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New approaches to the assessment of pathogenicity of weather conditions and aerosol pollution of the atmosphere for resorts

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Under rapid variations in weather conditions and atmospheric-pollution regimes on both regional and global scales, a physiological response of human organism to such pathogenic effects and their consequences for the health of people, first of all, patients with a lower accommodation are still insufficiently studied.
A multifactor assessment of the pathogenic effects of weather conditions and aerosol pollution of the atmosphere on the health of 200 people with a lower accommodation was made. Among these people who underwent a course of treatment at the mountain resorts in the north-Caucasian federal district of Russia (Kislovodsk and Essentuki), there were 110 children with respiratory diseases, 60 adults with metabolic syndrome, and 30 adults with irritated bowels syndrome. Data obtained at emergency stations on the complaints of local residents (3000 people) who asked for medical advice on account of their worse health were also analyzed.
The types of adaptive response, the levels of reactivity, meteopathic reactions (on the basis of 24 routine tests), and the indices of neurovascular reactivity and thermoregulation were assessed for the indicated groups of patients. Both autonomic and hemodynamic indices, lipid metabolism, glycemic profile, and protein blood fractions were also determined. The dynamics of meteorological parameters and geomagnetic activity and the levels of both aerosol and trace-gas pollutions of the atmosphere were analyzed for the period of a medical supervision of these patients.
The averaged physiological pathogenicity indices (APPIs), which reflect the degree of the pathogenic effects of weather conditions and aerosol pollution of the atmosphere on different self-regulating systems of patients with a lower accommodation, were substantiated. The APPI takes into account the level of reactivity of human organism (according to the signal parameters of the leukocyte formula and neurovascular responses to standard stimuli), standard clinical-reactivity tests, meteopathic reactions, the types of somatic and autonomic disorders, the presence of syndromes (asthenic, neurotic hysteria-like, psychasthenic, pathocharaterological, anemic, allergic, and cerebroasthenic), and the dynamics of autonomic and hemodynamic parameters and indices that characterize the function of digestive apparatus and circulation and hematosis organs.
The highest meteosensitivity (85%) was found in patients with metabolic syndrome. The APPIs have been used in the system of medical weather forecast for the mountain resorts and is to be used in developing preventive measures for patients with metabolic and irritated-bowels syndromes.

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