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## Acupuncture – An Electrical Phenomenon

Dr. med. Karlheinz Helmbold

### 1. Introduction

In his article: "Acupuncture for everyone?", in "Deutsches Ärzteblatt" (2006;4:C157-8) designated IRNICH the acupuncture as a peripher stimulation therapy and pointed to the difficulties to show point-specific effects for certain indications in comparison with sham- or minimal acupuncture. However in the author's opinion, the acupuncture is not a peripher stimulating therapy, but a regulation therapy. His view of the acupuncture points, their importance for the normal bioelectric situation of the organism and his hypothesis of the mode of functioning of the acupuncture will be presented in this article.

### 2. The hypothesis

Acupuncture points, which normally exhibit a lower skin resistance as its surrounding, are, just like receptors, free nerve ends and other conductive structures, which are there, components of the information and energy network. This system and our regulation system, needs not necessarily to be perceived as an energy circuit in which our life energy "Qi" circulates, how it accepts the ancient Chinese acupuncture theory, but this system could also serve for the supply and for the flow of information and electrical energy out of the us surrounding air-electric field, the ambient potential, which in my view might represent the so called "cosmic energy" of the old Chinese.

As the electric current always follows the way of the slightest resistance, also this "cosmic energy" enters the body at points which exhibit the lowest skin resistance and which are concurrent with acupuncture points. I suppose that for these electro receptors the ambient potential is the adequate stimulus which triggers a receptor potential, which then runs as a forward conducted action potential from cell to cell via excitable or conductive structures and nerve tracks. After the repolarisation of the receptor the next receptor potential follows and so on. Probably also natural electromagnetic waves such as atmospheric impulse radiation enters the body at that points, and follows structures with "cable like" properties, running there and possibly leaves the body again at other points, perhaps at acupuncture points or reflex zones at the feet, which are regarded by the followers of reflexology as organ-specific.

On account the similarity of frequencies and the form of discharge between atmospheric impulse radiation and the electric impulses in the nervous system, one assumes connections between both. In addition it can be assumed that the continuous supply and the flow of this "cosmic energy" through the body are necessary for the maintenance of the normal bioelectric situation and to the conservation of our life energy and for the functioning of the organism, and that organs receive their information and energy via the nerve and functional connections with its electro receptors.

Ancient Chinese illustrations show some acupuncture meridians running in cranio-caudal direction (in a upright standing person, in vertical direction), the longest are extending from the head to the feet. FISCH (6) reported:

*"The Chinese say: Humans swim in energy like a fish in the water".*

PORKERT(22) wrote on acupuncture points:

*"According to Chinese teachings view, they represent to openings in the surface of the body, through which the Qi can pass especially easy",*

and BISCHKO(2):

*"...in special research method, acupuncture points appear histologically as cumulation of ending structures with receptor and effector characteristics."*

HEINE (7) described the morphology of acupuncture points histologically as perforations of bundles of vessel- nerve- and connective tissue-bundles of the body surface, and makes therewith a physical explanation of the electric measurement of acupuncture points possible. Therewith the relation between skin points and remote lying organs could be explained anatomically.

The following data are suitable to support the conceptions of the author: The Viennese physicist MARESCH found when his investigations of humans weather sensitivity, that in the air-electric field an adult of normal size is exposed to a tension of 200 V. He also found skin areas with especially electrical behaviour, which he called electrically excellent spots of the skin. At these points he could measure in disturbances of the air-electrical field changes of the electrical values. (18) KÜGLER (17) mentions, that the atmospheric impulse radiation, the so called atmospheric are regarded as a weather-active agent and that in the bioassay by in true-to-nature copied electromagnetic impulses a clear change of the motoric was caused and by simulation of bad weather signals a reduction in tissue respiration resulted.

KÖNIG,(16) writes over the air-electrical field among other things:

*"The electrical conductivity of the human body or a plant is largely enough, in order to reduce the electrical field within the body very strongly. Nevertheless show measurements by means of electrodes deeply within from plants and animals, that within the ULF- range [electromagnetic processes of natural origin with frequencies of under one Hertz are called lying within the ULF - range (Ultra Low Frequenzy)] the internal fields mostly in temporal phase synchronously pulsate. It is assumed that peripheral receptors take up the outside field, whereby the internal field is to be understood as a kind answer of the outside irritations. Independently of it a static or slowly variable magnetic field reaches each part of the human body" and in other place: "Electromagnetic fields can be determined in the membrane of nerve cells, and therefore it is not excluded that*

with different frequencies a direct component of the parallel electric current which is generated by the outside fields leads to a Stimulation of the cells or a change of their adressability".

