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ON THE STIMULATION OF CALCIUM RECEPTORS IN VENOUS BLOOD BY MEANS OF THE ACCELERATED INJECTION OF CALCIUM CHLORIDE

Abstract: The article brings to light the key role of calcium in regulating intracellular processes and the advantage of the fast injection of a 10%-calcium chloride solution in a patient's body in the lying position.

Keywords: calcium chloride, designed technique, the speed of injecting the drug, ioncalciumtherapy.

The level of calcium chloride in blood is distinguished by exceptional stability in all physiological periods, which is about 10 mg per 100 ml. It is one of the most advanced physiological constants of a human body. Its daily fluctuations do not exceed 3%. This is exactly the level that is necessary for proper functioning of nervous and muscular systems, the process of blood coagulation and the maintenance of cell membrane permeability.

One of the first illustrative evidence of the physiological role of calcium ions was classic experiments by an English physiologist S. Ringer conducted in 1883 with the incubation of different tissues under in vitro conditions. It was found that without calcium ions in an incubation medium a cardiac muscle is not capable to contract and various tissues lose their value and disintegrate into separate cellular elements. Thus, this early research has revealed two significant functions of calcium ions, which are the provision of muscular contraction and the formation of cellular contacts (cellular adhesion). 130 years ago S. Ringer, an English physiologist, told doctors that calcium ions are the most important chemical element in a human body [1].

Admitting the special physiological role of calcium in a body brings up a question: why is it calcium that nature has somehow chosen as a universal regulator? The important thing is that calcium as a

chemical element can be regulated in different biochemical ways and in the first place due to its ability to fixation by the whole range of organic polymers – proteins, carbohydrates and lipids.

The major role of calcium in regulating intracellular processes is based on the fact that the concentration of calcium ions in a dormant cell is extremely low – only 10^{-7} M, which is 10,000 times less than in an extracellular environment. Against this background even its slight increase is perceived by a cell as a physiological signal. A cell activates under the influence of a chemical or physical stimulus when concentration of calcium ions in cytoplasm becomes 10–50 times higher on account of the outer or inner source, which triggers rapid changes in the condition of the cell during which kinetic and secretory activities intensify. The system of intracellular regulation of Ca can function only in case the cell disposes of effective mechanisms for the maintenance of low concentration of calcium within the cell and a huge electrochemical gradient in plasma membranes. The maintenance of low concentration of calcium ions in a cell (10^{-7} M) within the medium with high calcium concentration (10^{-2} – 10^{-3} M) is provided by special biochemical mechanisms.

The development of a modern nervism doctrine has acknowledged the integrity of body function,

which means that an infinite chain of nerve receptors penetrating all organs and tissues deflects the operation of all outside and inside stimuli on itself and transforms them into the process of nervous stimulation that is conveyed to active organs changing their morphological and functional state. That is to say, it forms health or disease depending on an organic or inorganic stimulus.

In 1930 a Russian physiologist I. P. Pavlov in his article “Conditioned Reflexes or Temporal Relationship” in the research on the decay of nervous impulses puts a question: why do synaptic vesicles with a mediator suddenly stop flowing out into a synaptic gap? It appears to happen through the lack of calcium ions in a nerve terminal. In the absence of calcium ions synaptic vesicles lose the ability to cling to the membrane of a nerve filament in those places where they can seep outside [2].

Why does a nervous impulse enable synaptic vesicles to stick to the membrane of a nerve filament? The authors of the so called “calcium hypothesis” E. A. Liberman and his collaborators have answered this question. They used a plain physical fact. We need to increase the surfaced electric charge of a membrane for vesicles to cling to it. It is performed only by calcium ions (a solution deprived of calcium cannot carry out a synaptic impulse transmission).

In 1957 Kiev scientists retried the experiment of the English physiologist S. Ringer but on a nerve cell. Calcium is one of essential components for the vital activity of a neuron. The treatment of a nerve cell with a non-calcium solution leads to the appearance of numerous ultramicroscopic openings in its membrane. As a result, it turns into a fine sieve which easily sifts out minute ions of sodium, potassium, calcium, chlorine and others and is not capable to perform the functions of a nerve cell [3].

A German chemist Otto Warburg devoted 24 years of his life to studying the nature of such a horrible disease as cancer and in 1932 he was awarded the Nobel Peace prize in chemistry for establishing the fact that the process of carcinogenesis is anaerobic.

In 1967 a German chemist Otto Warburg in collaboration with an American doctor Carl Rich worked on the research into the opportunity to prevent cancer with the aid of calcium (exactly calcium!). He established that it was calcium that could cure cancer! Having carried out the CBC Chem-2 tests on terminally ill patients (stage 3 and 4 cancer) they ascertained that all of them experienced a significant lack of oxygen environment.

