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Editorial

Dear readers,

I write this editorial when our holiday season reaches its peak. Some of you had your holiday already, others look forward to a holiday and again some of you – and I hope many of you – are in between two holidays (I don't mean Easter and Christmas here).

The word "holidays" in Slovak language implies an attitude of affording. We hopefully afford something that we don't do every day. There is a time in the flood of duties ensuring our existential needs when we may afford something good. Afford to breathe and to concentrate to our own breathing. Afford to experience and enjoy what happens with us in here and now. Afford to switch off the "autopilot" of ensuring and organizing, even if just for a while. Afford to read in a free time. Afford to have some free time.

Therefore, dear readers, I invite and ask you to afford.

If you decided to allow yourselves some intellectual feeds in form of the e-magazine "Acupuncture and Natural Medicine" I can – without any aspiration of influencing – ensure you that this time will not be spent senselessly. Also in the current double issue that represents the second part of the compendium of lectures presented on the XX Interdisciplinary Medical Congress of Natural Medicine with international participation in Sturovo, Slovakia there are interesting and high quality papers waiting for your attention.

G. Solár, M. D., PhD., in his article on "The Pyramid Model in Acupuncture and Chakra – Introduction to the Issue" describes the correlations between the pyramid model that we know from acupuncture and the most known chakras in the body. As we can see from the title the work represents an introduction to the issue encouraging further interest.

In her work "Elements in Acupuncture" Z. Solárova, M. P., PhD., explores the arrangement of primary elements in the pyramid model, in the model of an eye within the pyramid and the functioning of sequence principles according to Tibetan as well as traditional Chinese medicine.

Prof. E. R. Muldashev, M. D., DrSc., and collective offer in their article "Alloplant Biomaterials Reflected in Natural Medicine" an overview of historical milestones in the development of transplantology leading to a better understanding of inclusion of Alloplant biomaterials usage as a part of natural medicine.

J. I. Koryukalov, PhD, candidate for biological sciences investigated in his research together with physiotharepist V. S. Denisenko the affectivity of using an innovative orthopaedic medical aid "Cordus". Their results that are an inspiration for natural medicine open new possibilities for treating and preventing vertebrogenic pain and its syndromes. This article is peer-reviewed and not a part of the compendium.

Paper by MUDr. T. Mochnáč, PhD., on "The Acupuncture on Basis of IFI DES-M-Info-interactional Diagnostic of Elements – M inter-connects old knowledge used in acupuncture and an aspiration to describe some of the relations and processes occurring between elements within the energo-information system. The work represents another piece of a mosaic in understanding the functioning that occurs in constant dynamic process, where something (experienced) previous continues to something (predictably) following.

Assoc. Prof. J. Slobodníkova, M. D., CSc., h. Prof., offers in her article "Endogenous Oestrogen as a Possible Risk Factor for Brest Carcinoma Genesis" an interesting and comprehensive explanation of the breast carcinoma genesis mechanism under the influence of higher oestrogen levels in post-menopausal women.

R. F. Galiakhmetov, M. D., CSc., studies in his work "Conceptual Model of Regenerative Medicine Based on Alloplant Biomaterials" effects of pharmaco-puncture in comparison with classical treatment of damaged areas with Alloplant.

I wish that in this period of the year you afford as most as you can and I wish you very pleasant and meaningful reading.

■ Eva Baumann, M. D.
Associate Editor Responsible for Interdisciplinary Studies

Scientific Council

The Pyramid Model in Acupuncture and Chakras – Introduction to the Issue

Solár, G.

Summary

The author continues in the elaboration of a pyramid model in acupuncture to include chakras. He sees them as a comprehensive mutually interconnected energy-information system of a higher order in which all twelve organ meridians come together in a communication network. The system of chakras has its own energy-information, psycho-regulative, somatic and spiritual characteristics and also demonstrates the degree of the actual development of the organism.[2] Chakra is a higher centre integrating the horizontal and vertical planes of the energy-information system.[8] The horizontal plane determines the characteristics of internal dynamics, whereas the vertical plane determines development and communication characteristics.

Keywords

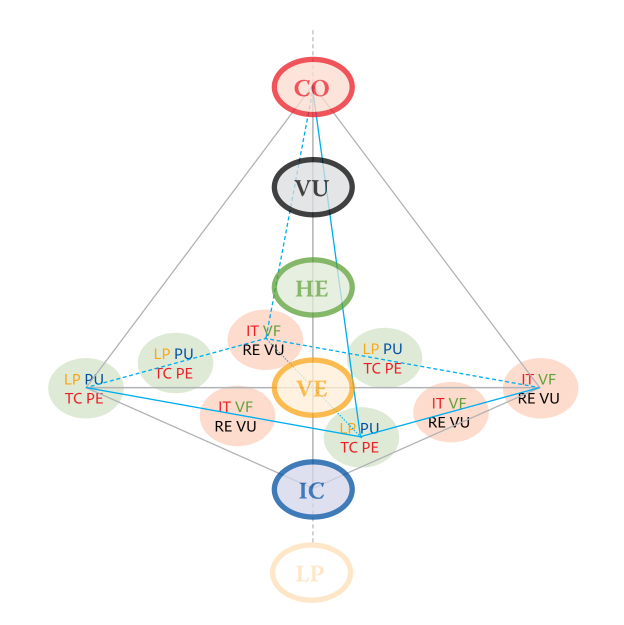
Pyramid model in acupuncture, chakras, vertical yang concatenation, horizontal yang concatenation, horizontal yin concatenation, vertical yin concatenation

Introduction

The pyramid model in acupuncture (Fig. 1) is characterized as a model of the comprehensive universal dynamic and spatial arrangement of energy-information networks.[4] The model itself (a pyramid) is, at the same time, a fully functional and dynamic system. The layout of the elements, based on the pyramid, and their dynamics correspond with the arrangement in the so-called magic square (Fig. 2). The position of the individual elements on the basis of the pyramid does not change, irrespective as to whether it is bagua Fu-Shi, Wen, S1 or S2 type (Fig. 3). The individual axes of the horizontal level (base) of the pyramid form FIRE-WATER, WOOD – METAL, METAL – WOOD, and EARTH – EARTH element pairs. The so-called "transition" elements WOOD and METAL, representing transitions between the most yang element, which is FIRE, and the most yin element, which is WATER, have two axes – WOOD – METAL and EARTH – EARTH. In individual bagua the positions of the individual meridians change in such a way that all eight meridians of the horizontal plane switch in all elements. The pyramid model confirms that every meridian contains parts of all elements, which is expressed in Traditional Chinese Medicine (TCM) by antic points in every meridian, while the notion of an "element" is the dynamic resultant status of rotations and other characteristics of meridian arrangements. The dynamics of meridians of the horizontal plane are formed of bagua Fu-Shi, Wen, S1, S2 and transitional SX, in which the comprehensive meridians are integrated.[7] This dynamic creates both yang and yin concatenation of the horizontal plane. There are four individual bagua axes; in bagua Fu-Shi it is the FIRE – WATER axis, in bagua WEN it is the METAL – WOOD axis, in bagua S1 it is the EARTH – EARTH axis and in bagua S2 it is the WOOD – METAL axis. The most stable is the VU-PU axis, being the only one present in all four bagua and representing the time-space axis, and it is always perpendicular to the bagua type axis (Fig. 3). The vertical axis of the pyramid model is in the original arrangement represented by the IC, VE, HE, VU and CO meridians and representing all five elements.[6] The pyramid model published until now models all the meridians and elements known from acupuncture and partially proven symmetry-logically.[4][5][9][10]

Gustáv Solár, M. D., PhD
The First Clinic of Acupuncture and Natural Medicine, Ltd., Šamorín, Slovak Republic

Fig. 1. Pyramid model



However, the energy-information system also contains a higher order system known as the system of chakras. The term chakra stems from Sanskrit (चक्र); in Hindi it means a wheel, a disc. It is a comprehensive energy-information system of a higher order in which all meridians come together from a communication perspective, which has its own energo-information, psycho-regulative, somatic and spiritual characteristics, and expresses the degree of the actual development of the organism.[2] The aim of the study was to investigate whether the pyramid model of acupuncture, or the energy-information system, also contains and reflects the system of chakras.

