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RELATION OF METEOROTROPIC REACTIONS IN CARDIAC PATIENTS TO ATMOSPHERIC - ELECTRIC FACTORS

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There is considered the relationship between the condition of cardiac patients and the variability of the atmospheric electric field. It has been observed that great changes of the atmospheric electric field potential gradient with values going from positive to negative, primarily, were accompanied by the worsening of the condition of some cardiac patients. These findings could be applied in practice for the prevention of meteorotropic reactions.

Most scientists consider the meteorotropic reactions to be caused by sharp changes of the atmospheric pressure. These variations of the pressure occur as atmospheric processes change during frontal passages. But, in these conditions, other atmospheric characteristics can change too. Attention was drawn to the atmospheric electric field behavior. The continuous records of the atmospheric electric field potential gradient at the ground for some months in 1985 [1], 1997 and 1998 were compared with the similar records of the atmospheric pressure . A good correlation was found between sharp large changes of the pressure and large changes of the potential gradient. In January 1997 and January, February, March 1998 the statistics for the state of the groups of cardiac patients were obtained, including the daily amount of their requests for a medical care. The patients were under treatment at sanatorium "Sestroretskiy kurort" near Saint-Petersburg. The potential gradient and atmospheric pressure data were correlated with the medical statistics. It was found that the amount of requests increased considerably and the acuity of deseases became stronger over periods of sharp changes of the electric field and the pressure, which fell on the winter and spring seasons mainly. The data were presented at several medical practical conferences and All-Russia conference "Atmosphere and man's health" [2]. As a typical example we refer to Fig. 1. It shows courses of the atmospheric electric field potential gradient V' near ground, the atmospheric pressure change DP, the daily amount of the requests of cardiac patients for a medical care over February 17 - 19, 1998. On the abscissa the Greenwich time is plotted, on the ordinate axes V', DP and m are plotted. V' is expressed in Volt/meter, DP - in millibars, m - in the number of cases. One graduation on the ordinate axis is 20 V/m, one millibar, one request for a medical care. DP was calculated from the atmospheric pressure tendency. The initial value of DP was prescribed arbitrarily. The legend is to the right of the plot. The rise of an amount of requests was ascribed to a rise of meteorotropic reactions in cardiac patients with the large variations in the atmospheric pressure and electric field.

To reveal the factors which could be the causes of meteorotropic reactions, attention was given to the observations in the summer - time. It is in summer months that the considerable variations of the electric field occur on the background of the less pronounced changes of the atmospheric pressure. The studies were conducted in May, June 1998. This period was characterized by a changeability of atmospheric processes. As before, the atmospheric pressure and electric field observations were carried out together with daily observations for the state of cardiac patients.

The following main results were obtained.

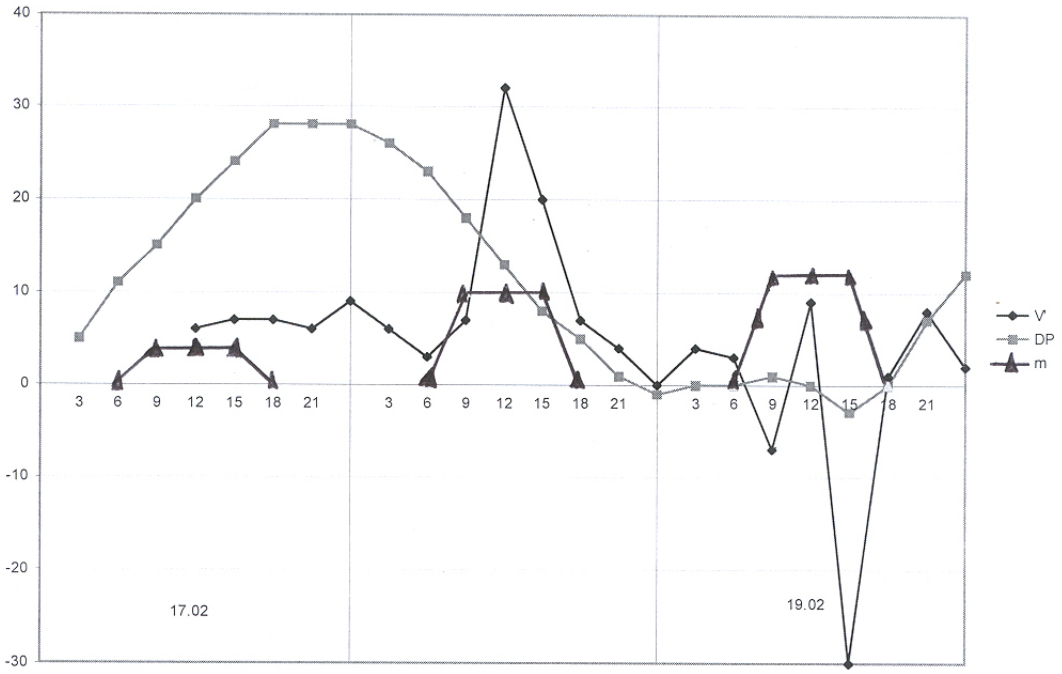
Firstly, it is confirmed that a good correlation is between the large changes of the atmospheric electric field potential gradient at the ground V' and the meteorotropic reactions in cardiac patients. As typical examples we refer to Fig. 2 and 3. As shown in Figures, the reactions appeared in the less pronounced changes of the atmospheric pressure. These were equally sharp as in winter and transitional seasons.

