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Psychological and Physical Features in Hypertension

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ABSTRACT

Neuroendocrine hypertension can be pure, i.e., when only one etiological factor predominates, or the causes can be intertwined, hence it is called essential or mixed endogenous hypertension, which can be either hypertonia or hyperpiosis, depending in general on the time of evolution of the disease. Essential hypertension is, therefore, a neuroendocrine hypertension that encompasses psychogenic, diencephalic, pituitary (adrenal), renal and arteriosclerotic causes; all of them are intertwined and enlarged, although discretely, but continuously, acting together and in constant intensity, becoming significant to produce a permanent arteriolar vasoconstriction and leading, finally, to an irreversible vascular lesion, that is, to arteriosclerotic hyperpiesis. It is the concept of multiple causes, resulting from an algebraic equation in which many forces operate in an associative character. However, in essential hypertension, the most important initial etiological factor is psychogenic, not excluding, of course, the genetic factors that determine vascular hyperactivity, enzymes and stabilizing hormones. In neuroendocrine hypertension, our causes are almost always intertwined: it is the so-called essential hypertension; but sometimes we can distinguish a single cause or the predominance of one of them, and when this happens, neuroendocrine hypertension is called etiological. Psychogenic hypertension: in order to understand the relationship between psychic and organic states, we will remember that intense reactions, starting from the cerebral cortex, follow a path passing through the thalamus (corticothalamic projection) and the mammillary bodies (mammalothalamic pathway).

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Introduction

High blood pressure or hypertension is a chronic disease characterized by high levels of blood pressure in the arteries. It occurs when the values of the maximum and minimum pressures are equal to or exceed 140/90 mmHg (or 14 by 9) [1].

In the United States, 25% of the adult population has hypertension, and at the Mayo Clinic, by 1950, 6,300 cases were diagnosed in 100,000 patients [2]. Hypertension ranks second as the "cause of death" of organic diseases in the United States. Donnison found only one hypertensive individual in 1,000 African natives aged 15 to 80 years (maximum 17.2), but in good health; in China, in the Australian Aborigines and Eskimos, hypertension is rare [3,4]. Hypertension is, therefore, a disease of civilization. We must study it in detail, especially its emotional factor, because it is, in its essence, a cardiovascular neurosis.

Arterial hypertension can be benign (in terms of ovulation time and slowness of vascular degeneration) and malignant (in which generalized spastic phenomena predominate, causing death more or less quickly).

Benign hypertension, in its final mechanism, is a vasoconstriction of the arterioles, determined directly by nervous excitation or by means of hormones; however, the cause of this vasoconstriction, as we shall see, is very complex.

Essential Hypertension

Neuroendocrine hypertension can be pure, i.e., when only one etiological factor predominates, or the causes can be intertwined, hence it is called essential or mixed endogenous hypertension, which can be either hypertonia or hyperpiesis, depending in general on the time of evolution of the disease. Essential hypertension is, therefore, a neuroendocrine hypertension that encompasses psychogenic, diencephalic, pituitary (adrenal), renal and arteriosclerotic causes; all of them are intertwined and enlarged, although discretely, but continuously, acting together and in constant intensity, becoming significant to produce a permanent arteriolar vasoconstriction and leading, finally, to an irreversible vascular lesion, that is, to arteriosclerotic hyperpiesis [5-9]. It is the concept of multiple causes, resulting from an algebraic equation in which many forces operate in an associative character. However, in essential hypertension, the most important initial etiological factor is psychogenic, not excluding, of course, the genetic factors that determine vascular hyperactivity, enzymes and stabilizing hormones.

Neuroendocrine Hypertension

In neuroendocrine hypertension, its causes are almost always intertwined: it is called essential hypertension; but sometimes we can distinguish a single cause or the predominance of one of

them, and when this happens, neuroendocrine hypertension is called etiological.

Psychogenic hypertension: in order to understand the relationship between psychic and organic states, we will remember that intense reactions, starting from the cerebral cortex, follow a path through the thalamus (corticothalamic projection) and the mammillary bodies (mammalothalamic pathway) [10-12].

On the other hand, bundles that come from the frontal lobe go to the thalamus and from there, through the paraventricular route, they go to the anterior hypothalamic nuclei; still other beams establish communications between the hypothalamic nuclei and the cerebral cortex.

Pure psychogenic hypertension, the initial phase of the essential hypertension, is found in 32% of cases [13].

It can be said that this type of hypertension is a disease of the present time [3,14,15]. Individuals with monetary difficulties, with dissonances from daily life, and living intensely in all branches of human activity, with great responsibilities, are particularly prone to this ailment. Clinical practice has long shown the relevant influence of psychic instability on the genesis of hyperpiesis.