Fig. 2. Elements layout in the pyramid according to the 9th palaces

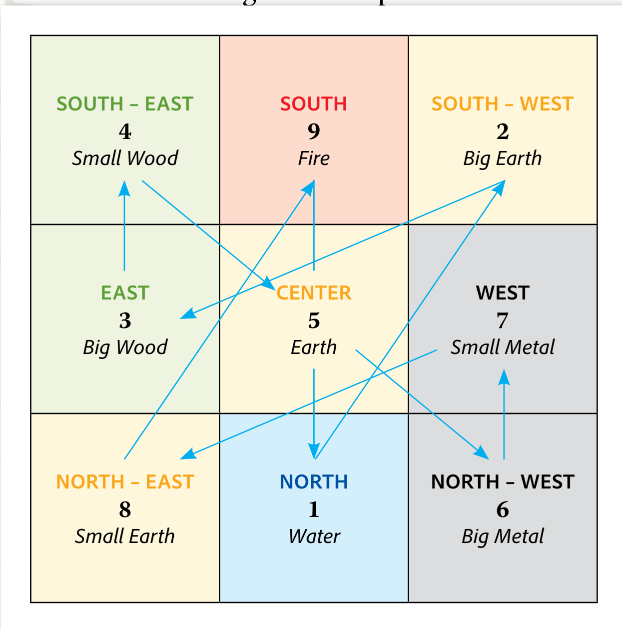
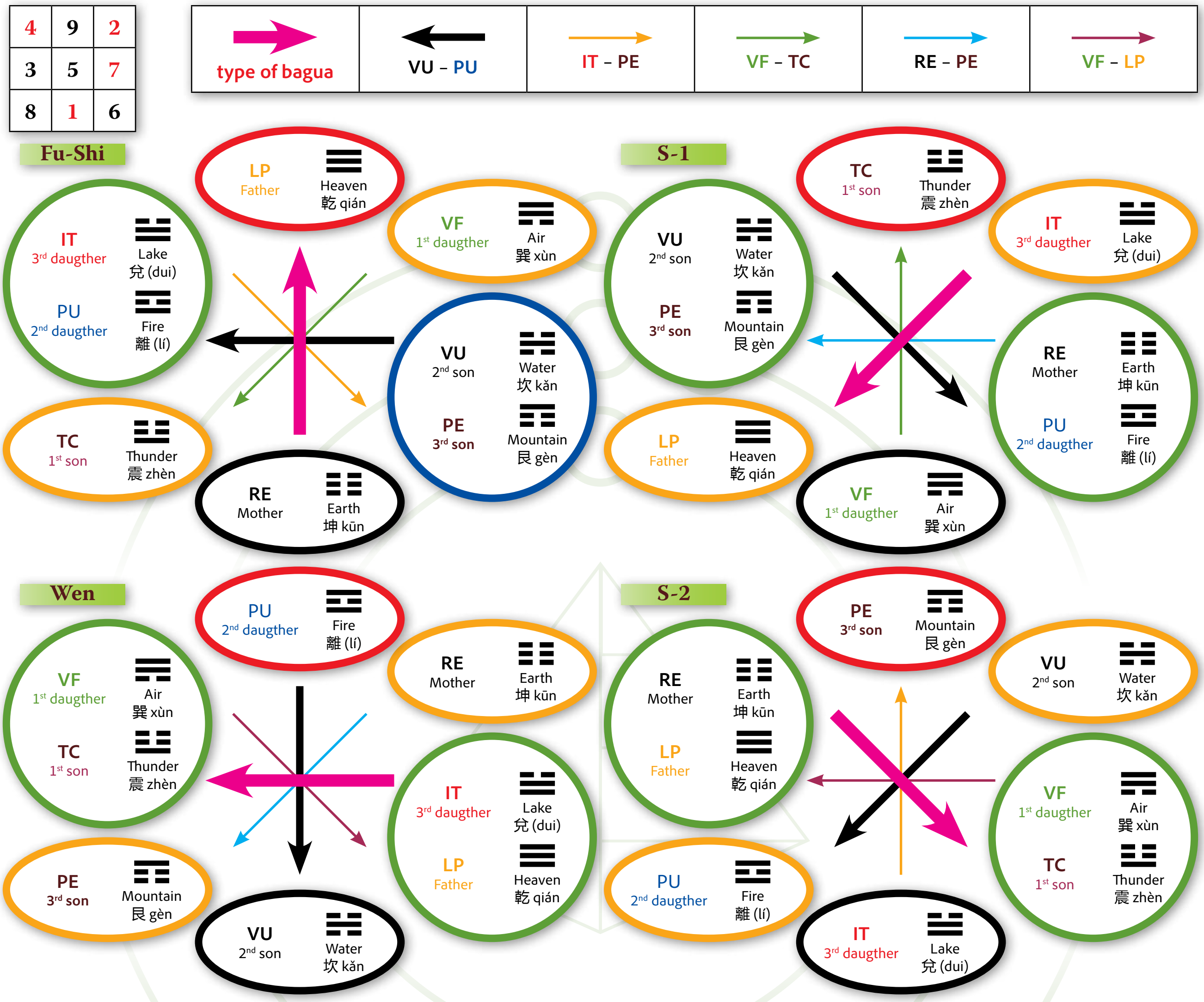


Fig. 3. The position of the individual elements by the bagua type on the pyramid base



Materials and methods

We analysed both vertical and horizontal planes of the pyramid system and their mutual relations in accordance with previous knowledge on both of those planes. Since the system of chakras is in its substance primarily vertical, we mainly focused on the relations and links of the vertical plane of the pyramid system. Since we see chakras as a comprehensive energy-information system of a higher order, it was necessary to analyse comprehensive relations and links of the entire system of energy-information networks with chakras, too.

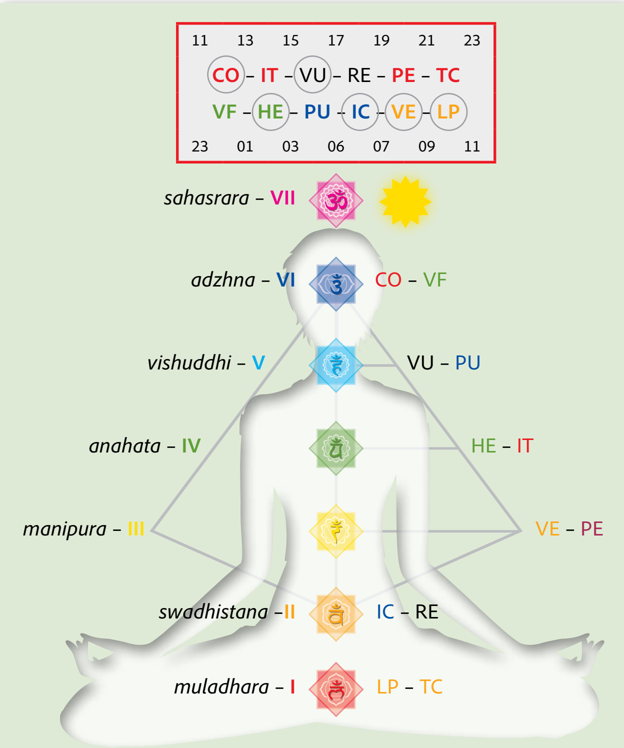
Results

The spatial base of the pyramid model is formed by two mutually perpendicular planes – horizontal and vertical. They together contain all organ meridians, including comprehensive meridians in TCM named as extraordinary or “miraculous”. Such a spatial arrangement implicitly contains bagua according to Fu-Shi, Wen, S1 and S2, which means all four basic ones, and also bagua SX.[8]

Chakra is characterized as a comprehensive energy-information system of a higher order in which all meridians come together in a communication network. This system has its own energy-information, psycho-regulative, somatic and spiritual characteristics, and is also a manifestation of the degree of the actual development of the organism. Every chakra is a mutually integrating component of both vertical and horizontal planes.

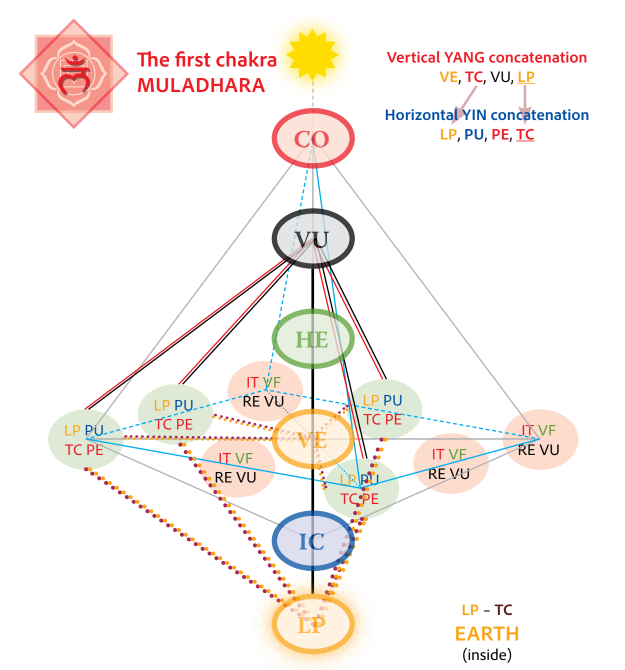
The system of chakras is predominantly vertical and their arrangement primarily corresponds with the arrangement of the vertical plane of the pyramid model (Fig. 4).

Fig. 4. Pairs of chakra meridians and their arrangement by circadian rhythm



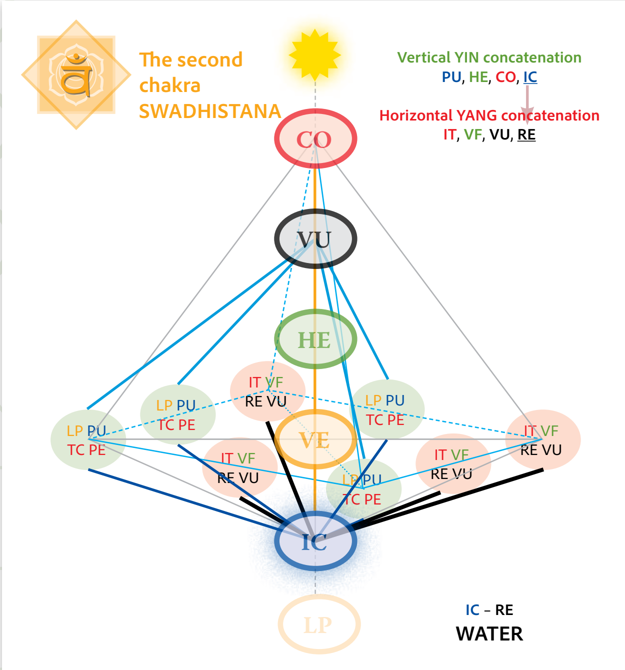
The First Chakra – *muladhara* – (Fig. 5) is a basic chakra and in the pyramid model it is infra-pyramidal, which means it is under the lowest point of the pyramid itself. It creates a core from which the whole pyramid develops. It is, in fact, the "onset" of the pyramid. At the material and energy-information levels, it represents the primarily energetic pulse and further dynamics of the entire subsequent creation. At the psychological level, it represents the first awareness of own existence – I AM.[4] It is the first degree of the actual development of the organism. Here the vertical YANG concatenation links with the horizontal YIN concatenation. In the geological structure of the planet Earth, it is located in the core, creating 31 % of the mass of the Planet and representing an earth fire – resplendence. It is the moment when the basis of the very core of the Planet which is still not the full-fledged EARTH, is created, and the chakra virtually represents the first link between EARTH and SPACE (the Father-Mother principle). Chakra is not a direct part but only a base for the body of the pyramid structure. Its meridian pair is not a link between the vertical and horizontal axes, since both meridians are originally part of the horizontal plane of the pyramid, determining only the characteristics of the internal dynamics of the processes rather than the development characteristics (of the vertical plane). Anatomically and functionally, it creates the absolute primary base of the vertical axis, and is projected in the lowest part of the trunk – on the perineum. From the perspective of the "anatomy" of acupuncture, it is located inside the space with the centre at points TM-1 and JM-1. It is the only chakra that opens downward. *(Note: just like the seventh chakra, which is supra-pyramidal and is not part of the own pyramid structure and opens upward.)* The other chakras – which are part of the pyramid structure – open forward in a horizontal direction. At the spiritual level, it expresses the descent of an energy equivalent of the Father Creator (meridian **LP** energy, EARTH) which descends down to the core (substance) of the EARTH it creates. The base of the vertical plane of the model and the process of verticalisation of the development arise here. It gives dynamics to the rise of it (meridian **TC** – dynamics FIRE resplendence) via three heaters and a material – the physical will to be like its own counter pole of the spiritual will residing in the seventh chakra. It is the primary link between EARTH and SPACE, which means the fundamental link between matter and the spirit (at the spiritual level). Suprarenal is the dominating endocrine equivalent.