Secondly, it is shown the atmospheric electric potential gradient change precedes the atmospheric pressure drop in the event that prefrontal systems of clouds and precipitation exist. The occurrence of these systems, as a rule, is connected with passages of a warm front or an occlusion front. With an internal cloudiness or a cloudiness beyond a cold front which are mostly of convective forms, sharp changes of the atmospheric electric field can occur on the background of the less marked changes of the atmospheric pressure or even with its rise. Nonetheless an incidence of meteorotropic reactions in cardiac patients increased and their acuity became stronger with the large changes of the atmospheric electric field in all cases that were under investigation.

Thirdly, a formation of large atmospheric electric field potential gradient anomalies is primarily due to a formation of cloudiness and rain fields. As for the atmospheric pressure, its changes therewith relate to attendant other than governing factors responsible for the meteorotropic reactions in cardiac patients.

The continuous atmospheric electric field observations were made at the station "Voeikovo" located 47 km from the sanatorium. It does not matter if meteorological processes of the large scale are considered and the averaged measurement data are used. (The three - hours averages were used in this work). However, to obtain the supporting evidence in favour of a conclusion that the atmospheric electric factor is of the first importance in the manifestation of the meteorotropic reactions it is of value to concentrate all observations at one place. It is significantly especially for work in summer.

It is necessary to carry out more careful and detailed watch of cardiac patients over periods of broken weather, including biochemical blood tests etc., at a later time.



Hours

Fig. 1. The atmospheric electric field potential gradient V' near ground, the atmospheric pressure change DP, the daily amount m of the requests of cardiac patients for a medical care over February 17 - 19. 1998.

On the abscissa the Greenwich time is plotted. On the ordinate axes V',P , T and m are plotted.

V' is expressed in decavolt/meter, P - in millibars, T - in ^{0}C , m - in the number of cases. One graduation on the ordinate axis is one daV/m , two graduations on this axes are one millibar, one ^{0}C, one request for a medical care.

The initial zero value of the ordinate axes was prescribed the value of P = 1000 millibar.

The legend is to the right of the plot.

