

## Philosophy of Medicine

UDC: 613 + 551.5

### FROM PHYSIOLOGICAL TO PATHOLOGICAL METEOSENSITIVITY

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This paper is dedicated to the problem of physiological and pathological meteosensitivity (meteodependency or meteopathy). We introduce and discuss the definition for individual meteodependency, define factors, mechanisms, clinical signs, diagnosis, and approaches to prophylaxy and treatment of individual pathological meteosensitivity.

**KEY WORDS:** weather, meteosensitivity, meteopathy, diagnosis, therapy

### ВІД ФІЗІОЛОГІЧНОЇ ДО ХВОРОБЛИВОЇ МЕТЕОЧУТЛИВОСТІ

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Розглядається проблема фізіологічної і хворобливої метечутливості (метеозалежності або метеопатії). Розглядається індивідуальна хвороблива метеочутливість або метеопатія. Визначаються фактори, механізми розвитку, клінічні детермінанти, діагноз і підходи до профілактики та лікування індивідуальної хворобливої метеочутливості.

**КЛЮЧОВІ СЛОВА:** погода, метеочутливість, метеозалежність, діагноз, терапія

### ОТ ФИЗИОЛОГИЧЕСКОЙ ДО БОЛЕЗНЕННОЙ МЕТЕОЧУВСТВИТЕЛЬНОСТИ

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Излагается проблема физиологической и болезненной метечувствительности (метеозависимости или метеопатии). Рассматривается индивидуальная болезненная метеочувствительность или метеопатия. Определяются факторы, механизмы развития, клинические детерминанты, диагноз и подходы к профилактике и лечению индивидуальной болезненной метеочувствительности.

**КЛЮЧЕВЫЕ СЛОВА:** погода, метеочувствительность, метеозависимость, диагноз, терапия

The problem of meteosensitivity is new and old at the same time. It goes back to the times of Hippocrates [1]. The scientific development, however, began only in the last century, primarily in the Slavic world after the work by Chizhevsky A. «The Terrestrial Echo of Solar Storms» has been published [2]. The Western world did not pay much attention to the problem of meteosensitivity at that time, as evidenced from such manuscripts as «Oxford Companion to the Body» [3].

Meteosensitivity can be physiological and pathological. The latest, pathological meteosensitivity is also known as meteodependency, or meteopathy [4].

Today everything has changed and the problem of meteosensitivity, both physiological and Pathological, became very important. This became possible due to a scientific awareness of the direct impact of meteosensitivity on the human being and his health, which results from Earth climate and space climate changes, from space and Earth

local weather [4]. The problem is exacerbated during radical climate change, and develops as a result of reckless activities of humans that put the life on Earth at the brink of survival [5]. Meteopathy is transformed from an individual to a social problem, involving larger scope of people on the continental and planetary level [4].

If social meteosensitivity is a political feature, individual meteosensitivity is a problem for everybody who is dealing with human's health, mainly for medical practitioners.

The human being is continuously connected to the nature and the reactions of his organism to the climate and weather changes thus are purely natural. These reactions are named as meteosensitivity and are realized through the adaptation to the factors of climate change.

An interface of the human's organism with weather factors is implemented in sensory system located in the skin (temperature, humidity, wind, solar activity, atmosphere electricity, radioactivity), the lungs (temperature, air purity and ionization, humidity, wind), the organs of vision, hearing, tactile and taste sensitivity (light, noise, smell, air temperature and chemical composition), etc.

In healthy human the adaptation to natural changes in climate and weather factors is physiological, and is not accompanied with deterioration of health. These conditions are termed as comfort zone.

When the health is compromised, meteosensitivity becomes pathological and is manifested in the deterioration of mental and/or physical health. The lesser the health resources, the more painful it is. The most susceptible to meteopathic reactions are elder people with chronic diseases. Weather change is associated with an increase in the frequency of depressive reactions, hypertensive crisis, acute coronary and cerebral events, an increase in the frequency of post-surgical complications, as well as with an increase in the frequency of anthropogenic events and catastrophes [4, 6-8].

In the economically developed countries about 38% of healthy men and 52% of healthy women show signs of compromised meteosensitivity, or in other words these people are meteopats [4].

Physiological or pathophysiological meteosensitivity to a large extent depends on the

biological rhythms of the person, the quality and the degree of their synchronization with astronomical natural rhythms.