Fig. 5. *Muladhara* in the pyramid model



The Second Chakra – *swadhistana* – (Fig. 6) is on the "underground" – the bottom apex of the pyramid and is part of the body of the pyramid in which all its chakras open forward. In the acupuncture anatomy, it is located inside the space with a centre at points TM-3 and JM-3. In the geological structure of the planet Earth, it symbolizes the Earth's mantle, i. e. the Core Shell, the layer of rock that forms as much as 69 per cent of the mass and 80 per cent of the volume, and together they form the material substance of the Planet enabling its creation. The lowest part of the pyramid is under the control of the element **WATER** – the most material substance. At the spiritual level, the potentials of the Father-Creator (energy substrate) and the Mother-Procreator (material substrate) cross and "procreate" their own pyramid. The Mother's function lies at the energy-information and material levels in meridian **RE** at the location of the essential energy, chi. This is also the first meridian's interconnection between the horizontal plane (RE) and vertical plane (IC) where the vertical YIN concatenation connects with the horizontal YANG concatenation. At the psychological level, it is the first relationship between I and YOU, i. e. the second degree of the actual development of the organism (relationships, sexuality, procreation, creativity, self-esteem in human relations). At the vertical level, **IC** represents a washing away of negative (self-destructive) emotions from such relations in order to prepare the level for the reception of further new experience, and, thus, the growth and verticalization, i. e. development. The ovaries or the prostate are the dominating endocrine equivalents.

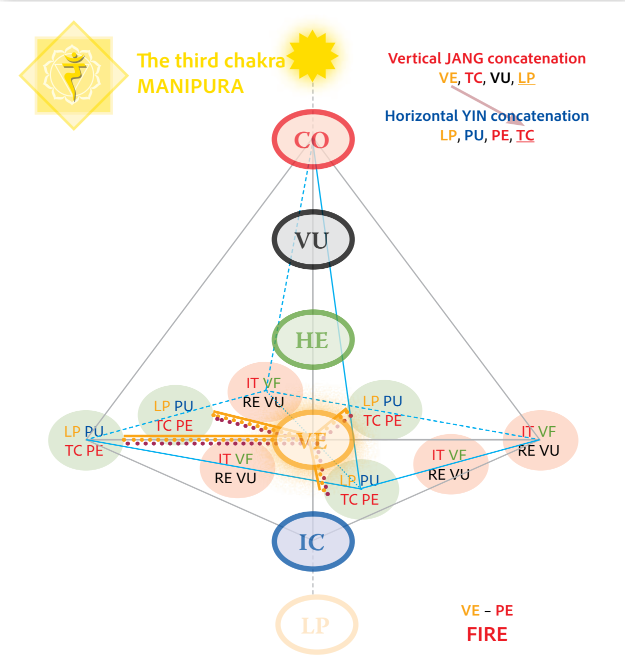
Fig. 6. *Swadhistana* in the pyramid model



The Third Chakra – *manipura* – (Fig. 7) is at the level of the base of the pyramid body. In the geological structure of the planet EARTH, it is at the level of the Earth's crust, i. e. the topmost geological layer of the Earth. Here is the lithosphere – the rigid layer of the Earth's surface, but divided into floating lithospheric plates. The base of the pyramid represents **stability.** At the psycho-regulative level, it is the area attracting external emotions from the surroundings, as well as being the seat of one's emotions. Here the process connected with the fulfilment of material needs of a personality is capped. At the psycho-regulative level, it represents, first of all, a need for acceptation and self-respect. Its ventrodorsal location is centralized at points JM-8 and TM-4. The chakra is under the control of the element **FIRE,** a meridian pair linking horizontal and vertical planes form the meridians **VE** and **PE**, which means it is rather an earth FIRE from the core of the EARTH. A lack of stability is manifested by negative emotions, such as anger, regret, a feeling of uselessness and feelings of guilt.

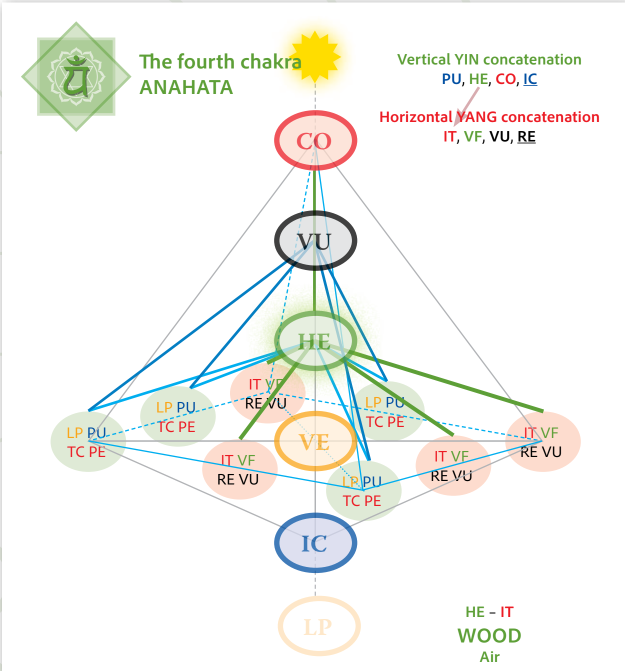
In this chakra, the vertical YANG concatenation links with the horizontal YIN concatenation. The dominant endocrine equivalent is the pancreas.

Fig. 7. *Manipura* in the pyramid model



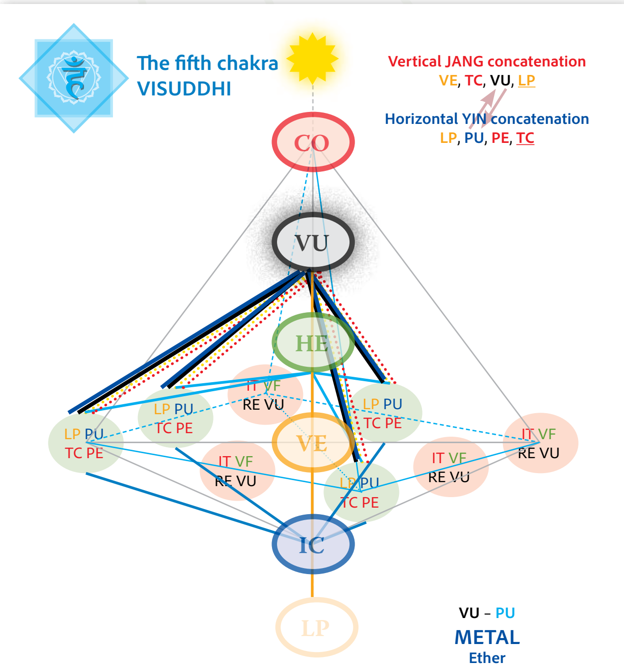
The Fourth Chakra – *anahata* – (Fig. 8) is on the interface of the first and third thirds of the vertical axis going through the centre of the pyramid base at the location of the so-called "pharaoh's chamber" in the pyramid, in its "energy centre". In the body, it is located ventrodorsally and centralized at points JM-17 and TM-10. In analogy to the structure of the Planet, it corresponds with the Earth's lower atmosphere, i.e. troposphere and biosphere (the living mantle of the Earth) and **harmony** is the substance of this chakra. It is under the control of the element **WOOD (air)**, the movement of which is horizontal and vertical, and the meridian pair connecting both vertical and horizontal planes of the pyramid is formed by the meridians **HE** and **IT**. The HE meridian is key for metabolism and IT meridian for immunity. Both are very sensitive to disharmony in the body, and the meridian HE reacts to all emotional stimuli. This meridian pair links the vertical YIN concatenation with the horizontal YANG concatenation. *Anahata* forms a centre between the three lower, more material chakras and the three upper, more spiritual chakras, and ensures their mutual harmony. At the spiritual and psycho-regulative levels, the need to be loved and to have love for yourself is dominant. At the spiritual level, it is the relation to the Creator, at the psycho-regulative level, it is a need for self-love, which is necessary for the integrity of the personality and its relationships and, at the same time, for the need to share that love.[2] Any frustration in this respect necessarily results in disharmony of the personality at all levels, and also in metabolic and immunity disorders. Self-destructive programmes developing in this chakra in particular, as a product of negative emotions, block verticalisation already at the level of the first chakra (non-adoption of the programme of verticalisation). The thymus is its endocrine equivalent.

Fig. 8. *Anahata* in the pyramid model



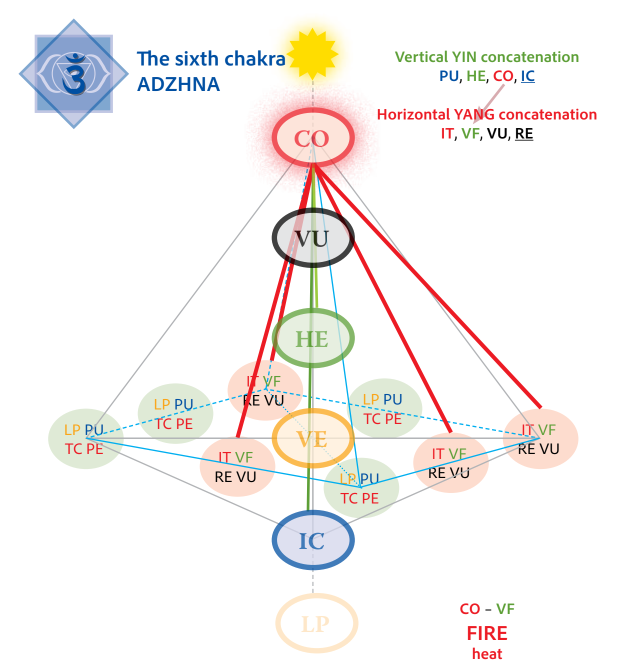
The Fifth Chakra – *vishuddhi* – (Fig. 9) is at the interface between the middle and upper thirds of the vertical axis going through the centre of the pyramid base. In the body, it is located ventrodorsally and centralized at points JM-22 and TM-14. As an analogue to the structure of the Planet, it corresponds to the Earth's stratosphere and ozonosphere, which have principal importance for the protection and manifestation of the earthly life. It protects the Planet against the destructive influences of ultraviolet radiation, and its stability is an important component of the protection and manifestation of life on the Earth. **Self-expression** and **self-manifestation** form the substance of this chakra. It is under the control of the element **METAL (ether),** and the meridian pair linking both the vertical and horizontal planes of the pyramid is formed by the meridians **VU** (of the vertical axis) and **PU.** Following the ancient Tibetans, it is here from where love and spirituality spring – the Fifth element. The meridians **VU (time)** and **PU (space)** form a single stable axis in all rotations of the horizontal plane and they also represent a time-space axis in a vertical and horizontal connection. Ether, too, is viewed as space in traditional medicine. The place where this chakra is located is a trans-dimensional space within the pyramid model, which, since it resonates with the entire Being, supports the special importance of this chakra. It links the vertical YANG concatenation and the horizontal YIN concatenation. Anatomically, it is a connection of the trunk and head which is the seat of the highest chakras. From the acupuncture perspective and in TCM understanding, it is located between the Yang and Yin buses. In terms of development and verticalisation, it represents the fifth degree. At this level takes place the communication of all the outer and inner levels, which results in self-expression and self-manifestation. G1 thyreoidea is its endocrine equivalent.