Electromagnetic fields can affect the mobility of ions, involved in the process of nerve excitation. Vibrations of ions with frequencies of the externally operating field influence their ability to penetrate the nerve membranes. Therewith they steer the excitability of the nerves. Electromagnetic fields can probably also influence the so-called spontaneous activity of receptors. Possibly the external electromagnetic fields determine the internal electromagnetic regulation, which is effective in various frequency ranges. POPP and STRAUSS (21) wrote, among other things:

"Modulated electromagnetic waves mediate as biosignals communication between cells and regulate the cell growth. ( ... ) We know that there are electromagnetic waves in cells and we convinced ourselves of the fact that a fundamental biological role comes to them. RUTH could prove electromagnetic waves and especially biophotons in cells. Also other researchers found such radiates at many living systems."

### **3. Ear-acupuncture, acupuncture, acupressure, neural therapy, reflexology, reflex zone therapy, percutaneous regulation therapy**

All living cells are excitable. Prerequisite for the excitability and operability of the cell is the passive (rest) membrane potential. This is the difference of voltage which results at the cell membrane, among other things by the concentration differences of potassium and sodium ions, which exists between the cell inside and outside of the cell. For example the rest membrane potential of an unexcited nerve cell membrane amounts to 70-90 mVs, thereby the outside of the membrane is positive opposite the interior of the cell. During the nerve excitation the cell membrane becomes more permeable for certain ions than in a passive state. Now these ions can follow their concentration gradient, the sodium ions stream into the cell inside and the potassium ions outward. This very soon leads to a depolarization and a reversal of the potential difference in the action potential. After the re-establishment of the rest membrane potential, the repolarization, the cell is excitable again. This ion migrations through the cell membrane accompany all life processes, so f. i. the conduction of excitation in the nervous system, the brain activity and the transport of substances through the cell membrane etc. The cell remains however only so long excitable and functioning, as after each excitation process the repolarization follows. As long as these bioelectric processes run off normally, the continuous information flow in the nerve and regulation system is undisturbed.

According to the conceptions of the traditional Chinese medicine then the life energy "Qi" circulates regularly in the acupuncture meridians, YIN and YANG are in balance. When this balance is disturbed, it comes to disturbances of the cell functions and depending on their localization different disease pictures develop. Such cell malfunctions can appear as consequence of an oxygen deficiency, f.i. with blood circulation disturbances or as consequence of poisons, which intervene in the oxidation processes of the cells. Thus it comes according to H.ISKRAUT(13) to an extreme depolarization of the affected cell, that is, to an extraordinary voltage drop at the cell

membrane and thus the function fails with a "cathode block". Thus the cell became unexcitable.

Such a cathode block spreads from cell to cell or via nerve and functional connections and reflects itself finally at the external ears and other functionally associated skin areas (reflex zones) and skin spots (acupuncture points).

A markedly hyperalgesia develops or an away-led pain occurs there; in addition changes in electric skin resistance and potential as a sign of the available disturbances of the ion household and the homeostasis in the tissue. Such changes were proven at reflex zones and acupuncture points. The nervous system of humans is a functional unit, in which the loss of a subrange causes always also a disturbance of the whole system. Nerve and functional connections via which the cathode block spreads towards the periphery can in reverse direction also serve for the treatment of this health trouble. One can cancel a cathode bloc in terms of "Minus and Plus cancel each other out" by artificially setting of an anode bloc in the affected spots (13). The fact that we can act therapeutic from acupuncture points and reflex zones by acupuncture, ear acupuncture, acupressure, neural therapy, reflexology, or the percutaneous regulation therapy on the disturbed organ, respectively on the there reflected disease, permits the conclusion, that all these treatments work like an anode bloc, which can cause the repolarization of extremely depolarized cells, apparently even cells which are affected by the loss of function (cathode block).