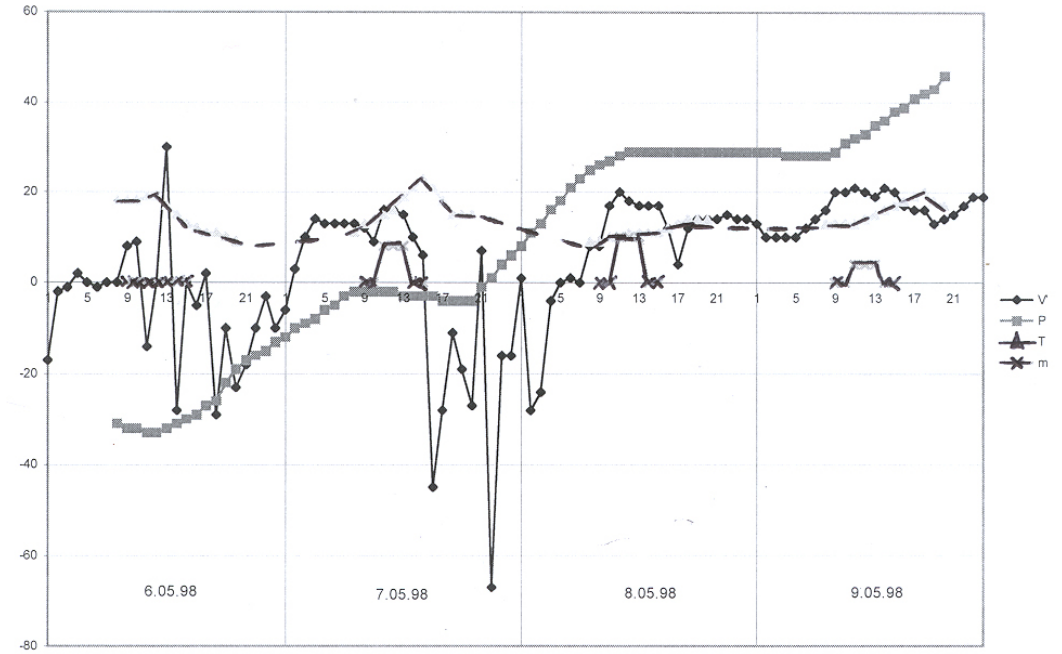


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Fig. 2. The atmospheric electric field potential gradient V' near ground, the atmospheric pressure P, the air temperature T, the daily amount m of the requests of cardiac patients for a medical care over a period of May 6 - 9, 1998.

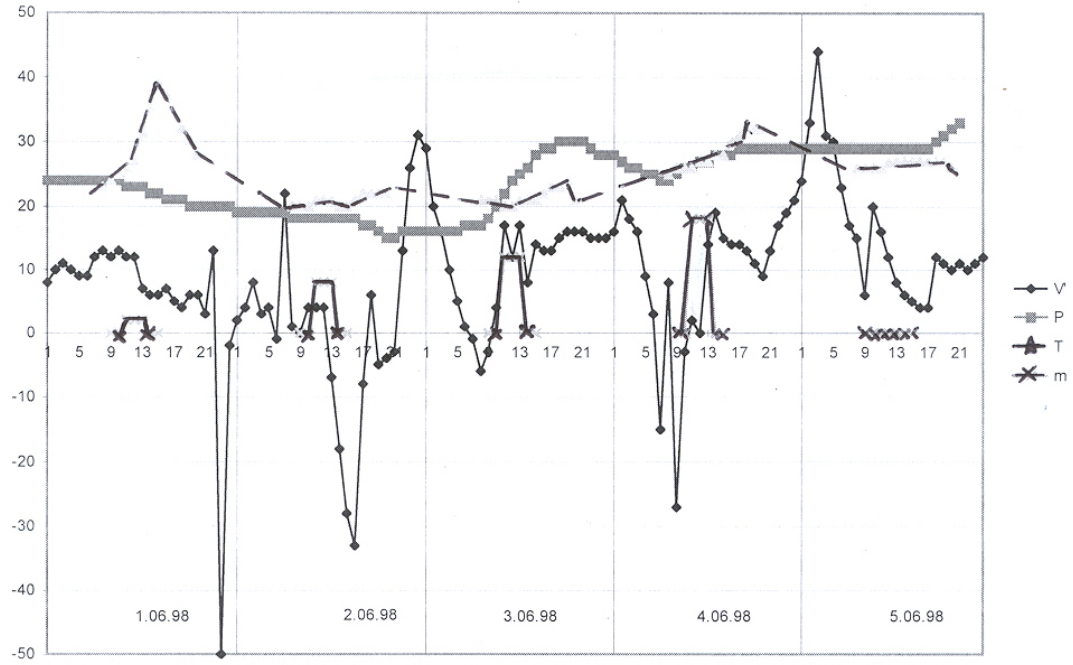

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Fig. 3. The same that is on Fig. 2 over a period of June 1 - 5, 1998.

References

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