Fig. 9. *Vishuddhi* in the pyramid model



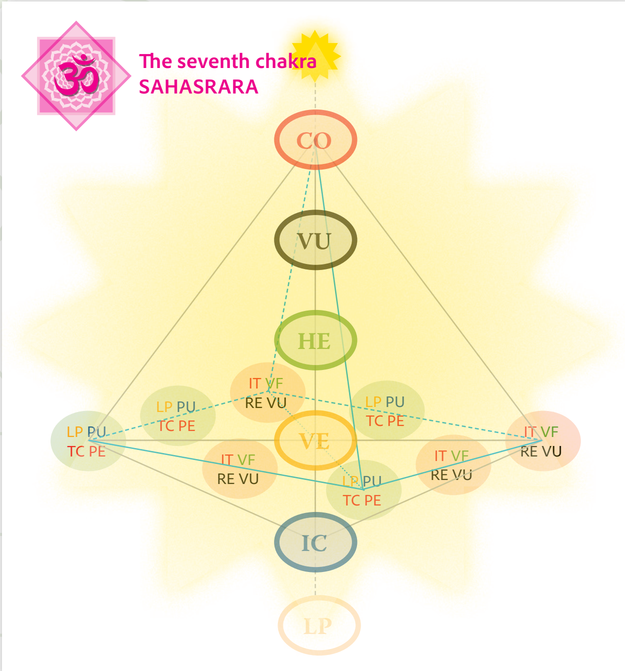
The Sixth Chakra – *adzhna* – (Fig. 10) is the chakra of the apex of the pyramid body, the highest pyramid chakra, and also the "third eye". In the body, it is ventrodorsally located and centralized at points EX-2 and TM-17. In analogy to the structure of the Planet, it corresponds to the Earth's mesosphere and lower ionosphere. This part of the pyramid model results from self-assessment and self-consciousness in **self-acceptation in the contexts.** At the spiritual level, it is the completed self-consciousness of the entity (as opposed to being conscious, at the psycho-regulative level, it is its intellectual ability to distinguish, understand and evaluate. At the biochemical-morphological level, it is the CNS control site). The chakra is under the control of the element **FIRE heat (the heavenly fire from the Sun),** and the meridian pair linking both the vertical and horizontal planes of the pyramid form the meridians **CO** (vertical axis) and **VF** (horizontal axis). The vertical YIN concatenation links with the horizontal YANG concatenation here. The CO meridian represents emotions, especially love, while the VF meridian represents penetration, i.e. the ability to penetrate the substance, and the function of the arbiter. The highest link of the spiritual, intellectual, differentiating and rational components creates a higher form of vision, perception, and evaluation – the "third eye". From the point of view of development and verticalisation, it is the sixth and penultimate grade. At this level, the own entity comes together with all levels of Creation at the highest point of the construction of the pyramid model. The hypophysis is its endocrine equivalent.

Fig. 10. *Adzhna* in the pyramid model



The Seventh Chakra – *sahasrara* – (Fig. 11) is the highest chakra and is above the pyramid's body and, therefore, from the point of view of the pyramid model, it is the "supra-pyramidal" chakra. Also in terms of planetary analogies, it goes beyond the framework of the planetary structures, enters into free space and corresponds to the so-called upper atmosphere, which is formed by the exosphere with the magnetosphere and carrying the magnetic field of the Planet. Lines of force, the so-called Van Allen belts, come from inside of the Earth (the Core), pass to distant space, and come back to the interior of the Earth, so the magnetic field carries information in both directions. This also corresponds to Tradition, which emphasizes the essence of the link between the first and seventh chakras, which are both extra-pyramidal. Anatomically, on the body the *sahasrara* is located above the head and, from the acupuncture point of view; it is in contact with the system at point TM-20, opening upward. Here, in the seventh stage, the development is complete, together with the higher I which, on the one hand, does not have material substance in the proper sense of the word but, on the other hand, implicitly contains the entire entity at all levels and goes into a higher dimension and into the "higher pyramid". According to Tradition, the fusion with Creation happens at this place. From the energy-information point of view, all levels of the energyo-information system are synchronized, while comprehensive information is optimized in contact with the higher order system. This means that all levels of the energy-information system are synchronized. The epiphysis is the endocrine equivalent that influences the circadian rhythms in the body through melatonin.

Fig. 11. *Sahasrara* in the pyramid model



Discussion

There is very little relevant literary data on the issue of acupuncture in relation to chakras.[2][3]

There is standardly described the relation of elements and chakras in thr relevant literature, but only as a repetition of the axioms of generally accepted Tradition and only in anatomical relations.[1] These are projections in Su-Jok, too, for example. Vigorous energy theses without relevant clarification of its essence *sui generis* are practically irrelevant for a more accurate study of this issue especially in the context of acupuncture and chakra.[11]

As for the pyramid model in acupuncture and its relation to chakras, there is no literary data available at all. Nevertheless, this issue needs to be addressed as chakras are an implicit part of the energy-information network and must correlate with the pyramid model. Although we find a lot of differing data concerning the number of chakras, it is undisputed that there are seven basic chakras in the true sense of the word. This is confirmed by their correlation with the pyramid model. Analogically, similarly to the pyramid model, the chakra system is fully functional and dynamic. The chakra system consists of three basic, "lower" chakras, and three "higher", upper chakras. According to Tradition, the number three represents the first complete whole. This means that the two triplets of chakras form two complete systems. The lower is more material, while the upper is more spiritual. Both systems should, under optimal conditions, be interconnected and harmonious, with the two triplets of chakras having one "extra-pyramidal". The first chakra (in the lower triplet) is "infrapyramidal" and the seventh chakra (in the upper triplet) is "suprapyramidal". One represents emergence and the other, completion. Between these triplets there is a fourth chakra which is not part of either of the two abovementioned triplets, and its main role is coordination and integration. In the pyramid model, it is located at the energetically most exposed point of the pyramid – the so-called "pharaoh's chamber". This chakra is both the generator and the coordinator of emotions, expressing the need for love – the need to be loved, and also the need to love. Its main and integrative HE and IT meridians provide harmony and immunity, and the HE meridian, especially, is highly sensitive to any emotional stimuli. It is number one, and this number symbolizes unity in Tradition. The fourth chakra contains the number four, which in Tradition is a symbol of the world order, relating to many phenomena in various cultures. Even in that, the symbolism is identical with the reality of the fourth chakra as the universally integrating TU, overlapping the symbolism with reality.

The pyramid model has two basic planes – horizontal and vertical.[8] Even though in each chakra all the meridians always link by means of triplets and other mechanisms, in particular, of the horizontal plane, the main meridian pairs of each chakra link and integrate the horizontal and vertical planes of the pyramid model. Exceptions are the extra-pyramidal chakras of *muladhara* and *sahrasrara*. While the first chakra is "born" from the horizontal plane and forms the base of the vertical plane and the entire vertical development vector, the seventh chakra integrates all the processes and represents complete information in both directions, from the organism and into the organism. In other chakras, the yang and yin meridians and the horizontal and vertical concatenations are always linked, while the meridian of the upper limb is always linked with the meridian of the lower limb and each link connects among other things the whole physical body. The symbolism of the chakras can be analysed much more closely from several aspects, mainly, for example, the endocrine, but this is not the purpose of this study. We will come back to this issue in more detail in the future.

Analogies of chakras to the structure of the Planet are currently still at the stage of inspiration for interdisciplinary studies, but they show the possibility of interconnection of energo-information networks in a spatial and universal context. In this sense, further study and research of this issue will definitely contribute to the clarification of the substance of energo-information processes. The study shows that the pyramid model might be the key factor here. It would also be in line with the substance of Tradition.

From the point of view of natural medicine, the pyramid model also enables acupuncture diagnosis and, subsequently, treatment of chakra system disorders based on the TST diagnosis. However, this issue, too, is outside the subject of the submitted study.

Conclusion

The presented study confirms that the chakra system is fully compatible with the pyramid model. This means further proof of this model and points to the possibilities of its application as a universal model of energy-information processes. On the one hand, it confirms the general axioms of Tradition, while, on the other hand, it makes them "more readable" and more graspable for research as well as for practical application in acupuncture and in the entire natural medicine, and in a broader context in modern comprehensive medicine, too.

editor reviewed

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Elements in Acupuncture

Solárová, Z.

Summary

This study focuses on the arrangement of primary elements in a pyramid, in the eye projection in a pyramid, and the functioning of principles according to Lung, La and Lo-Shu arrangement in these projections. The study is based on the Book of Changes I-Ching.

Keywords:

I-Ching, eye geometry, Bagua, meridians, elements, chakra

Introduction

The pyramid, primary elements, chakras and the eye projection through geometry all have their projections in the 8×8 table in I-Ching.

The elements in acupuncture are based on the traditional Chinese and Tibetan medicine and are well-known from various classifications in acupuncture models. The elements form mutual bonds and are largely used in diagnostics and therapy in the clinical practice. The elements are arranged in various ways – into a cross-shaped or classical circular pentagram, the pyramid model, or they are projected in an octogram called Bagua.

In the old world, the known elements called “classical” included Earth, Air, Fire and Water. The ancient cultures of the alluvial areas in various places around the world used elements with their inner and outer characteristics, i.e. archetypes, which differentiated the elements of one culture from another.

The teachings about elements were primarily preserved in Tibet, later in India. A well-known theory about five elements Wu-Xin (from China) spread to the East.[4] However, some knowledge about elements is also preserved in the teachings of Aristotle and Plato (Platonic solids). The elements occur also in the traditional architecture, e.g. the pagoda in the Chinese and Asian architecture. A good example is Buddha and his projection with five elements. The structure of pagodas reflected the theory of elements; while the tiered structure with multiple eaves symbolized the five circles (it means the five elements where the chakras are included, too).

Material and Method

In I-Ching the four primary elements Water, Wood, Metal and Fire are presented as **four symbols** standing for creatures in mythology or names of constellations in China.