Strong cerebral reactions, such as fear, depression, anguished and pessimistic thoughts, and other psychic excitements, in short, all these intense and persistent, or even frequent, instabilities contribute powerfully to the unleashing of this disease. Philosophers have long said: "The speed of our machines is too great for a tired organism... the heart and the muscles belong to the jungle; the spirit, to an environment of its own making" [14].

Donnison, studying the psychic factor in 117 hypertensive patients, observed that 115 had nervous lability [3]. He used, in addition to the clinical examination, the Cannon emergency reaction. He concluded that this mental tension is more common in civilized people and that hypertension results, in most cases, from psychoneuroses. In fact, this same author examined 1,000 African natives aged 15 to 80 years and found only one hypertensive individual (with a maximum of 17.2), but in good health. He pointed out, on the other hand, that the great daily tension in which the civilized live, as a result of modern life, has its effect on individual physiology as well as on race.

Such are the Observations

Blood pressure (Maxim) / mmHg			
Age	**Cases**	**Native**	**Civilized**
15-19	99	123	123
20-24	100	122	125
25-29	100	126	126
30-34	115	126	127
35-39	100	125	128
40-44	93	118	129
45-49	96	113	131
50-54	100	109	133
55-59	100	106	135
60	97	105	140

Psychogenic hypertension originates in the cerebral cortex, producing a labile and then a persistent rise in blood pressure. It begins with a disturbance in the normal, inhibitory regulation of the cortex over the vasomotor centers of the visceral brain and hypothalamus. The loss of the inhibitory action of the cortex may occur due to an organic factor (tumor, etc.).

In an individual with a hypertensive encephalopathy stroke, hypertension tends to be higher on the hemiplegic side; the same happens with a subcortical tumor, hypertension is greater on the opposite side [16].

Blood pressure figures are closely linked to variations in emotional attitude: if of hostile anxiety, the pressure rises; and if it is defeated, it descends.

Evans found that blood pressure can rise after a simple explanation of how to inhale an amyl nitrite capsule, which also produces anxiety [17].

Zamyslova, leaving a patient in a quiet room, normalized his blood pressure, but if there were strange noises, words, etc., the individual became hypertensive; on the other hand, working under tension and boredom also increased the pressure and, at the same time, the chronaxia was short (it is Lapicque's subordination chronaxis, which depends on the sympathetic center of the hypothalamus) [18].

Venous depression increases in the course of hypertensive disease; the capillaries become more tortuous and the venous part more dilated according to the duration of hypertension and in disagreement with the tension figure. Burch with the method of reoplesthysmography and the segment of the vein of the arm of a normal man, verified that the nervous system controls the peripheral circulation; deep inhalation increases venous tone, classifying it as alphadeflection (change in the caliber of the precapillary vessels) and betadeflection (in the postcapillary vessels) [19]. The mere approach of an injection needle causes the nervous tone to increase, confirming the experience of Tolubeeva and Flegontova, and thus also after a very unpleasant conversation, as mental exertion increases venous tension [20]. Myasnikov by immersing the arm in cold water, or by using suggestion or exhausting work, obtained more pronounced peripheral vasoconstriction in hypertensive patients; even with the introduction of the arm into the hot water, they reacted more sharply [21].

Several mechanisms intervene in psychogenic hypertension in addition to those already mentioned, such as increased cardiac performance (which is a special characteristic of hyperthyroid hypertension with divergent hypertension), peripheral vasoconstriction, increased blood viscosity, decreased clotting time associated with a decrease in blood flow. According to Schneider and Zangari, anxiety, fear, tension, anger, and hostility shorten clotting time and increase viscosity and blood pressure; these alterations represent a protective reaction necessary, in a short period of time, when there is a loss of blood during a fight (short clotting time and increase in viscosity), to increase oxygen transport (increase in viscosity and increase in hematocrit) [22]. The hypertensive patient is constantly in "chronic combat", and there is then this blood alteration, which would favor thrombosis (short clotting time and increased viscosity), and would also lead to an increase in the work of the heart to overcome peripheral resistance. It is possible that peripheral vasoconstriction is more costly to the body than increased cardiac output and seems to be

characteristic of hypertension in the sense of adapting to stressful life experiences. These experiences already mentioned show the changes that take place in the cardiovascular system, in the sense that the individual adapts to these daily conflicts. In the first phase of hypertension, increased peripheral resistance can be interpreted as a means of increasing peripheral circulation and promoting greater demand on muscles and altered tissue metabolism; it is only over time that this psychogenic type of hypertension turns into hypertension with renal insufficiency, that is, into hyperpiesis.