In healthy person the biological rhythms are physiological, and are synchronized with natural. In the pathological conditions, the rhythms are not just disturbed, but also desynchronized with natural rhythms. Pathological conditions result in the development of new additional rhythms, such as chronic disease with acute events, so called remission cycles [4, 8-10].

Biological rhythms are extremely stable, however, they are not unbreakable. Being tightly connected to external (natural) synchronizers, biological rhythms possess a spectra of stable conditions, and during the frequent change of synchronizers these rhythms transfer from one stage to another, in other words, transfer from one stable condition to another. This transition is realized via so called transitional processes. For daily or circadian rhythms, the duration of transitional processes could potentially take from 5 to 40 days.

The highest rate of disturbances in biological rhythms (desynchronizes) occurs during the transitional processes. Desynchronizers in many cases are a manifestation of clinical syndromes of many diseases. Make your conclusions yourselves [4].

The very first factor of meteopathy is a genetically determined constitutional characteristic of the human organism. Although it is impossible to avoid genetical heredity, prophylactic measures can narrow down their channel and provide an option for safer navigation between «whims of weather».

Meteopathy is a fate for «weaker» sex. Females react stronger to the weather changes. The reason for this is speculated to be found in the hormonal background; however, it is not narrowed to only one this feature.

Among the most meteodependent are children, in which it is pronounced until the regulatory and adaptation systems have not finished their development. The minimal meteodependency is observed from 14 to 20 years of age, and is further exacerbated. At the age of 50, the half of the Earth population establishes permanent meteodependency due to a decrease in the adaptation and an increase in comorbidities.

Habitants of big cities are more prone to meteopathic reactions comparing to smaller

cities populations and villagers. The main reason is found in the severe ecological environment, in the overload of air with heavy ions, shortening of the day light time, a decrease in the ultraviolet intensity, and a strong effect of technogenic, social and mental factors on the development of chronic distress. The further human is from the Nature, the stronger meteopathic reactions are.

Additional features that contribute to meteopathy include obesity; hormonal changes during puberty, pregnancy, and climax; mental state; cardiovascular diseases; trauma; acute respiratory viral and bacterial infections; a decrease in social-economic and ecological environment; etc.

Meteopathy can be recognized with foreboding the weather change and associated deterioration of health:

- decrease in physical activity,
- development of depressive states,
- discomfort (including pain) in different organs and systems,
- absence of other possible reasons for such a decrease in the wellbeing,
- an exacerbation of current disease,
- recurrence of such manifestation during change of climate and weather,
- a rapid improvement during a positive change in climate and weather.

International disease classification (IDC 10) does not have a section for meteopathy, and it is attributed to special (disadaptive) organism reactions to stress: F43.0 – Acute stress reaction and F43.2 – Adjustment disorders [11].

Meteopathy diagnosis is based on the identification of severe meteodependency in the patient and his relatives in the past, with a dynamic follow-up of his condition in the present time, and with an evaluation of the dependency from the climate and weather changes.

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Preventive measures for meteopathy include healthy life style (appropriate rest, physical exercise, contrast temperatures, eating habits, and physiotherapeutic procedures if needed); tracking the weather change with an appropriate prophylactic measures; introducing the pharmacological therapeutic measures according to the patient's state, resources, and comorbidities.

There are three types of preventive measures for meteopathy – one-time, routine, and seasonal. One-time measure is applied to people with meteodependency without chronic somatic pathology and is introduced 1-2 days prior to weather change. Routine measures are attributed to meteodependent people with chronic somatic pathologies, and start 1-2 days prior to and continue 3-5 days after the weather change. Seasonal measures are applied to meteodependent people with chronic somatic pathologies during transitional seasons and according to their physical state, weather, and reactions to weather change.

One reason for the low efficiency of the treatment of chronic diseases is underestimation of the significance of meteopathic reactions of the patient.

Pathological meteosensitivity is accompanied with a distress in the neural system, renin-angiotensin-aldosterone system, cytokine and other regulatory systems. Hence, depending on the patient's state, therapeutic approach to meteopathy can also include the use of potassium channel blockers, beta-adrenergic receptor blockers, blockers of angiotensin receptors, etc.

Physician is treating not the disease, but the patient, and the effectiveness is in many cases determined by solving the problems associated with a compromised meteosensitivity or meteopathy.

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