In I-Ching the four symbols represent the four primary elements Water, Wood, Metal and Fire and in this form they are also known in acupuncture.[5]

The primary elements used to denote the cardinal points, seasons, the big and small **yin** and **yang**. In I-Ching the primary elements were denoted by a bigram.[8]

The elementary bigrams include

- **old yang** – **Fire,** number (9)
- **young yin** – (**Metal** or **Earth**), number (8)
- **young yang** – **Wood,** number (7)
- **old yin** – **Water,** number (6)

The Chinese tradition distinguishes the following elements: Wood, Water, Fire and Metal, and in Tibetan tradition there is Earth instead of the Metal element.[3]

The primary four elements in I-Ching represent bigrams or the binary code 0 and 1. Bigrams used to bond into trigrams and hexagrams. Trigrams in acupuncture stand for acupuncture trajectories. According to Fu-Xi and Wen, hexagrams in I-Ching form combinations of 64 elementary positions of meridian pairs, which are used e.g. by chronopuncture in everyday practice.[5]

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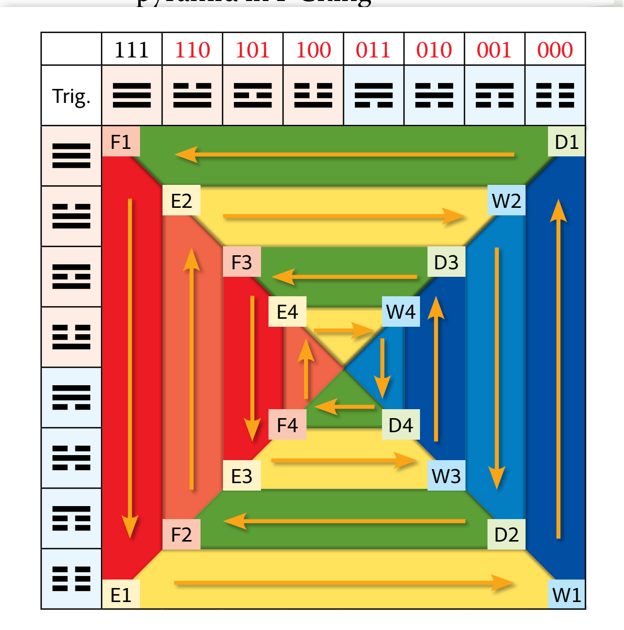
Results

In I-Ching the pyramid is projected from a sequence of primary elements and vectors in the following order: Fire, Earth, Water and Wood. The primary elements occurring along the diagonals specify the element in the column and in the line (Fig. 1).

Fig. 1. Projection of elements in a 4-layer pyramid in I-Ching



Legend: F – Fire; E – Earth; D – Wood; W – Water; 1, 2, 3 and 4 – the marking of layers in the pyramid

The vector direction of the individual elements changes, twice counter clockwise and twice clockwise.

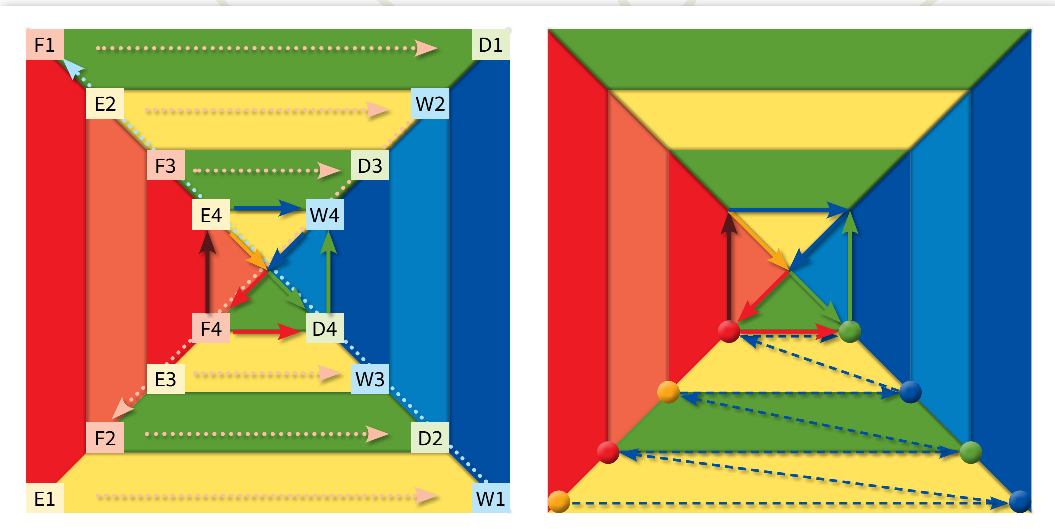
The Fire element is projected in the West and the Water element in the East, the Southern part begins with the Earth element (yellow) and continues with the Wood element (Green) and then Earth alternates with Wood. The Northern part begins with the Wood element, while Wood alternates with Earth (Fig. 1).

All four elements are projected in the Southern and Northern part of the pyramid, namely in the form of points lying along the legs of the isosceles triangle (Fig. 1).

There are four triangles forming the base and sides of the pyramid at the same time. In the book by Professor Muldashev "The Matrix of Life on Earth",[6] the author explains the sequence of elements in the Tibetan system according to the **Lung** principle – which describes the appearance of the ideal world (the sequence of Fire, Earth, Wood and Water) and according to **La** principles – the appearance of reality (Earth, Water, Fire and Wood).[5]

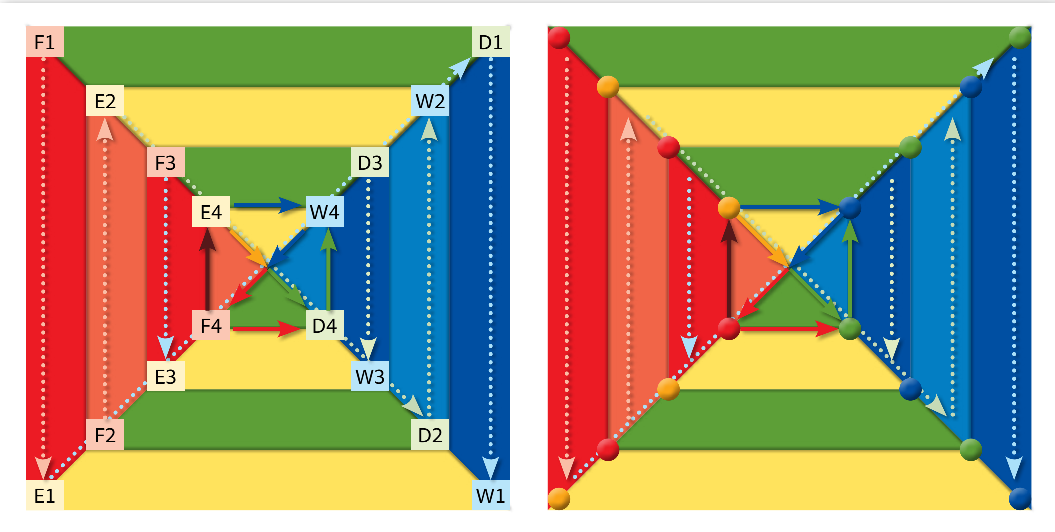
Fig. 2 shows the sequence of elements La – the real world. This principle is projected into the Earth and Wood area, while functioning separately in the Earth area in the southern part (Fig. 2).

Fig. 2. LA principles and their projection in the area of Earth and Wood elements (South, North) on the left and in the Earth area (South) on the right in the projection I-Ching



The sequence of elements Lung represents the ideal world, the projection of Lung principles in the Fire and Water area (Fig. 3).

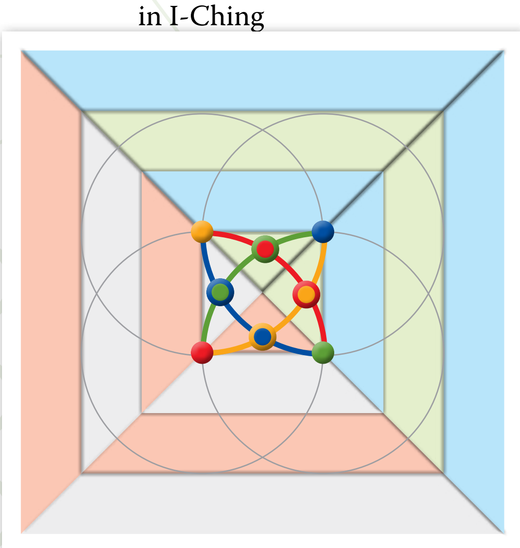
Fig. 3. LUNG principles and projection in the area of the Fire element (West) and the area of Water in I-Ching projection



The sequence of elements according to Lung and La principles creates dynamics among elements, which is projected in a dextrorotary and levorotary swastika, forming mirror symmetry on the vertical and horizontal level.

In the middle of the square (I-Ching projection, Fig. 4) the fourth layer of the pyramid is projected. It contains four elements in the form of triangle intersections. The circuits of circles (with centres at the tops of the square) form "eyes" in their intersections. Each half of this "eye" comprises of two elements (Fire – Water or Wood – Earth, analogously Wood – Metal). At the same time the elements form a flower with four petals (the first chakra). The connecting lines of circles intersect in eight points, which form the first octogram, in acupuncture known as Bagua (Fig. 4).

Fig. 4. Projection of the first eye (Wood-Metal) and the second eye (Fire-Water), Projection of Bagua and the first chakra in I-Ching



According to the Chinese medicine in I-Ching octogram is formed by the primary elements Metal, Wood, Fire and Water – and four transitory elements Fire Water-Wood Water-Water Metal-Metal Fire (Fig. 4).

The sequence of Lung and La principles is projected in the projection of both eyes. These form dynamics as shown in Fig. 5. Vectors of elements have opposite orientation in the layers (Fig. 5).

Similarly as vectors of element sequence according to Lung and La arrangement form dynamics, so does the sequence **according to the 9^th palaces** form a system of element sequence, which showcases the **symmetric flow of Qi energy.** The sequence of element arrangement according to 9^th palaces can be seen on the projection of the first chakra, on the "two eyes" projection (Fig. 6).