1967 witnessed the discovery of calcium pores in teeth through which calcium ions initially get into the body at chewing food.

The latest scientific research has shown that calcium is a vital microelement in a human body. Its deficiency causes about 150 diseases! That is why even taking calcium prophylactically can considerably decrease the risk of diseases.

In order to provide a rationale for a fast way of intravenous injection of a 10%-calcium chloride solution in a patient's lying position we will turn to some elements of fluid mechanics, blood in particular, namely to the continuity equation in its flow, the principle of communicating vessels, that is, Bernoulli's equation. In accordance with the condition of the continuity of fluid flow the speed of blood motion in vessels is inversely proportional to their cross section, i.e. $v_1 d_1 = v_2 d_2$, where v is the velocity of a fluid and d is the diameter of a vessel. Therefore, a wave spreading the action of calcium ions in the body corresponds to the wave of changes in the cross section of blood vessels and the speed of blood flow through them.

The pressure, produced by blood flow on the walls of arterial and venous vessels, causing the effect of “a calcium stroke”, is determined according to Bernoulli's equation by gravity. Actually, Bernoulli's equation is written as $\rho v^2 + \rho gh + P = \text{const}$, where ρ is fluid density, g is free-fall acceleration, h is relative height above the horizontal level of the marked positions of a plane starting with a head, a plane above the pelvis level, knees and feet. P is pressure which varies with the change of velocity – v due to the change in the cross section – d [4].

At the intravenous injection of calcium chloride in a sitting position we have two types of the reaction of vessels to this influence – through arterial and venous vessels in different body positions: 1 – vertical big – from a head to a pelvis, 2 – horizontal – from a pelvis to knees and 3 – a short vertical segment – from knees to feet. According to this, we have three flows of blood motion depending on the phases of contraction or relaxation of nonstriated muscles in arteries and veins which are influenced by the gravitational force $F = pg$ directed downwards.

Arterial – a) from heart to brain – blood gets into brain at the synchronized contraction of nonstriated muscles of arteries. The gravitational force $F = pg$ counteracts this process. If calcium ions are conducive to the contraction of nonstriated muscles of arteries, it facilitates blood progression through vessels improving brain irrigation. At the relaxation of the nonstriated muscles of veins the “vacuum” effect of blood getting from veins into arteries intensifies; b) from heart to lungs blood comes by a lesser circulation and a systematic circulation it comes to abdominal cavity organs and the lower limbs. With the improvement of contraction of nonstriated muscles under the influence of calcium ions, the blood flow in arteries grows and it is additionally determined by gravitational force $F = pg$ directed downwards, coinciding with the movement of blood current.

As far as arteries and veins are concerned, the dissemination of a hot wave goes synchronically with nervous impulses to nonstriated muscles and with their contraction and relaxation so the propagation velocity of a hot wave is high.

Venous flow has three levels: a) vertical downward from head to heart: under the influence of calcium ions at the contraction and relaxation of nonstriated muscles in the capillaries and veins of brain there happens an accelerated outflow of blood on account of the gravitational force $F = pg$ directed downwards with the blood current from brain to heart; b) vertical short: from the veins of upper limbs. It gathers venous blood from the veins of upper limbs

under the influence of negative pressure at the period of heart diastole, being counteracted by the gravitational force $F = pg$. During the observation of patients and their interviews it has been noted that a lot of patients had heaviness in the upper limbs and in the pectoral region; c) vertical long – the most difficult one: from the veins of lower limbs, a pelvis, an abdominal cavity up a vena cava to the heart where a large blood volume is counteracted by the force of free fall, the gravitational force $F = pg$ directed downwards. Almost all the patients who were given “hot injections” noticed that right after the injection of the drug they experienced such a sensation in the inguinal region as if after urinating, and their legs filled with heaviness. The distribution of blood flow at all levels is different and the relaxation of nonstriated muscles is determined by an undulatory thermal reaction which begins in the region of head or of the abdomen and finishes in the lower limbs. At the injection of calcium chloride in a sitting position blood from the relaxed veins of a head flows out in an accelerated way causing the phenomenon of a “waterfall effect”. Since the relaxation and contraction of nonstriated muscles goes from the top downwards in an undulating manner, the arterial flow is a bit slowed down because of the force of gravity and the venous flow is accelerated. All this causes a short-term ischemic disorder of blood circulation in brain. Most of the patients experience dizziness, sickness or a syncopal state in this case.

The outflow of venous blood from the lower limbs is decelerated because of the increased blood volume and retroaction to the force of gravity, which explains the symptom of “heavyweight” limbs. Observing the reactions to injected calcium chloride in a sitting position most of the interviewed patients noted an interesting detail or a symptom: the feeling of warmth begins either with the region of a mouth, a head or with the region of an abdominal brain, an abdomen; after that the symptoms of stimulation of brain develop, which are nausea, syncopal states, hyperhidrosis, sensations in urogenital organs (as if

after urinating) and necessarily heaviness in legs (the sensation of rubbery legs).

