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SEASONAL PREVENTION OF METEOPATHIC REACTIONS IN PATIENTS WITH COPD

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ABSTRACT

The seasonality of exacerbation of the course of chronic obstructive pulmonary diseases in residents of the cities of Bishkek and Osh was studied. It was revealed that the highest frequency of exacerbations occurs in the month of March, when frequent weather changes occur in the Chui and Fergana valleys. With the invasion of fronts of cold air from the west, a hypoxic type of meteopathic reaction with impaired air pressure is observed. A balm composition based on local medicinal plants has been developed. In the experimental group of patients with COPD, the consumption of balm with tea for 20 days during the period of unstable weather reduced their meteorological dependence.

KEYWORDS: COPD, *Meteopathic Reaction, Balm, Meteorological Prophylaxis.*

INTRODUCTION

It is known that weather factors have a significant impact on the course of chronic obstructive pulmonary disease (COPD) [1]. The meteopathic reactions (MR) in patients with COPD in the conditions of northern Kyrgyzstan are described in detail in the doctoral dissertation of E.L. [4]. It has been shown that 2-3 days before the invasion of the cold air front in meteorically labile patients, the hypoxic type of MR develops, accompanied by a deterioration in the ERF parameters and the surface activity of the surfactant in the exhaled air condensate [5, 6]. After passing the front of cold air, a spastic type of MR develops, in which the severity of ERF shifts decreases, but remains significantly different from the indicators on indifferent days. The issues of prevention of MR in patients with COPD remain poorly understood [1].

The aim of the work was to study the seasonality of MR in patients with COPD - residents of the cities of Bishkek and Osh and the possibility of seasonal meteorological prophylaxis with a phytotherapeutic preparation - a patented alcohol-containing balm.

MATERIAL AND METHODS

Correlation analysis of one of the indicators of morbidity of the population - appealability to the centers of emergency medical care in Bishkek and Osh according to 16 classes of ICD-10 for a period of twenty years (1998-2018) was carried out. The sample included more than 450 thousand cases in total - sections A00-R99, including diseases of all classes. Of these, calls for respiratory diseases - class J00-J99 accounted for 2.6% in Bishkek and 2.2% in Osh (11.7 thousand cases)

For each day of calling an ambulance through the site http://www.gismeteo.ru/diary/5327, containing the archival data of Kyrgyzhydromet, daytime weather indicators were selected for 24 weather stations, including the cities of Bishkek and Osh. The average daily temperature (in degrees Celsius), wind speed (m / s), atmospheric pressure (mm Hg), and the presence of precipitation (yes, no) were recorded. In addition to daily indicators, for illustration, their average monthly and annual values were also taken. Separately, we analyzed the days with sharp weather changes (SHWCH), when the changes in daytime air temperature were 5 ° C or more compared to the previous day). It should be noted that such temperature fluctuations do not occur by themselves, but arise as a result of the invasions of atmospheric fronts under the influence of changes in air pressure. The analysis methodology is described in the guidelines of the WHO European Office "Methods for assessing the sensitivity of human health and adaptation of public health to climate change" [8]. Correlation-regression analysis of medical and meteorological indicators was performed using the SPSS program. The work on the city of Bishkek was carried out under a joint project of the Ministry of Health of the Kyrgyz Republic and the WHO European Office “To develop a program for the health sector of the Kyrgyz Republic on adaptation to climate change for the period 2011-2015”. Work in the city of Osh was carried out within the framework of the research work "Epidemiology, pathogenesis and sanogenesis of human diseases in the changed climatic and geographical conditions of the south of Kyrgyzstan from the standpoint of the international classification of functioning, disability and health", State Registration No. 0007479.

Based on the data of ambulance calls, a focus group was formed of 20 male residents of Bishkek, suffering from COPD with severe meteorological stability. The control group consisted of 20 healthy men of the same age.

We have developed and filed for patenting a composition of a polyphyte tincture (balsam) "Harmony" based on natural medicines of Kyrgyzstan of the following composition: common hops (cones), oregano (herb), peppermint (leaf), thyme (herb), lemon balm (leaves), calendula (flowers), black currant (leaf), barberry (fruit), hawthorn (fruit), cinnamon (bark), coriander (fruit), caraway (fruit), cloves, natural honey, green tea, mountain ash (fruit), blackcurrant juice, cherry juice, sea buckthorn juice,

Nut oil, hot red pepper, citric acid, red wine, aqueous-alcoholic liquid.