Fig. 5. Meridians, chakra and eyes in geometry in the I-Ching projection

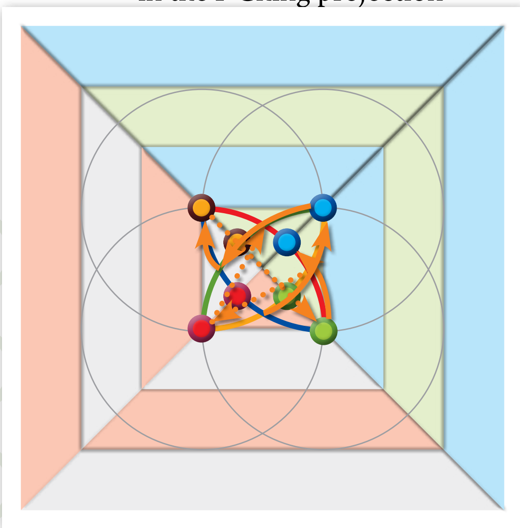
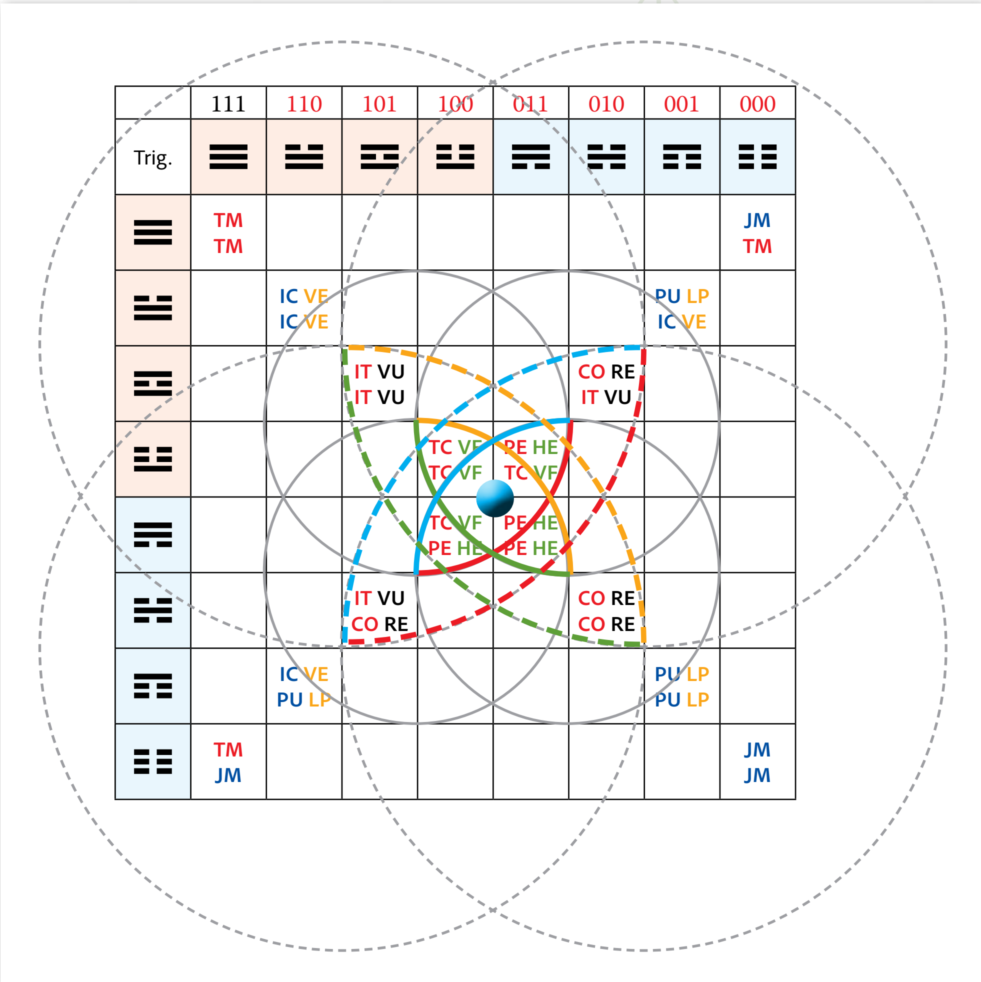


Fig. 6. The arrangement of primary meridians in I-Ching according to Fu-Xi



In the centre occurs the minimum yang and yin (the most subtle energy) and towards the periphery the energy *"materializes"*, the yin and yang potency increases. The last meridians are meridians of the control trajectories, *the front middle trajectory (RenMa i-tranjectory of inception) and back middle trajectory (DuMai),* which coordinate and control the body processes. Eyes have their projection in the centre of I-Ching, where the meridians of liver, pericardium, gall bladder and triple heater are also projected. On this layer, a flower with four petals is formed from sections of the circles; these form the first chakra (Fig. 5).

Discussion

Currently, numerous authors attempt to apply the traditional and innovative approaches of theoretical and practical usage of knowledge from the Book of Changes in various areas of chemistry, music, physics, mathematics and sacred geometry.[7][9] Chronopuncture has traditionally applied the bio-rhythmical regularities in its practice.[1]

The application of theoretical knowledge from the Book of Changes in acupuncture practice, be it from the viewpoint of elements or meridians, has its modern followers. González-Correa has attempted to describe the practical application of binary principles in acupuncture with the help of digital depiction and therapy, and the possibility of applying this knowledge in future practice.[3]

Elements and meridians in acupuncture from the viewpoint of the Book of Changes were analysed by authors, who included the bio-rhythmical characteristics according to primary elements – either from the point of view the Chinese tradition or an innovative way.[1] The theoretical knowledge is tested in clinical practice.[5] It seems that the inexhaustible source of knowledge in the Book of Changes remains an inspiration for many scientific fields.

Conclusion

The platform of I-Ching offers various research opportunities, such as meridians, chakras, pyramids or geometric projection of the eye, which have seemingly nothing in common, but which in fact share a common denominator, i.e. binary and geometric representation.

The sequence of primary elements was shown on the base of the Book of Changes which forms four layers. The sequence principles apply there according to the Tibetan medicine (Lung and La) and the succession of Chinese medicine (according to the 9th palaces). The swastika rotating in both directions, which is created by a sequence according to Tibetan medicine and Chinese medicine, forms the initial octagram (Bagua).

These findings are applicable in clinical acupuncture practice and the study of rotary microsystems of the eight projections (Bagua).

editor reviewed

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Биоматериалы Аллоплант в зеркале натуральной медицины

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Резюме

В статье изложены основные исторические этапы развития теории трансплантации тканей. Показано, что регенеративная хирургия зародилась как закономерный результат разработки проблем тканевых пересадок. В эволюции идеи трансплантации тканей авторами выделены следующие исторические вехи: этап трансплантационной заместительной хирургии, этап трансплантационной регенеративной хирургии и этап трансплантационной биостимуляции.
Показано, что технология Аллоплант, являясь органичной составной частью натуральной медицины, включает в себя все вышеуказанные научные концепции тканевых пересадок. При этом ведущим фактором выступает процесс репаративной регенерации тканей реципиента на фоне моделирующего влияния биоматериалов Аллоплант. Полученные результаты позволили авторам сформулировать концепцию регенеративной хирургии на основе трансплантационной технологии Аллоплант[6].

Ключевые слова

регенеративная хирургия, биоматериалы Аллоплант, трансплантация тканей, тканевые банки.

Трансплантация тканей, отдельных частей тела и целых органов — одна из наиболее волнующих, и в известном смысле, трагических страниц в истории медицины, да и всей человеческой цивилизации. По нашему мнению, на историю трансплантологии можно взглянуть как на цепочку сменяющихся этапов ее развития. Сразу отметим, что выделенные нами исторические вехи в развитии теории и практики тканевых пересадок не являются строго ограниченными и нередко хронологически перекрывают друг друга.

Первоначально трансплантация тканей проводилась исключительно с заместительной целью. На данном этапе трансплантат рассматривался как биологический материал, замещающий дефект отдельного органа. Сама хирургическая операция при этом преследовала единственную цель — восполнить анатомический дефект в конкретной области тела. Поэтому данный период в развитии тканевых пересадок мы условно называли **этапом заместительной трансплантационной хирургии.** Хронологически данный этап приходится на вторую половину XIX и начало XX века. Основными требованиями к донорской ткани было соответствие ее формы размерам и характеру замещаемого дефекта. Однако было бы ошибочно полагать, что трансплантация тканей имеет всего лишь вековую историю. Сама идея пересадить донорские ткани и заместить дефект органа или ткани у реципиента, выполнить восстановительную операцию на поверхности тела существовала столько же, сколько существует медицина.

Так, остались отдельные упоминания о том, что еще в средние века предпринимались попытки пересадить донорские ткани, полученные от

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различных животных. К примеру, операция замещения дефекта черепа при трепанации[4]. Подобная операция была выполнена с использованием, как сейчас принято говорить, ксеногенного костного трансплантата, полученного от собаки. Этот пример показывает, что медицинская наука всегда стремилась воспользоваться донорскими тканями, с целью восполнить дефект тканей при поражении тех или иных органов. Известны также случаи переливания донорской крови, которые, как правило, преследовали заместительную цель. Во всех описанных случаях усматривается единая задача — восполнить дефект тканей. Именно в таком виде научная трансплантология сформировалась в середине XIX века. При этом были предприняты многочисленные попытки пересадок костной ткани, дермы. Выполнялись также различные аутопластические операции.

В развитие заместительного этапа трансплантационной хирургии значительный вклад внесли многие исследователи. Вершины хирургической техники при выполнении операций с использованием различных видов трансплантатов достиг Н. И. Пирогов. В его монографии «О пластических операциях вообще и ринопластике в особенности» (1835) обобщается опыт трансплантационной хирургии с заместительной целью.

В связи с развитием трансплантационной хирургии уместно вспомнить киевского офтальмолога А. Ф. Шимановского, который в 1906 году разработал операцию по пересадке переднего сегмента глазного яблока. От трупов-доноров он заготавливал полностью передний сегмент глазного яблока, который включал роговицу, часть конъюнктивы, склеру, цилиарное тело. Весь этот комплекс пересаживался реципиенту с целью замещения пораженного переднего отрезка глазного яблока. С сегодняшних позиций, очевидно, что упомянутые операции недостаточно обоснованны и трансплантаты не могли прижить или оказать благотворное влияния на течение болезни. Профессор А. Ф. Шимановский выполнил три подобные операции, и все они закончились безуспешно. Однако на том этапе развития медицинской науки, описанные операции продемонстрировали кризис заместительной трансплантационной хирургии и явились стимулом для дальнейших исследований.

В связи с последующим накоплением научных фактов, зарождалось новое направление в трансплантационной хирургии. Этот этап по меткому определению И. А. Голяницкого[2] был назван **этапом регенеративной хирургии.** С учетом современного опыта данный период можно назвать **регенеративной трансплантационной хирургией.** Следует отметить, что работы И. А. Голяницкого не вышли за рамки экспериментов. Однако принципиально важно, что автор обратил внимание на процессы репаративной регенерации со стороны тканевого ложа при пересадке донорского материала. Именно это позволило И. А. Голяницкому определить методы трансплантации тканей как регенеративную хирургию. В последующем отдельные исследователи рассматривали трансплантацию именно в аспекте регенеративной хирургии. Так, основатель первого в Европе тканевого банка R. Klen[8], исследуя биологическую активность трансплантатов, указал на стимуляцию репаративных процессов со стороны тканевого ложа. Подобные трансплантаты он относил к аллостатическим.

Однако приведенные примеры по изучению регенерации тканей при трансплантации представляют собой разрозненные научные факты, не объединенные общей теорией. Кроме того, клиническая практика оказалась не готовой к восприятию новой идеи. И связано это, прежде всего, с отсутствием адекватных методов консервации, хранения и морфологического тестирования трансплантатов. В результате научные изыскания, опередившие свое время, не получили широкого распространения в клинической практике. Примечательно, что зарождение регенеративной медицины ставит методы трансплантации биологических тканей в один ряд с технологиями натуральной медицины.

