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METEOSENSITIVITY AMONG MENTAL WORKERS

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ABSTRACT

This study investigates the incidence of meteosensitivity (MS) and its manifestations among intellectual workers, and the correlation between MS and psychological states of the patients. Patients were administered a standardized questionnaire of risk factors (RF) of cardiovascular disease (CVD), including MS; CES-D questionnaire to reveal depression; and self-monitoring map.

Incidence of MS was established in 99 of 196 intellectual workers (50.5%): 34 men (40%) and 65 women (58.6%).

In a group of 33 volunteers with MS, 45.5% were revealed to have various degrees of depression. Among people who exhibited manifestations of depression, the number of days of feeling unwell in relationship to weather conditions significantly exceeded that of people who exhibited no depressive signs.

Most people in the observation group complained of worsening in self-perceived well-being during the days in which the combination of northern or southern winds, high atmospheric pressure, and high humidity was registered. Sensitivity to showers was recorded in 69.7% of individuals with MS.

Results of this study confirm the potential utility of providing self-management education to patients with MS and development of personalized programs for alleviating severity of individual's reaction to fluctuations in certain meteorological parameters.

Keywords: *meteosensitivity, depression, prevention.*

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Physiological meteosensitivity (MS) – the property of the body to maintain its health by harmonizing life-supporting processes with solar, geophysical, meteorological and other processes in the environment.

In a healthy person with good reserve capabilities of adaptation mechanisms, internal processes caused by physiological MS do not cause any painful sensations.

In the case of the weakening of the body due to illness, stress, or exhaustion person may experience pathological meteopathic reactions, often complicating the course of the underlying disease, reducing the effectiveness of treatment, and worsening the patient's quality of life.

Differences in atmospheric pressure, especially spasmodic, negatively affect the circulatory system, vascular tone, and arterial pressure. High humidity also has negative effects on health. During periods of so-called "magnetic storms", a deterioration of well-being is even possible in a completely healthy person, manifested by disturbance in memory and concentration and occurrence of nervous breakdowns. Cardiac patients are most sensitive to various changes in weather conditions [1-5].

It is noticed that people living in cities suffer from meteorological dependence much more than those who live in rural areas. This is explained by the shorter duration of daylight and the disturbance in natural water exchange in urban areas.

In medical practice, one can frequently see patients suffering from meteoneurosis, characterized by the fact that a person, having learned about the upcoming unfavorable changes in weather conditions, adjusts himself to negative emotions and deterioration of well-being.

In recent years, the attention of researchers has been drawn to the problem of anxiety and depression in cardiac patients. Psychosocial factors began to be considered as one of the main causes of a sharp rise in morbidity and mortality from cardiovascular diseases (CVD). According to WHO, by 2020, depressive disorders will take second place as a cause of incapacity for work after cardiovascular diseases [6-9].

Taking into account the foregoing, the study of the possible dependence of MS manifestations on the psychological state of patients and the development of effective methods for its prevention are urgent tasks of modern medicine and, in particular, of cardiology.

The purpose of the study was to study the frequency of occurrence of pathological MS and the forms of its manifestation among mental labor workers, and assessment of the relationship between meteopathic reactions and psychological state of the patients.

MATERIAL AND METHODS OF INVESTIGATION

The study was carried out as part of a preventive examination of the able-bodied population in the organized populations of the city of Baku.

In the present work, the data of survey of scientific employees of one of the institutes of the National Academy of Sciences of the Republic of Azerbaijan is presented.

A total of 196 people were examined (85 men and 111 women). The average age of men is 48.2±1.4 years; women – 42.98±1.5 years.

The presence of the MS factor was established on the basis of the results of a questionnaire survey of patients with a standardized questionnaire to identify the main risk factors for CVD, containing a special cluster of questions related to meteorological reactions.

Of the patients with revealed MS factor, those who voluntarily agreed to participate in the current study were selected as an observation group. A total of 33 people (27 women and 6 men) were selected.

To identify depressive disorders, the patients of the observation group were tested for the CES-D questionnaire (Center of Epidemiological studies of USA – Depression) (Russian version of the questionnaire was used).

In accordance with the objectives of the study, a "self-monitoring map" was prepared for self-completion by the examinees, including the patient's personal data, a list of possible complaints in case of worsening of the state of health, graphs for recording of the objective survey data (level of arterial pressure, heart rate on radial artery, hyperemia, edema, ets.), as well as detailed instructions on its completion.