#### **4. Neural therapy**

In the case of neural therapy the repolarization of the extremely depolarized cells affected by the loss of function is effectuated by the injected local anaesthetic. It is known that local anaesthetics can influence membrane permeability and increase the membrane potential. With the local anaesthesia the membrane potential increases so far, that it could not break down any longer, the cell becomes hyperpolarized and thus unexcitable (anode block). Thus it falls out for the pain line. According to DOSCH (5) the charge of a normally polarized cell of 90 mV is increased by the injection of local anesthetic procaine to 290 mV. Thus this cell is inexcitable. After 20 minutes, the membrane potential falls back to baseline by 90 mV. The cell is polarized normal again, excitable and functional. Also, the membrane potential of a cell in a constant of 10 mV depolarized interference field is by such an injection initially hyperpolarized to 290 mV (local anaesthesia) and normalizes then after 20 minutes to 90 mV. In this way also the "Second phenomenon" HUNEKES (12) becomes true.

#### **5. Acupuncture**

With the acupuncture the repolarization of extremely depolarized cells, affected by the loss of function, is caused by the electric current, which develops with the puncture of the needle into the body, probably in addition, by the electric current, which is supplied from the us surrounding air-electrical field, from the ambient potential, by way of the needle. This leading connection exists during an acupuncture for several minutes, with so-called 'permanent needles' even over days. According to WOLFF(23) develops with the puncture

of the needle in the body always an electrical potential respectively a micro current, which is measurable and apparently able to increase the membrane potential even of extremely depolarized cells till to their repolarization. This normalization then spreads probably from cell to cell or by functional and neural connections, or by the intercellular substance, the system of the "Grundregulation" according to PISCHINGER (19) from the skin to the disturbed organ, so that ideally also its malfunction is corrected. The superiority of the acupuncture of traditional points opposite needle punctures into non acupuncture points could explain itself by the fact that between the traditional points and the disturbed organ respectively the organ, which should be treated, nerve and functional connections exist, which are especially conductive, while the "wrong points" do not have such good connections to the disturbed organ. Therefore they could not be directly reached by the electric current, which is supplied by the acupuncture needle ("acupuncture current"), but possibly only after a detour via the intercellular substance, the system of the "Grundregulation" according to PISCHINGER (19). [According to HEINE (7) one understands by it a network of high-polymer sugar protein complexes, which like a molecular sieve traverses the entire extracellular area.

By the intercellular substance informations can be passed on very fast from cell to cell. Changes of charge are transported for example over "information bridges" made of water and sugar polymers. HEINE described the morphology of acupuncture points histologically as perforations of bundles of vessel- nerve- and connective tissue-bundles of the superficial "body fascia", and makes therewith a physical explanation for the electric measurement of the acupuncture points possible. Therewith the relation between skin points and remote lying organs could be anatomically explained.]

## 6. Acupressure, reflexology

The Akupressur and the reflexology of the feet probably cause the repolarization of the cells affected by the loss of function due to extreme depolarization by a provoking of the pressure receptors or with pressure on the nerve membrane:

*"A sufficient fast deformation of the nerve membrane by local pressure leads to an away-led action potential" KEIDEL W.D. (14).*

The "Percutaneous regulation therapy by normalizing of disturbed body potentials and cell functions over acupuncture points and reflex zones" abbreviated: PR, according to HELMBOLD, K. (11), bases on theories and experiences of ear acupuncture, acupuncture, neural therapy and reflexology and acts similar to the acupuncture, but with the application of pharmaceutical preparations, which are apparently able to increase the membrane potential even of extremely depolarized cells, when they are applied to the disturbed acupuncture points and reflex zones (painful or hyperalgetic skin points and skin zones); indexed acupuncture points can also be treated) and always the external ears, which apparently acts due their innervation as reflex zones for the whole organism (the vagus nerve, the trigeminal nerve and the cervical plexus, between which connections exist). When an acupuncture needle puncture into the body, then develops a micro-current that is measurable and apparently able to increase the membrane potential of depolarized cells, till to their repolarization and to an ion exchange through the cell

membranes and thus to the normalization of the disturbed cell function. This normalization then spreads, probably, as already described above, from the skin to the disturbed organ, so that ideally also its disfunction is corrected. With the PR could be achieved in suitable cases similar successes as with the ear acupuncture, the acupuncture or the neural therapy, but without pain and without the risk of dangerous side effects. Treatment trials showed that this is also possible with ointments, which contains as active substances only salts respectively their ions, which are necessary for the repolarization and in our body needed for the normal functioning of all life processes, that are going on with an ion exchange through the cell membrane and certain electrical phenomena.