The heart of a healthy and calm individual responds to the situation of a normal exercise with an increase in stroke volume and performance, and after minutes returns to a normal state; however, under the action of an emotional trauma, the heart responds, after the end of this same exercise, in a different way: it continues to function as if it were performing additional work, similar to that produced by strenuous muscular work.

Wolf et al, carried out a series of experiments concluding that healthy individuals, but who perform a task without skill, have an increase in blood pressure, increase in stroke volume and decrease in respiratory efficiency, and these symptoms persist for 48 hours if the task resulted in failure; the same reaction occurs in emotional conflicts arising from anger or tension due to domestic difficulties, infection, or even if individuals are staying overnight [23]. An individual's heart may, during periods of compulsion, function differently (arrhythmia, increased cardiac output and contractile force) and its diaphragm may vary its movements (dyspnea), as if the individual breathed only with the upper chest.

Precordial pain results not only from myocardial ischemia but also from an energetic and persistent contracture of the intercostal, pectoral and dorsal muscles. Decreased coronary circulation is often associated with feelings of defeat, danger, and despair. It is not caused exclusively by fear of death, it can be by loss of love or abandonment. Adsett et al, found in 30 men, using the radioactive Diodrast technique to measure coronary flow, that stressful interviews increased the release of noradrenaline and adrenaline through feelings of anger and anxiety [24].

Paroxysmal sinus and nodal tachycardia and atrial fibrillation may be triggered during certain conflicts, as well as the electrocardiogram recorded during an interview with patients with precordial diseases reveals alterations in the rhythmic frequency and even modification of the T wave. If they were recorded under baseline conditions, they could be considered abnormal. As noted, strong emotions affect the circulation of the entire organism.

Kaplan et al, based on the fact that hypertensive patients had more aggressive dreams than other neurotics, obtained increased blood pressure in hypertensive patients through hypnotic dreams in which the individual was prevented from externalizing hostility [25]. In hypnotic suggestion, inducing two conditions: 1) being unjustly admonished without being able to react. 2) saying to be on guard, because he would be robbed and finally in third place, predicting that the skin temperature would rise in the first case, and the diastolic pressure in the second case; the results were positive.

Wolf and Wolff obtained a positive cold test (hyperreactive) when the patient was thinking of undergoing a sympathectomy, but when the decision was suspended, i.e., the operation was not necessary, the pressure decreased and a hyperreactive response to the test was obtained [26]. Gottschalk et al, measured scales designed by the author himself, qualifying the hostility and anxiety of 13 hypertensive patients and found a significant correlation between introverted hostility and hypertension rates, especially in patients with fixed hypertension; hostility was not modified by the action of chlorothiazide, although there was a drop in pressure [27].

Obrist found tachycardia, increased systolic blood pressure and peripheral vasoconstriction in 28 students submitted to noxious stimuli (acoustic, optical, cold test, mathematical problems and free associations of ideas) that produced great mental effort, and found tachycardia, increased systolic blood pressure and peripheral vasoconstriction, which did not occur through the sympathetic but through a specific response [28]. Schachter understands that hypertensive patients express less anger (psychologically) than normotensive individuals; In 18 hypertensive patients, anger, pain, and fear increased blood pressure more than normotensive patients [29].

The personality of hypertensive patients has been studied by Binger, Alexander and Dunbar however, it should not be given too much importance because it reveals only a predisposing and non-determining condition; on the other hand, there are no diseases, only sick people [30-32]. However, it is interesting to emphasize the differences between individuals with various diseases, since those who suffer from cardiovascular syndromes are very similar to each other and differ from those who suffer from diabetes or are prone to accidents. Storment was unable to statistically confirm the personality of hypertensive and anginal patients in 25 hypertensive patients and 8 coronary patients [33]. However, it is interesting to mention it, because we will find this personality in some cases and we need to be alert to the proper prophylaxis.

This hostile, repressed tendency of the hypertensive patient is in agreement with Cannon's experimental observations in which fear and anger produce an increase in blood pressure in animals [34]. The Rorschach test has revealed that psychogenic hypertensive individuals are individuals with conflicts between the need for passive dependence and aggressive dogmatic impulses; they have obsessive self-doubts, depressive anxieties, critical introspection, and are poor performers [35].

Importance of the mold period: the psychosomatic examinations practiced by Miller de Paiva in psychogenic hypertensive patients revealed stories related to the childhood of insecure, dissatisfied, submissive, but rebellious individuals, confirming the importance of the mold period [13]. There was a significant incidence of the influence of parents whose temperament predominated as follows: worried, flustered and irritable.

