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Gastroesophageal reflux disease in a combination with metabolic syndrome among inhabitants of Yakutia

ABSTRACT

The analysis of comorbidity of reflux disease and metabolic syndrome at Yakut and Russian population showed that gastroesophageal reflux disease in patients with the metabolic syndrome, regardless of nationality differs by polymorphic clinical course, a higher rate of dyspeptic and extraesophageal symptoms.

Key words: comorbidity, gastroesophageal reflux disease, metabolic syndrome, Yakutia.

INTRODUCTION

The study of comorbidity is one of the most topical issues of modern medicine, as the analysis of character of the combined pathology is essential for timely diagnosis and selection of further treatment strategy. The comorbidity of digestive diseases and metabolic syndrome (MS) has been studied little, and their studies are ambiguous.

According to the Central Research Institute of Gastroenterology (Moscow) a nosological picture of digestive diseases in MS patients is presented as a metabolic triad of disorders of the esophagus, including gastroesophageal reflux disease (72%), diseases of the liver and biliary tract (64%) and colon (68%) [6].

Clinical-morphological and functional features of gastroesophageal reflux disease (GERD) were studied in different age and ethnic groups of the population of Yakutia [1,2,3,5]. However, currently no studies concerning the comorbidity of reflux disease and metabolic syndrome among Yakuts are noted. In this context, **the aim** of this article is to analyze the comorbidity of reflux disease and metabolic syndrome.

MATERIALS AND METHODS

The study involved 140 patients based on the Emergency department of the Republican hospital №2 - Emergency center and gastroenterology department of Yakutsk City Clinical Hospital of Yakutsk from 2010 to 2013. The work is a part of the research project "Metabolic syndrome and chronic non-communicable diseases among inhabitants of Yakutia" (Registration number YSU: 11-01M.2009) approved by the local Committee for Bioethics at the Yakut



Scientific Center of complex medical problems SB RAMS (Protocol №24 dated June 29, 2010.). All patients gave informed consent to participate in the study.

A study group comprised 50 patients with GERD Yakut nationality and MS, including 19 men (38%) and 31 women (62%), with an average age $47,5 \pm 1,48$ years. A control group included 50 Yakuts I GERD without metabolic syndrome - 18 males (36%) and 32 women (64%) in the control group II - 40 Russian with GERD and MS - 14 men (35%) and 26 women (65%). The average age of patients 2 control groups was $46,3 \pm 1,73$ years and $46,9 \pm 1,72$ years, respectively.

The diagnosis was made on the basis of complaints, medical history, physical examination data and results of endoscopic and radiological studies of the upper gastrointestinal tract. Preliminary verification of the diagnosis was conducted in accordance with recommendations of the Mayo Clinic and the Montreal Consensus (2006) with unavoidable presence of patient's troublesome heartburn and / or regurgitation once a week or more during the last 6 months. Esophagitis severity was assessed using a modified classification of Savary-Miller (1996).

Metabolic syndrome was diagnosed on the basis of the recommendations of the All-Russian scientific society of cardiology from 2009.

Statistical processing and analysis of data were performed using the package IBM SPSS Statistics 19. For selection of a statistical criterion in verifying laws of normal-theory polygenic character a Kolmogorov – Smirnov's test was applied adjusted by Lilliefors and a Shapiro-Wilk test. Non-parametric tests were used in accordance with the verification in comparison of independent groups. Pairwise comparisons were performed using a Mann-Whitney test. The comparison of the groups by oligogenic character was performed using a contingency table with calculation of a criterion χ^2 - Pearson. For statistical significance threshold criteria were noted as $p < 0,05$.

RESULTS AND DISCUSSION. The analysis of clinical reflux disease revealed that the leading symptom is heartburn, revealed at the majority of patients, regardless of their ethnicity and the presence or absence of the metabolic syndrome (Table. 1). The patients of the main group suffered from heartburn / regurgitation mainly in the daytime (46%), while the patients of the control group I had this symptom irrespectively of time of a day (52%), and patients of the group II having it significantly more often at night (52.5%, $p < 0.05$). Clear connection of the provocation of heartburn / regurgitation with the reception and content of food was observed at 90% of patients of the main group.



Daily bouts of heartburn were observed in the Russians (52.5%, $p < 0.05$). A smaller number of the Yakuts had heartburn, as 64% of the patients with GERD and with metabolic syndrome complained on heartburn 1 or more times a week including 62% of the patients without MS.

Dyspeptic syndrome was often ascertained in association with reflux disease and metabolic syndrome, regardless of the ethnicity of patients. Thus, a sense of heaviness in the epigastric region was observed in 70% of the Yakuts and 75% Russian, bloating - 68% of the Yakuts and 75% Russian, a sense of early fullness - 14% and 35% of Yakuts and Russian, abdominal pain - 44% of the Yakuts and 62.5% Russian.

