisen N.R., Connett J.E., Kiley J.P., Altose M.D., Bailey W.C., Buist A.S., Conway W.A. Jr., Enright P.L., Kanner R.E., O'Hara P. et al. Effects of smoking intervention and the use of an inhaled anticholinergic bronchodilator on the rate of decline of FEV1: the Lung Health Study. JAMA. 1994; 272 (19):1497-1505.

5. Cecere L.M., Littman A.J., Slatore C.G., Udris E.M., Bryson C.L., Boyko E.J., Pierson D.J., Au D.H. Obesity and COPD: Associated Symptoms, Health-related Quality of Life, and Medication Use. COPD. 2011; Vol. 8 (4):275-284.

6. Akpınar E.E., Akpınar S., Ertek S., Sayın E., Gülhan M. Systemic inflammation and metabolic syndrome in stable COPD patients. Tuberk. Toraks. 2012; 60 (3):230-237.

7. Watz H., Waschki B., Kirsten A., Müller K.C., Kretschmar G., Meyer T., Holz O., Magnussen H. The metabolic syndrome in patients with chronic bronchitis and COPD: frequency and associated consequences for systemic inflammation and physical inactivity. Chest. 2009; 136 (4):1039-1046.

8. Tkacova R. Systemic Inflammation in Chronic Obstructive Pulmonary Disease: May Adipose Tissue Play a Role? Review of the Literature and Future Perspectives. Tkacova R. Mediators Inflamm. 2010; 5:859-889.

Information about authors:

Borisova E.P. (Borisova E.P.) - senior lecturer of the Department «Internal Diseases and General Practice (Family Medicine)» of the Faculty of Postgraduate Education of Physicians of the Medical Institute of the Federal State Educational Establishment of Higher Professional Education «North-Eastern Federal University named after M.K. Ammosov «, borisovaep75@mail.ru Yakutsk, Republic Sakha (Yakutia), Russia;

Kylbanova Elena Semenovna (Kylbanova E.S.) - Doctor of Medicine, Head. Department of Internal Medicine and General Practice (Family Medicine), Faculty of Postgraduate Training of Doctors of the Medical Institute of the Federal State Educational Institution of Higher Professional Education «North-Eastern Federal University. M.K. Ammosov «, kyles@list.ru Yakutsk, Republic Sakha (Yakutia), Russia.

Contact information: Borisova Ekaterina Petrovna address: 677005, Yakutsk, ul. Petra Alexeeva 73 sq. M. 24. Telephone 8914 220 67 69.