Daily during the observation period, the main parameters of weather conditions (atmospheric pressure, humidity, wind velocity and direction, air temperature, including available data on the dates on health-related heliomagnetic disturbances) were recorded in the "weather conditions map". Data published on the internet and other mass media was used as the source of information.

This study analyzes data collected during the 3 months of the autumn-winter period (October, November and December). This is due to the fact that during this period there are pronounced fluctuations in the parameters of weather conditions, and during this period the most active participation of patients in the study was noted (this concerns filling out self-monitoring maps).

Statistical processing of the obtained research results was carried out using the standard computer package of statistical programs.

RESULTS OF THE STUDY

A survey of CVD risk factors made it possible to establish the presence of a MS factor in 99 out of 196 mental workers(50,5%): 34 men (40%) and 65 women (58,6%). As mentioned above, an observation group was formed from the number of patients with the established MS factor.

Figure 1 shows the incidence of major CVD risk factors in the observation group. As can be seen from the presented data, the observation group included a significant number of patients with excessive body mass, arterial hypertension, and low level of physical activity.

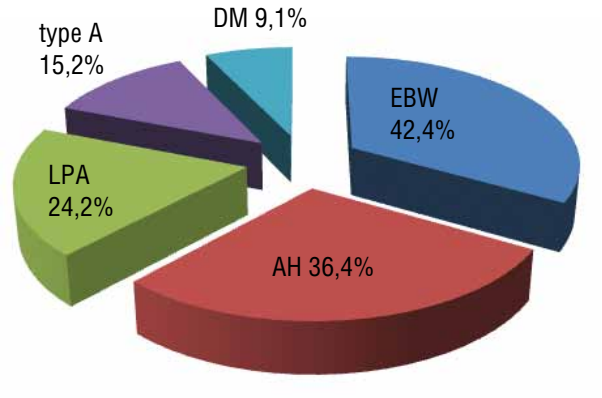

Figure 1. Frequency of occurrence of risk factors for ardiovascular disease among persons with a meteosensitivity factor.
Note:AH – arterial hypertension, EBW - excessive body weight, LPA - low physical activity, DM–Diabetes Mellitus, type A – psychological type of behavior.

Testing of patients of the observation group according to the CES-D questionnaire (fig. 2) made it possible to detect the presence of signs of mild depression in 11 people (33,3%), moderate depression – in 3 people (9,1%), and the presence of signs of severe depression one patient (3%) (the patient was advised to consult a specialist to clarify the diagnosis and correct the detected condition).

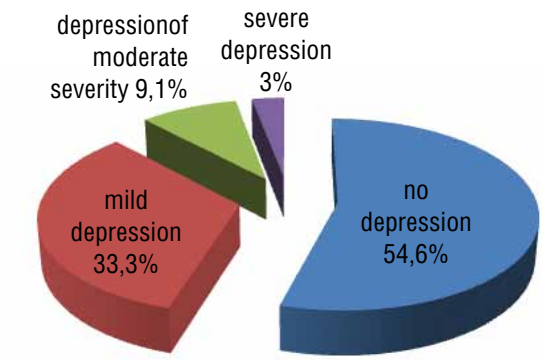

Figure 2. Results of testing persons with meteosensitivity factor by the CES-D questionnaire

According tovsults of self-monitoring map, the number of days which patients marked as days of poor health during the observed period was counted. It should be noted that during the observation period in self-monitoring maps, patients noted from 2 to 10 days of poor health per month due to weather conditions. The average data obtained for each month of observation as a whole, as well as that depending on the presence or absence of depression, and the average monthly indicators for the period of observation are shown in Table 1.

As can be seen from the data presented, for the entire observation period, on average, each patient had 5,1±0,5 days of poor health due to weather conditions. Moreover, in persons with depression, this value significantly exceeded that in persons without signs of depression (6,3±0,7 and4,2±0,6, respectively, $p<0,01$).

Comparison of these self-monitoring maps and a map of weather conditions during the observed period made it possible to identify combinations of weather conditions, in which there was deterioration in the state of health in the majority of patients in the observation group.