These trials led to the "Jonen-Salbe" and the "Jonen-Salbe 3,5 g," both ion ointments contains as active substances calcium chloride, potassium chloride and sodium chloride, respectively its ions. Sometimes stepped the PR a rapid improvement with Lumbago and other painful malfunctions of the movement apparatus, with hay fever and functional diseases, also with MS-patients with spastic paralyse (only to the mitigation of the spastic), here is to that a case example: My patient, 54 years old, suffered from multiple sclerosis with spastic tetraparesis and decubital ulcers at both inner ankles. For the relief of his spasticity he needed 4 times daily 25 mg Lioresal. By applying the "Jonen-Salbe" on the outer ears disappeared the spasticity within a few minutes for hours. [Such rapid success has been designated as "minute phenomenon" (9) analogous to the "second phenomenon" according to HUNEKE because in both ultimately happens apparently the same, only different rates.] This success was reproducible. The patient used during the last 3 years of his life for the relief of his spasticity only this ointment 2 times daily on the outer ears. (Sorry I could not reach a clinical review with similar cases. Therefore: if anywhere such treatment trials should be made, I would be very grateful for the release of these experiences helmbold - sw@t-online.de www.jonen-salbe.de).

The PR with ion ointments causes the normalization of the disturbed cell function apparently by the contained salt ions. Ions are small electrically charged particles, in which f. i. salts disintegrates, when dissolved in water. Of the sodium ions reported H. ISKRAUT (13) already 1954:

*"They set up the membrane potential like local anesthetics without that there an anesthesia must occur."*

and:

*"Even with lack of sodium ions, the nerve loses its excitability, without the necessity that the membrane potential change significantly. Intake of sodium ions raises this state again."*

Therefore, it is incomprehensible, that physiological saline solution continues - more than 5 decades (!) - has been considered as "drug free" and used as a placebo and may be still used till today. One should, check all studies, which were made with NaCl as placebo, and then correct it accordingly. In cases where the alleged placebo has shown to be particularly effective, one should clarify, whether it in such cases can be with used as a therapeutic agent. But now to the mode of function of the ion ointments: apparently formed by the application of these ion-ointments by the contained ions at the depolarized cell membrane a concentration gradient or an electro-chemical potential gradient, which increases the membrane potential till to the repolarization of the depolarized cells and to

the ion exchange through the cell membrane and thus to the normalization of the cell function. That membrane potentials are caused by concentration differences of sodium and potassium ions is natural-scientifically understandable. Therefore speak the with the PR with ion ointments achieved successes, in my view, not only for the effectivity of this therapy but also for the correctness to the hypothesis: Acupuncture - an electrical phenomenon. The ancient Chinese recommendation, during a thunderstorm not to acupuncture, suggests, that this also the ancient Chinese had already recognized.

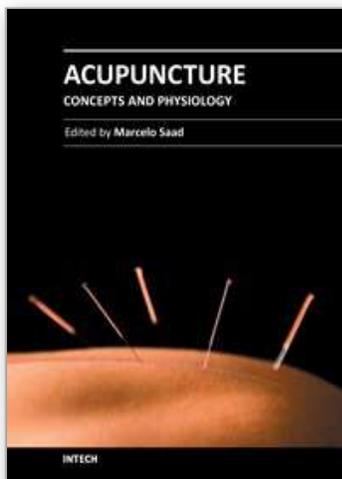
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Acupuncture and related techniques are useful tools for treating a spectrum of diseases. However, there are still many areas of controversy surrounding it. We hope this book can contribute to guide the advance of this ancient medical art. In the present work, the reader will find texts written by authors from different parts of the world. The chapters cover strategic areas to collaborate with the consolidation of the knowledge in acupuncture. The book doesn't intend to solve all the questions regarding this issue but the main objective is to share elements to make acupuncture more and better understood at health systems worldwide.

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