В двадцатые годы прошлого века выполняется серия новаторских работ академиком В. П. Филатовым по пересадке роговицы[7]. Первоначально это была трансплантация, осуществляемая с заместительной целью, поскольку донорская роговица использовалась как ортоптический биоматериал, пересаживаемый в идентичное ложе. Основной целью данной трансплантации было сохранение пересаженной роговицы в прозрачном состоянии.

Разрабатывая данную проблему, В.П.Филатов обратил внимание на тот факт, что донорская роговица оказывает не только местное влияние на тканевое ложе, но и приводит к позитивным структурным изменениям в патологических тканях контрлатерального глаза. Исходя из данного наблюдения, В.П.Филатов сделал исключительно важный вывод о том, что трансплантаты при пересадке оказывают системное влияние на организм, и потому проблему трансплантации недостаточно рассматривать с заместительных и даже с регенеративных позиций. Если регенеративная концепция рассматривает трансплантацию локально, лишь в зоне тканевого ложа, то В.П.Филатов взглянул на эту проблему совершенно с другой стороны, с позиции взаимодействия в системе трансплантат-реципиент. Указанная концепция была названа автором «тканевой терапией». Говоря современным языком, появилось новое направление, которое рассматривало реакцию всего организма на трансплантацию тканей.

На чем строилась указанная теория? В.П.Филатов считал, что после забора ткани у донора и хранения ее в определенном режиме, в ней накапливаются вещества особого класса, которые он назвал биологически активными. После пересадки реципиенту данные вещества, попадая в общее кровеносное русло, проявляют свой биостимулирующий эффект. В трудах В.П.Филатова описаны случаи излечения больных с сахарным диабетом путем аллотрансплантации кожи. Для этого он брал кожный аллотрансплантат у донора и пересаживал реципиенту, страдающему сахарным диабетом в поясничную область. При этом наблюдалась частичная или полная нормализация углеводного обмена. Используя аналогичную методику, В.П.Филатов также излечил несколько пациентов с хроническим кавернозным туберкулезом легких. Эти результаты он считал следствием общебиологического или системного действия трансплантатов на организм. По мнению В.П.Филатова, после пересадки тканевого трансплантата начинается нормализующее действие биологически активных веществ, содержащихся в донорских тканях, на организм реципиента. При этом он показал, что в качестве источника биологически активных веществ, можно использовать не только ткани трупа-донора, но и другие ткани животного и растительного происхождения. Автор считал, что любые биологические структуры после их выключения из общего метаболизма, независимо от источника донорского материала, входят в состояние переживания, накапливая при этом биологические активные вещества. И потому биостимуляторы он получал из самых различных источников: растений, микроорганизмов и т.д. Аналогичным путем были созданы препараты экстракта алоэ, стекловидного тела, которые также прошли этот процесс переживания. Теория тканевой терапии была новым уровнем осмысления проблем трансплантации. Это был переворот в понимании взаимодействия трансплантата и реципиента. Стало ясно, что в этом взаимодействии участвуют все интегративные системы организма: нервная, эндокринная, иммунная система. В.П. Филатов заложил основы концепции биостимуляции, которая успешно развивалась далее в трудах других ученых[3].

Дальнейшая эволюция идеи трансплантации не миновала интересных исторических коллизий. В 60-е годы минувшего столетия мир стал свидетелем рождения новых полимерных химических технологий. Стали создаваться полимеры с самыми разнообразными механическими свойствами, хорошо моделируемыми, и, казалось бы, инертными при пересадке. И многие исследователи пришли к выводу, что эпоха трансплантации донорских тканей подходит к концу. Человечество создало полимеры, которые на первый взгляд могут заменить донорские ткани, и с ними успешно можно будет выполнять пластические операции на поверхности человеческого тела, фиксировать внутренние органы, успешно лечить прогрессирующую миопию, выполнять множество других операций. На этих принципах было построено целое направление в медицине. Травматология и ортопедия взяли на вооружение металлоконструкции и полимеры, офтальмология — искусственный хрусталик, породивший целую эпоху в глазной хирургии. Приоритет в данной области принадлежит известному офтальмологу, академику С.Н.Федорову, разработавшему оригинальную модель искусственного хрусталика и широко внедрившему его в клиническую практику. Искусственные суставы и множество других эксплантатов заняли место донорских тканей. Все шло к тому, что донорская служба со своими традиционными взглядами отойдет на второй план, а со временем прекратит свое существование.

Однако эти выводы оказались преждевременными. Проходят не более двух десятилетий, и трансплантация тканей со службой тканевых банков возрождаются вновь. После многолетних клинических испытаний полимеров стало очевидно, что на сегодняшний день клиническая практика не может обойтись без донорских тканей. Синтетические ткани не могут выполнять те многочисленные функции, которые выполняют донорские ткани после пересадки в организм реципиента. Итак, трансплантация тканей возрождается вновь с широкой сетью тканевых банков и с научным багажом, наработанным за годы двадцатого столетия.

Почему же эксплантаты не оправдали тех надежд, которые первоначально с ними связывали медицинская теория и практика? Главная причина на наш взгляд, кроется в том, что синтезированные «эквиваленты биологических тканей» полностью исключают принципы регенеративной хирургии и переносят трансплантологию в орбиту заместительной хирургии.

Из каких же принципов исходит сформулированная нами концепция трансплантации тканей, и что составляет краеугольный камень созданных четыре десятилетия назад биоматериалов Аллоплант? Прежде всего, указанные три этапа эволюции, достаточно условно обозначенные в настоящем обзоре, входят в базовые принципы создания Аллопланта, которые на наш взгляд удачно сочетают в себе все исторически сформировавшиеся принципы. Так, пересаживая любой вид биоматериала Аллоплант, на первом этапе, мы обязательно рассчитываем на его заместительную функцию. Однако «заместительная» теория здесь принимает совершенно другой оборот и рассматривается с иных позиций. Она применима только на том этапе пост трансплантационного периода, пока донорская ткань сохраняет свою структуру. Именно присутствие заместительного этапа требует подбора вида биоматериалов Аллоплант с адекватными пластическими и биомеханическими свойствами, что позволяет смоделировать контуры тела, восстановить анатомическую целостность той или иной области.

В последующем на первый план выступают принципы регенеративной хирургии, и на месте трансплантата формируется регенерат с характерными свойствами и гистохимическим составом. Сейчас можно с уверенностью утверждать, что раскрыты основные механизмы, избирательно воздействующие на регенерацию различных тканей[1][5][6]. Данные процессы определяются очень широким кругом факторов, которые исследовались также в работах П. П. Коваленко[3] и изложены в научных изданиях Центрального института травматологии и ортопедии, а также тканевых банков Новосибирска, Екатеринбурга, Санкт-Петербурга и других.

Концепция тканевой терапии по В. П. Филатову также претерпела существенные изменения, совершенствуясь и изменяясь на основе многолетнего опыта, и в настоящее время должна рассматриваться с учетом реакций иммунной, нервной и эндокринной систем. Именно эти три системы и включают механизмы ответных реакций при трансплантации. При этом местные реакции вторичны и подчиняются системным. Следует также учитывать, что ответная реакция может быть различной: от классической биостимуляции, которую обнаружил В. П. Филатов, до избирательного воздействия на нервную систему, иммуномодулирующего влияния, воздействия на гормональные факторы.

Разработанная во Всероссийском центре глазной и пластической хирургии методика введения биоматериалов Аллоплант в биологически активные точки — это, по сути, синтез системного воздействия трансплантата на организм реципиента с традиционными оздоровительными системами Востока[6].

Все изложенные аспекты интегрирует в себе трансплантационная технология Аллоплант, удачно сочетая весь опыт, накопленный трансплантационной заместительной хирургией, трансплантационной регенеративной хирургией и, наконец, системным влиянием биоматериалов на организм реципиента — трансплантационной биостимуляцией. Именно на стыке этих трех исторически развивающихся направлений в трансплантологии сформировалась, на наш взгляд, современная трансплантационная технология Аллоплант. На сегодняшний день, соединенные в рамках общей теории, они составляют базис современного **этапа биологической трансплантационной хирургии.** Биологической — потому что здесь присутствуют фактор заместительной функции биоматериала и фактор репаративной регенерации с самыми различными аспектами. Здесь включаются разнообразные механизмы дифференцировки клеток, замещения и перестройки структуры трансплантатов, формирование на его месте адекватного регенерата. Это чрезвычайно обширный спектр биологических взаимодействий, который происходит как в тканевом ложе, так и в самом трансплантате. При этом местные процессы реализуются под регулирующим влиянием нейроэндокринных механизмов, гуморальных факторов, иммунной системы, которые в совокупности реализуют весь комплекс местных процессов. Все описываемые взаимодействия мы определяем как систему трансплантат-реципиент и относим ее к биологической трансплантационной хирургии.

Для нас также очевидно, что именно **регенеративная хирургия** составляет основу общебиологического подхода в трансплантологии. И связано это с рядом причин. Прежде всего, направленность и динамика локальных репаративных процессов определяют структуру формирующегося на месте биоматериала регенерата. Как известно, его морфологические особенности во многом зависят от структуры и гистохимического состава пересаживаемого биоматериала[5][6]. С другой стороны, репаративный процесс в области аллотрансплантации обеспечивается целым комплексом механизмов центрального порядка[1]. Речь идет о факторах, которые с известными оговорками относятся к сфере «трансплантационной биостимуляции». Другими словами, в процессах репаративной регенерации преломляются все механизмы локального и системного взаимодействия, что и позволяет нам рассматривать регенеративную хирургию как главное звено биологического подхода в современной хирургии.

Изложенные в обзоре аспекты регенеративной и биологической хирургии при пересадке биоматериалов Аллоплант подробно рассматриваются в трудах Э. Р. Мулдашева и его сотрудников[6]. Полученные при этом результаты составили теоретический базис нового поколения биоматериалов, успешно используемых во всех сферах современной медицины. Представленный обзор развития технологии регенеративной медицины Аллоплант позволяет утверждать, что трансплантация данных биоматериалов является органичной составляющей концептуальной модели натуральной медицины. Подобный вывод базируется, с одной стороны, на биологическом происхождении донорского материала, с другой стороны, на многоуровневом механизме реализации всего комплекса саногенных факторов Аллопланта.

В заключение следует отметить, что к настоящему времени технология трансплантации биоматериалов Аллоплант являет собой единственный пример широкого и эффективного использования концепции регенеративной медицины во всех сферах клинической практики.