At the same time the effect of the drug depends on the technique of its injection. In the course of several years we have been developing methods for stimulating lots of systems, an immune system in particular, with the aid of special use of calcium ions. With it, there is much experimental evidence that if calcium ions are injected in a body intravenously, there takes place an increase in the resistance of the body to radical changes in stressful situations caused by catarrhal diseases and to local painful disorders entailed by stress factors and pain syndrome – traumatic and mechanical impact, local damage (burns, chemical and mechanical injuries). The discovered mechanisms reveal the therapeutic potential of calcium injected into a body according to the technique we have devised because we introduce calcium ions with the method of fast intravenous injection of the drug. Besides, the outcomes have indicated that the effectiveness of a therapeutic factor depends on the position of a patient's body during the injection of the drug. It has been noted that when injected in a horizontal body position, calcium does not cause dizziness, nausea or other side effects. That is why the order of the procedure is the following: 1) a patient's body position for the intravenous injection of the drug is only lying; 2) the observance of an intravenous infusion rate equal to 8–10 sec for 10 ml of a 10%-solution of the drug; 3) after the end of the “hot wave” the patient should stay lying for 3–5 min – we have called this method of the intravenous injection of calcium chloride “ioncalciumtherapy”.

We have found out that ioncalciumtherapy depends on the period of the drug effect in a body and is executed since the time of the residual effect of the drug (the kinetics of a thermal wave dissemination on a body), when the time is dependent on the nature of a drug effect on the body (P-flow), which is characterized by depth and intensity of exposure on the body ($J - dw$ and dt). The energy of flow is determined subjectively by the sensation of warmth going

through the body – the burning sensations of a body volume, caught by sensation, reveal themselves. The dissemination of a calcium flow in a body is not accompanied by thermal indexes measured by devices (a thermometer). That is why we call “thermal waves” in body “superequilibrium”, i.e. specific warmth is determined by nervous sensations. The very feeling of warmth is not conditioned by thermodynamic temperature. Thus, the flow and the kinetics of spread are defined as unequilibrium dissemination. Magnitude J depends on the time of the dissemination of the flow and the kinetics of its distribution, $J - dw/dt$. The definition of the nervous response of a body and the energy of the nervous response is conditioned by the type of a nervous system: a sanguine, choleric, phlegmatic or melancholic person. Ionic form is the one that enables the electrostatic forces of a material to unfold.

One of the systems used in the treatment is the method of an intravenous injection of the solution of calcium ions and the increase in speed of its introduction into a body.

When observing the reaction to calcium chloride injected in a sitting position, most of the interviewed patients noted a peculiar symptom. The sensation of the hot wave starts either with the region of head or with the region of an abdominal brain, a stomach and then the symptoms of the stimulation of brain develop, which are nausea, syncopal states, hyperhidrosis, some sensations (like after urinating) and necessarily heaviness in legs (rubbery legs). These “awfully” unpleasant objective and subjective sensations may be the reason for patients to call these procedures “hot” and quite “painful” injections. A totally opposite phenomenon is observed if we introduce calcium chloride in the lying position. Our body is situated in a horizontal plane, the effect of the relaxation of nonstriated muscles occurs along the “hot wave” that goes from the mouth and the head through the hands and the abdomen to pelvic organs and down the legs. All this is registered in one horizontal plane without changes in AP, without a

drastic change in blood velocity in the veins and arteries of brain, the veins and arteries of an abdomen, the veins and arteries of legs. The cross-section of vessels changes only on account of the relaxation and contraction of muscles in arteries and veins. That is why the objective and subjective wellbeing, the reactions of the body to the injection of calcium chloride were easily tolerated by me and all the patients who were given injections only in the lying position. Only in the **lying** position do we not impair the hydrodynamics of an organism. I believe that nature has chosen calcium ions as the carriers of an electromotive force in our body. Any even slight changes in calcium metabolism result in damage to the vital functions of the body and the emergence of reactions of adaptation which we usually call diseases.

In case of the fast injection of calcium we reach the sufficient concentration of the drug in blood

which stimulates calcium receptors properly and opens calcium channels for letting the flow of calcium ions through the body. With restoring the electronic network of the organism, we restore all metabolic processes at the cellular level in all the systems of the body. There happens neurophysiological regulation of affected adjusted processes in the body with the correction of parameters for normal physiological functions of the existence of an organism, to put it simply, the continuation of life without diseases. For 10 days of the treatment our brain computer daily “restarts” brain structures with affected physiological processes bringing the body into a normal functional status. All diseases are connected with the adaptation of a human body to developed living conditions. The body produces changes in basal metabolism on its own with the aim of the continuation of life, in order not to die.

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