Table 1. The average monthly number of days of poor health due to weather conditions among persons with a meteosensitivity factor

Persons with meteosensitivity factor		The average number of days of poor health due to weather conditions			
		October	November	December	For the whole period of observation
total: n=33	M +	5,2	4,5	5,9	5,1
	m	0,7	1,05	1,2	0,5
With depression n=15	M +	5,6	6,3	8	6,3
	m	1,09	1,1	0,6	0,7
Without depression n=18	M +	4,9	3,3	4,3	4,2
	m	1,03	0,9	1,7	0,6
	P=2-3	>0,05	<0,01	<0,01	<0,01

According to the data, 48,5% and 42,4% of the patients, accordingly, in the observation group reported complaints of worsening of the state of health on days when a combination of northern or southern winds was noted with high atmospheric pressure and high humidity. In an equal percentage of cases (24,2%), patients of the observation group presented complaints about the worsened state of health when the north or south wind was combined with high humidity on a background of normal atmospheric pressure, and when the southern wind was combined with high humidity and low atmospheric pressure. It should be noted that the greatest number of complaints of poor health was noted in rainy weather. Reaction to precipitation (rain, thunder) was recorded in 69,7% of the observed.

In the days of declared "magnetic storms", 54,5% of the patients in the observation group presented complaints of worsening in well-being. During the observation period, 17 days with the expected "magnetic storm" were announced, of which only 9 days were marked by patients as days of ill health.

Based on the self-monitoring maps, the main complaints of patients with MS factor and the frequency of their presentation in response to changing weather conditions were studied.

It turned out that during the observed period, in 78,8% of cases, patients complained of headache, in 72,7% of cases – complaints of joint pain, 66,7% of patients noted lethargy, 54,5% of cases – dizziness, 51,5% of patients reported drowsiness, 42,4% of cases reported complaints concerned with pain in the region of the heart and the sensation of dispnea, 33,3% of patients complained of tachycardia, 30,3% of the patients noted depressed mood and tearfulness, and in 24,2% of cases, patients noted a feeling of irregular heartbeats.

DISCUSSION

In recent years, complaints in the periodical deterioration of health due to unfavorable changes in weather conditions of both ill and practically healthy people have become more frequent. Depending on the general condition of the patient, and the presence or absence of chronic disease, manifestations of meteorological reactions to the weather have a different degree of severity and are differently tolerated by patients. But in any case, pathological MS significantly impairs the quality of life, leads to a decrease in performance of both older age groups and young people. In patients with cardiovascular pathology, especially in those who don't receive adequate treatment, meteopathic reactions of the body in response to changes in weather conditions lead to exacerbation of the disease, often with unpredictable consequences. All this justifies the need for a detailed study of the issues associated with pathological MS, creation of conditions for recovery or optimal level of functionality of the reserve capacity for adaptation in both practically healthy and sick organisms, and development of methods for its prevention.

In this study, the frequent occurrence of the MS factor in an organized population of mental labor workers is noted. Practically, every second examinee revealed dependence of state of health on weather conditions (50.5%).

Comparison of these "self-monitoring maps" with the data of the "weather conditions map" allowed us to estimate the average monthly frequency of days of poor health among patients in the observation group, establish the most common symptoms of meteopathy, and assess the most unfavorable combinations of weather conditions on the health of people with MS.

Practically, every second patient with a MS factor in the observation group (45.5%) showed signs of depression of varying severity. According to the present study, the average number of days of poor health due to weather conditions in persons with identified depression was significantly higher compared to those without signs of depression ($p<0.01$).The obtained data indicates that the correction of detected conditions may be necessary for reducing the severity of the reaction of these patients in response to fluctuations in the parameters of weather conditions. In addition, frequent occurrence of the CVD risk factors, such as excessive body weight, hypertension and low physical activity in the observation group, indicates the need for their timely correction to facilitate the patient's tolerance to sudden fluctuations in weather conditions.

The conducted research confirms the expediency of teaching techniques of self-control to patients with an established MS factor. The method used in this study to assess patient's health in connection with changes in weather conditions (comparison of data from "self-monitoring maps" and "weather conditions map" data) provides an opportunity to determine the individual reaction of the patient's health to the changes and combinations of certain parameters of weather conditions. The obtained information will allow the patient (if he or she has no signs of a meteoneurosis) on such days, to consciously and independently, and/or with medical help under an individual program, to control his/her own state of health and reduce the severity of the health reaction to unfavorable weather conditions and prevent the onset of crisis conditions, including CVD exacerbations and complications.

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