The resulting product has the following indicators:

- fortress 40 + -2.5 vol.%,

- spicy-burning, slightly sweetish taste;

- delicate, harmonious aroma;

-reddish brown color;

- transparency with shine;

- Slightly thick, buttery consistency. The focus group patients gave informed consent to the study, formalized by the protocol of the Committee on Biomedical Ethics at Osh State University No. 2 dated March 14, 2020. During the period of unstable weather, late February-March, patients consumed balm with tea (morning and evening), one tablespoon (15 ml) per cup of tea for 20 days.

The condition of patients before and after the course of taking the balm was assessed in points for 15 domains of the International Classification of Functioning, Disabilities and Health (ICF), recommended for use in medical rehabilitation [2, 7].

Results

Bishkek is the capital of Kyrgyzstan, with a population of 800 thousand people, and taking into account new buildings in the suburbs - about a million. The city of Osh is called the southern capital, its population is about 400 thousand people. Both cities are located at approximately the same absolute altitude (750-850 m above sea level), but in different climatic and geographical zones: Bishkek in the northern (Chui valley), and Osh - in the south-western zone (Fergana Valley), the difference is 2 degrees of latitude. The valleys are divided by two mountain ranges. These cities have similar social living conditions. The healthcare organization system is common for the whole country.

These two large cities of Kyrgyzstan have some climatic differences (most noticeable in temperature and precipitation), due to the location and orography of the area, and the peculiarities of the local atmospheric circulation. Differences in the frequency of SHWCH days were also identified (Table 1).

TABLE 1 - SEASONAL STRUCTURE OF THE FREQUENCY OF DAYS WITH SHWCH IN THE CITIES OF OSH AND BISHKEK 2011-2018.

City	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Osh	2	3,75	6,25	5,75	4,0	3,75	2,5	2,75	2,5	6	3,25	3,75
Bishkek	9	7,8	12,4	10,4	4,6	5,6	3,5	3,8	5,8	7,0	10,4	10,4

Note: I-XII - months of the year in order

Correlation analysis revealed connections of different strengths between weather factors (air temperature, atmospheric pressure, presence and incidence of respiratory diseases, reliable both for residents of Bishkek and Osh. Moderate connections (r = + 0.2-0, 4 for the presence of precipitation, and r = -0.2-0.4 for air temperature) are typical for the entire population as a whole. The strongest connections were revealed for children of the first year of life and for elderly and senile men, residents of Bishkek.

The greatest number of calls to patients with COPD fell on February, March and November, while to patients with diseases of the cardiovascular system in the summer months, which we have already described earlier [3].

Therefore, the testing of the balm for meteorological prophylaxis of exacerbations was selected for men in Bishkek in February-March.

The initial severity of domain shifts in the function and structure of the respiratory system, as well as activity and participation in the patients of the experimental group was significantly greater than in the control group (Table 2).

TABLE 2 - DYNAMICS OF ICF DOMAINS IN PATIENTS WITH COPD WITH SEASONAL METEOPROPHYLAXIS

Group	Domains function (f)	Domains structure (s)	Domains activity and participation (d)
COPD before the course	2,3±0,3 *	2,2±0,3 *	2,4±0,3 *
COPD after a course of prevention	1,4±0,3 *,**	1,5±0,3 *	1,5±0,3 *, **
Control	0,5±0,2	0,4±0,2	0,5±0,1

Note: * - the difference with the control group is significant, p <0.05;

** - the difference from the initial level is significant, p <0.05;

CONCLUSIONS

1) During the period of unstable weather in February-March, men of the city of Bishkek with COPD have meteopathic reactions to the invasion of cold air fronts, accompanied by an increase in the severity of violations of the ICF domains.

2) The course of meteorological prophylaxis of polyphite tincture for 20 days reduces the severity of shifts in the MCF domains and reduces the frequency of meteopathic reactions.

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