Other common symptoms of GERD are chest pain arising in the supine position, especially at night and air burping mainly observed in the case of association with metabolic syndrome (16.3% in Yakuts and 17.5% in Russian; 66% in Yakuts and 77, 5% in Russian, respectively).

Statistically significant differences were not found in accordance with morbidity rate of dysphagia and odynophagia in two groups.

Clinical manifestations of reflux disease were characterized by the presence of extra-oesophageal symptoms in patients with metabolic syndrome, regardless of their nationality, but several symptoms more frequently observed in Russian. Thus, nocturnal cough and hoarseness were noted in 24% of the Yakuts, and 35% and 47.5% Russian, respectively.

These findings are consistent with studies of other authors, noted the impact of MS on the variability of the clinical picture of GERD associated with a high incidence of dyspeptic symptoms and extra-oesophageal symptoms [4,9,10].

During the endoscopic investigation non-erosive (endoscopy negative) esophagitis was ascertained mainly in Yakuts (72% of the main group and 74% of the control group I), while erosive esophagitis - in Russian (70%) (Table 2). The first-degree esophagitis was found in 37.5% of Russian, which was significantly more than the Yakuts with GERD in both groups. The 2nd-degree reflux esophagitis was diagnosed at 16% of the main group and in 20% of the control group II. Circular multiple erosions are twice as likely have been found in Russian, but not statistically significant. Deep ulcerations of the esophagus (ulcers) with bleeding were identified at a slightly higher frequency in Yakuts with MS. Symptoms of cardiac insufficiency pulp were ascertained in almost all patients, but with a slightly higher frequency in patients without MS. Hiatal hernia was observed at every fifth Yakut with MS and with no MS, and every fourth Russian with MS. Duodenal reflux was diagnosed in most surveyed, but with a



slightly higher frequency in patients of the Russian nationality (82.5%). Erosion in the mucous antrum and duodenal bulb was diagnosed significantly more frequently in Yakuts without MS and Russian with MS (Table. 2). Our results are consistent with the published data of other authors [2,7,8].

Polypositional contrast X-ray examination of the upper gastrointestinal tract, carried out in 39 patients of the main group and in 36 patients of the control group I, 28 patients of the control group II, allowed to establish signs of esophageal motor dysfunction and the presence of morphofunctional changes.

CONCLUSION

Thus, our results showed that gastroesophageal reflux disease in the population of Yakutia with metabolic syndrome, regardless of ethnicity, differs with the polymorphic clinical course, higher frequency of dyspeptic disorders and extraesophageal symptoms.



Table 1. Clinical characteristics of GERD

Symptoms	Groups of patients, %			p ⁰⁻¹	p ⁰⁻²
	Main group	Control group I	Control group II		
Heartburn	96	98	95	NS	NS
Regurgitation	14	12	27,5	NS	NS
Connection of heartburn / regurgitation with:					
- a change in body position	90	86	90	NS	NS
- eating	90	48	67,5	<0,001	<0,05
- food content	90	50	70	<0,001	<0,05
Connection with the time of a day:					
- during the daytime	46	20	25	<0,001	<0,05
- mostly at night	30	28	52,5	NS	<0,05
- regardless of the time of a day	24	52	22,5	<0,001	NS
Belching	66	14	77,5	<0,001	NS
Odynophagia	10	16	20	NS	NS
Dysphagia	10	2	20	NS	NS
Severity of epigastric	70	24	75	<0,001	NS
Abdominal distention	68	32	62,5	<0,001	NS
Abdominal pain	44	16	47,5	<0,001	NS
Chest pain	16,3	4	17,5	<0,05	NS
Feeling of early saturation	14	2	15	<0,05	NS
Night cough	24	8	35	<0,05	NS
Hoarseness	24	12	47,5	NS	<0,05
Snore	86	14	75	<0,001	NS
The frequency of heartburn / regurgitation					
1 or more times a month	6	4	2,5	NS	NS
1 or more times a week	64	62	40	NS	<0,05
1 or more times per day	26	32	52,5	NS	<0,05
No heartburn / regurgitation	4	2	5	NS	NS

Note: In the Table 1-2 p⁰⁻¹ - statistical significance between the main group and the control group I, p⁰⁻² - between the main group and the control group II; NS – no significance.



Table 2. Endoscopy

Endoscopic picture	Groups of patients, %			P ⁰⁻¹	P ⁰⁻²
	main group	controlgroup I	controlgroup II		
Non-erosive esophagitis	72	74	30	NS	<0,001
Erosive esophagitis	28	26	70	NS	<0,001
Degree of reflux oesophagitis					
I	2	14	37,5	<0,05	<0,001
II	16	6	20	NS	NS
III	4	6	10	NS	NS
IV	6	0	2,5	NS	NS
Concomitant pathology					
Cardioinsufficiency	84	94	87,5	NS	NS
Hiatal hernia	18	22	25	NS	NS
Duodenal reflux	76	62	82,5	NS	NS
Gastroduodenal mucosal erosion	16	30	55	<0,05	<0,001

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