Miller de Paiva reports that the vast majority of hypertensive patients had been, in adolescence, shy and hypersensitive, both in love and domestic or social conditions [13]. Hypertensive people are called "bad stars", flawed during life, and, as we have seen, some of them who occupy prominent and responsible situations, feel insecure, dissatisfied (the eternal dissatisfied), vacillating (even in solutions to domestic problems) and unable to calm down to make their relationships satisfactory. These hypertensive people are irritable, hyperemotional, sentimental and are always on the defensive, really fighting, but afraid to fight even in solid positions and in privileged financial situations.

The main characteristics we found in psychogenic hypertensive patients were: worry, flurry, irritation, dissatisfaction, although they like to live, and finally a hostility that does not allow them to express themselves freely and when they do, they go into anxious depression.

Psychoanalysis and hypertension: Alexander's psychoanalytic study of hypertensive patients reveals that they are individuals with inhibited aggressive impulses, always associated with anxiety; he cannot express hostility freely, giving the impression of a mature and well-adjusted personality [31]. Hypertensive patients try to be pleasant and complacent, not bothering to get upset about helping others, in order to overcompensate for a feeling of inferiority. Alexander cites an anxious businessman with fantasies of dominating his rivals but who had a complacent, modest attitude; on one occasion one of his employees invited him to play golf and, when he left work, he accused himself of having accepted the invitation and of having been so unskilful as not to accept it; he became angry and with feelings of self-contempt [31]. The opposite tendencies of aggression stimulate and block each other. In today's society, the free expression of anger is prohibited, and absolute control of all hostile impulses is demanded; and these are not externalized, but are internalized in the vascular system.

Daniels et al, understand that hypertensive patients tend to mobilize a continuous and excessive amount of anxiety and anger in response to the basic frustrations of dependence and need for security [36]. Anger and resentment are the main factors for the elevation of blood pressure, because psychoanalyzing four hypertensive patients obtained a complete curve (2 to 6 years of follow-up).

Other psychoanalysts confirmed these studies: Saul, Schwartz, Binger, Miles, Reiser and Wolf et al, and further concluded that hypertensive illness can be modified and even cured by psychoanalysis due to the normalization it produces in emotional reactions [23,30,37-40].

Most psychoanalysts have come to the conclusion that hypertensive patients do not have a very special personality, but that most of them have a chronic conflictive state that is incapable of resolving, does not accept their passive dependence and cannot freely express hostility. All these characteristics exist in other diseases, but the "target" organ would be the arteriolar system, which is also dependent on a genetic factor [41,42].

Krapf understands that hypertensive patients indicated lumbar sympathectomy and accepted it with submission as a definitive cause, which contributed to solving their psychological problems; considering themselves invalids, they gave themselves up with the most receptive of passivities [43]. In fact, most of the sympathetics improved more subjectively than objectively. In certain cases of catatonic schizophrenia, in which conflicts and frustrations do not appear due to the complete withdrawal from reality, blood pressure is usually normal; unlike paranoid schizophrenics, whose psychomotor agitation can cause hypertension to persist [44]. Miller studying 154 hypertensive psychopaths classified them into two types: transferred hostilities (paranoid) and introjected hostilities (depressive); In those where he managed to quell hostilities by adjusting them to reality, the pressures normalized [45].

Ayman through suggestion, improved 82% of patients with hypertonia, Stevens published an interesting case whose psychoanalytic study revealed that his hypertension was a phallic symbol of potency: with the experience and solution of these conflicts, the pressure was normalized [46-47]. Wolf and Wolff emphasized the importance of hostility that produces feelings of guilt as a cause of hypertension, because with the resolution of emotional conflicts, they were able to normalize the hypertension of their analysand [27]. Hill cites a case of hypertension persisting for 14 years, the analysis of which was revealed to be due to a traumatic accident in childhood; in the experience of this fact, there was a considerable abreaction, after which the pressure dropped abruptly and was definitively normalized, until the end of the treatment [48].

Robinson and Burch described cases of hypertension in which psychotherapy markedly improved symptoms and anxiety, but the individuals remained hypertensive. Friedman and Kasanin described two twins with consequent hypertension and emotional difficulties, with repressed aggressiveness; in two other sets of twins, in whom there were no such hostilities, there was no hypertension [19,49-50].

In conclusion, there are two causes of hypertension, one endogenous and the other exogenous. In the first, we found hypertension as a result of a neuroendocrine, renal, or arteriosclerotic disorder. Psychogenic hypertension is not synonymous with neurogenic; the first is due to emotional conflicts and the second can be exclusively caused by organic disorder.

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In memoriam: Luiz Miller de Paiva.

Conflict of Interest
None.

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