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HIGH-ALTITUDES AND BRAIN DAMAGE

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The experiences from expeditions to high mountains confirm unequivocally that staying at high altitudes without the use of oxygen, may cause serious disturbances, both somatic and mental ones. We also know that the most dangerous complications of mountain sickness, that is high-altitude cerebral edema (HACE), may develop at considerably smaller altitudes. Unfortunately, the majority of these accidents turned out to be fatal. However, we are still not fully familiar with the causes and pathomechanism of this disease. Medical examinations conducted among those who survived the HACE also have not explained the nature of this disease.

A case from my own practice in Bolivia: an 18-year old man had come down with high-altitude cerebral edema shortly after his arrival in La Paz (4100m above sea level). He was transported by plane to the level of 400m above sea level in a critical condition. Once there, he recovered quickly. Medical examinations have only confirmed a decreased breathing area of the lungs and an increased sensitivity to hypoxia. Despite the severe condition of the patient and a 3-day long loss of consciousness, no symptoms of brain damage have been discovered.

I would now like to present briefly my experiences connected with the many years of psychiatric and psychological research in a 44-person group of Polish alpinists - participants of expeditions into the Hindu Kush mountains, the Himalayas and the Andes. I myself participated in 3 of these expeditions as a physician and alpinist. The examinations carried out in accordance with the established methodology)i.e. psychiatric and neurological examinations, followed by EEG and psychological tests of Bender, Benton and Graham-Kendall) were conducted before and after the expedition. They were also repeated at a later period. In the group 44 alpinists subjected to investigations, symptoms of organic brain damage in the effect of staying at high altitudes, were observed among 11 persons. The group in question was characterised by: a long period of mountain climbing, acute form of high altitude sickness with brain complications (loss of consciousness, disturbances of orientation, muscle spasms, disturbances of perception), prolonged stay at the altitude of above 7000m above sea level, incidence of symptoms of somatic deterioration in the form of a considerable weight loss (in case of one alpinist, the loss amounted to 25 kg in the course of 3 weeks).

High-Altitudes and Brain Damage (continued)

Symptoms of brain damage were diagnosed, above all, in the course of psychiatric examinations: in the psychopathological picture, it was emotional, characterological and intellectual disturbances that predominated. In the EEG recording, there occurred a lowering of the amplitude and a desynchronization of the bioelectrical activity with scattered theta waves. In two cases, there occurred focal symptoms as well as symptoms of paresis. Symptoms of organic brain damage were confirmed also by psychological tests. Among 8 persons in this group, there occurred a decreased sexual drive (libido). Many years of observations have confirmed the permanent and protracted character of the above-described disturbances. Alpinists who experienced skull and brain injuries have been excluded from this group.

I am convinced that we are dealing here with a new clinical phenomenon. The results of my research indicate unequivocally that in some cases, the traumatic experience at high altitudes may be so deep that it may lead to a permanent brain damage. In my publications up till now, I have referred to this sickness syndrome as HIGH ALTITUDE CEREBRAL ASTHENIA (HACA). I distinguished 3 main forms of this sickness: the characteropathic, encephalopathic, and neuroplegic. In the first of these, it is emotional disturbances that prevail; in the second, the prevailing symptoms are those of a focal brain damage; whereas in the third one, the predominant symptoms are those of peripheric neurological dysfunction in the form of paresis. In the DSM III, there is no equivalent for high-altitude cerebral asthenia. It seems that there is good reason to take into consideration the specific causes of this syndrome, the characteristic picture of the disease, and introduce a new name describing damage done to the brain in the effect of altitude stress.

Adopting a new clinical syndrome, HACA broadens our knowledge about the pathology of high altitudes. For HACA consitutes a further step in the acute mountain sickness and high altitude cerebral edema. One may present it in the form of the following pattern: Acute Mountain Sickness-High Altitude Edema-High Altitude Asthenia

AMS ----------> HACE ----------> HACA

A careful examination and acquaintaince with world literature on this subject shows my observations are not, by any means, isolated. Many authors, particularly physicians who participated in expeditions into high mountains, emphasize the incidence of various psychological deviations, long after the termination of the expedition. I discuss it in detail in my publications, among others in my post doctoral dissertation which has been translated into English, however, it has not yet been published (only excerpts have appeared in the form of articles.

In conclusion, I would like to suggest the organization of a separate symposium devoted to the problem of remote and permanent brain damage in the effect of altitude stress. I could then present the results of my 20-year long observations and research in this field.