редакционно рецензируемых

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Alloplant Biomaterials Reflected in Natural Medicine

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(English version of the previous Russian article)

Summary

This article contains the most important stages of the development of the theory around tissue transplantation. It is shown how regenerated surgery originated as a natural result of the efforts to solve the problems involved in tissue transplantation. The authors have highlighted the following historical phases in the procedure's evolution: the replacement transplant stage, the regenerative surgery transplant stage and the bio-stimulation transplant stage. It is shown that Alloplant technology, one of the fundamental compositor parts of natural medicine involves all of the aforementioned scientific concepts involved in tissue transplantation. The most important part of this is the process of reparatory regeneration of the recipient's tissues aided by the Alloplant biomaterials. Scientific findings led the authors to conceive of the idea of regenerative surgery with the aid of Alloplant transplantation technology.[6]

Key words

regenerative surgery, Alloplant biomaterials, tissue transplantation, tissue banks

The transplantation of tissues, individual parts of the body and entire organs is one of the most dramatic and in the popular sense of the word, the most tragic chapters in the history of medicine and indeed the history of mankind. As far as we are concerned the history of transplantation can be viewed as a chain of the consecutively evolving stages of development. It is worth noting right away that the phases we have highlighted are not rigidly defined and very often intercept one another.

In the beginning tissue transplantation was performed solely as a means of substitution. At that point in time, the graft was viewed as a biological material, eliminating the defect of a specific organ. The surgical operation itself had one aim, to correct an anatomical defect in a particular part of the body. Consequently, we have named this stage in the procedure's development the **phase of substitution transplant surgery.** To provide some historical context this phase lasted from the second half of the 19th century until the first half of the 20th century. The key requirement of donor tissue was its compatibility with the size and character of the problem in question. However, it would be wrong to assume that the history of tissue transplantation dates back merely a century. The idea of transplanting donor tissue and treating defects and carrying out recovery surgery on the outward bodily surface has been around for as long as the practice of medicine. Several records exist which mention how there were attempts, even in the middle ages to transplant donor tissues taken from various different animals. For example, the operation to skull defects by means of trepanation.[4] A similar operation was carried out with the use of, as we now like to say, heterologous bone graft, taken from a dog. This example shows the way in which medical science has always striven to make use of donor tissue with the aim of fixing problems in human tissue from all sorts of organs. Another such common case is that if blood transfusions which also generally functioned as a means of substitution. In all of

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the instances described we can see one common task – the restoration of the tissue defect. It is in this way that scientific transplantation evolved in the middle of the 19th century. Many attempts were made concurrently to transplant bone tissue, derma. Other various autoplastic operations were also performed. Many scientists made significant contributions as the replacement phase evolved.

N. I. Pirogov achieved the most in surgical technique with a wide variety of transplant materials. In his monograph "About plastic surgery in general, and rhinoplasty in particular" (1835) which summarizes the history of substitute transplant surgery. Regarding the development of transplant surgery we cannot forget the Kiev ophthalmologist A. F. Shimanovsky who in 1906 crafted a procedure to transplant the anterior part of the eyelid. He used cadaver donors to prepare the entire anterior part of the eyeball, including the cornea, part of conjunctiva, sclera and ciliary body. All of these were transplanted to the recipient with the aim of replacing the afflicted. Looking back, it is obvious that the aforementioned operations were not sufficient enough and the grafts had no chance of lasting or having any beneficial effect on the length of the disease. Professor A. F. Shimanovsky carried out three such operations and each and every one proved unsuccessful. However, these operations did manage to highlight the crisis there was at the time in the development of replacement transplant surgery, acting as an incentive for further studies. Subsequent scientific experimentation produced a new direction in transplant surgery. This stage, according to the precise definition of I. A. Golianitsky[2] was named the **phase of regenerative surgery.**

With the aid of modern experience we can call this period – the stage of **regenerative transplant surgery.** It is worth noting that the work of I. A. Golianitsky never went beyond the realm of experimentation. However, it is of vital importance that the author drew attention to the process of reparative regeneration with the focus on the tissue bed itself during the procedure. It is precisely this which allowed I. A. Golianitsky to define the methods of tissue transplantation as regenerative surgery. Various subsequent researchers have viewed transplantation in precisely this manner. Consequently, the founder of the first tissue bank in Europe, R. Klen,[8] whilst studying the biological activity of grafts pointed out the stimulation of reparatory processes in the tissue bed. He grouped similar such transplants under the title of allostatics.

However, the examples we have for the study of tissue regeneration during the transplantation are very disparate and in no way linked. Apart from that, clinical practice has also proven reluctant to accept new ideas. This is linked, first and foremost, to the absence of suitable means of conservation, preservation and morphological transplant testing. As a result, scientific experimentation, greatly ahead of its time, has been widely ignored in medical practice. It is remarkable that the emergence of regenerative medicine puts the methods of biological tissue transplantation in one group with the practices involved in natural medicine. V. P. Filatov carried out a series of innovative studies on the transplantation of corneas back in the 1920-s.[7] Originally, this was transplantation with a replacement function as the donor cornea was used as ortho-optic biomaterial, transplanted into an identical tissue bed. The main aim of the transplantation in question was the preservation of the transplanted cornea in the transparent condition.

During his work on the tissue V. P. Filatov stressed that the donor cornea not only affects the tissue bed, but also brings about positive structural changes in the pathological tissue of the contralateral eye. With that in mind, V. P. Filatov came to the important conclusion that the graft does have a systemic effect on the organism, during the transplantation. Consequently, it is insufficient to view transplantation from simply a substitute or even from a regenerative perspective. If regenerative theory places transplantation in a convenient context, merely in the tissue bed area, then V. P. Filatov viewed the problem from a completely different angle, from the point of view of collaboration between the recipient and the graft in the organism. The theory in question was called "tissue therapy" by the author. To use the modern term, a new approach emerged which studied the reaction of entire organism to the transplanted tissue.

Upon what was the aforementioned theory based? V. P. Filatov believed that following the isolation of donor tissue and its preservation in a special environment, it begins to accumulate particular substances which he called biologically active. Following the operation these substances pass into general circulation and begin to exert a bio-stimulating effect. Cases of diabetic patients being cured with allotransplant skin feature in the works of V. P. Filatov. To achieve this he took allotransplant skin from the donor and transplanted to the diabetic patient in the waist area. A partial and complete stabilization of the carbohydrate metabolism occurred during this time. Using similar methodology V. P. Filatov also cured several patients with chronic cavernous pulmonary tuberculosis. He believed these findings to be the result of general biological and systemic effect of the graft on the body. According to V. P. Filatov a process of normalization begins post procedure. At the same time he proved that it is possible to use not only tissues of cadaver-donor but also animals and plants as sources of biological active substances. The author believed that any biological structures, regardless of their source, go into survival mode when they leave their host form by means of accumulating these biologically active substances. As a result he took bio stimulators from a variety of different hosts: plants, microorganisms and many more. Preparations of aloe extracts, vitreous body were also sourced in a similar way which also underwent this survival process. The theory of tissue therapy was a new level of thinking in the field of transplantation. This was a turning point in our understanding of the collaboration between the graft material and the recipient. It became evident that all the integral bodily systems play a part in this process: the nervous, endocrine and immune systems. V. P. Filatov had provided the founding principles of bio-stimulation which were successfully developed further in the studies of other scientists.[3]

The further evolution of transplant theory was full of interesting collisions. In the 1960-s the world witnessed the birth of polymer chemical technologies. Polymers began to develop with a wide variety of mechanical properties, well modelled and it would seem innocuous during the transplant process. Many scientists concluded that the era of donor tissues was coming to an end. Mankind had created polymers which at first glance seemed to replace donor tissues, work successfully during plastic operations on the outer bodily surface, fix in place internal organs, treat progressive myopia and perform a great many more surgical procedures. A new field in medicine was built on the basis of those principles. Traumatology and orthopaedics adopted the use of metallic constructions and polymers, ophthalmology – the artificial lens, giving rise to an entire era of eye surgery. The most important figure at this time was the famous ophthalmologist, academician S. N. Fyodorov who created an ingenious model of the artificial lens and introduced it into general medical practice. Artificial joints and many other explants took the place of donor tissues. Ultimately it seemed that donor practice with its traditional views would become side-lined and with time cease to exist.

However, these views proved premature. No more than twenty years later and tissue transplantation with the aid of tissue banks was back. After many years of clinical trials it became evident that modern day medicine would not survive without tissue donation. Synthetic tissues are not able to perform the same variety of functions which donor ones can, post procedure, in the body. Consequently, tissue transplantation was reborn with a wide network of donor banks and academic baggage, perfected over the course of the 20th century.

Why did explants not live up to the expectations with medical theory and practice originally placed upon them? In our opinion, the main reason is that synthesised equivalents completely defy the principles of regenerative surgery and place transplantation back in the realm of substitution surgery.

On what basis did our theory of tissue transplantation originate and what was the turning point forty years ago which gave rise to Alloplant biomaterials? First of the three aforementioned evolutionary stages covered in this article feature in the basic principles of the creation of Alloplant which we believe successfully incorporate all theories formulated to date. Therefore we rely on Alloplant materials, in the first instance, for their substitute function. However, "substitution" theory here takes on a completely different role and can be viewed in an entirely new way. It is used only after the procedure when the donor tissue has yet retained its structure. The existence of the substitute phase requires the collection of many different types of Alloplant materials with adequate plastic and biomechanical properties which allow to model the bodily contours, restore their anatomical integrity of the various different body parts. Subsequently the principles of regenerative surgery came to the fore and a substitute formed in place of the graft with all its characteristic properties and histo-chemical composition. It is now possible to assert confidently that the principle mechanisms we have discovered work selectively on the recovery of different tissue types.[1][5][6] The processes in question are defined by a very wide array of factors depicted in the work of P. P. Kovalenko[3] and included in the academic publications of the Central institute of traumatology and orthopaedics, in addition to the tissue banks of Novosibirsk, Ekaterinburg, St. Petersburg and elsewhere.

V. P. Filatov's theory on tissue therapy underwent many changes, perfecting itself and altering on the basis of many years' experience and should currently be viewed taking into account the reactions of the immune, nervous and endocrine system. It is very systems which produce the response reactions during transplantation. At the same time secondary localized reactions give way to systemic ones. It is also worth noting that the response reactions can vary: from classic bio stimulation discovered by V. P. Filatov to the selective effect on the nervous system, immunizing influence and the effect of the hormones. The technique of implanting Alloplant biomaterials into biologically active areas of the body put together in the Russian Eye and Plastic Surgery Centre is in essence equivalent to the systemic effect of the graft on the recipient with the traditional healing methods of the East.[6]

All the factors mentioned make use of the Alloplant transplant technique successfully combining all the experience, amassed by substitute, regenerative and eventually bio-stimulation surgery. As far as we are concerned, it is precisely on the basis of these three premises, developed over time in transplantation, that modern Alloplant methods were conceived. Currently, brought together under one common theory, they comprise the basis of the modern practice of **biological transplant surgery.** Biological – because it involves replacement and reparative regeneration features with incredibly varied elements. A variety of mechanisms is applied in cell differentiation, replacement and rebuilding of graft structures and the forming of adequate regenerate features in this. This is an extremely wide array of biological effects which occur both in the tissue bed and in the graft itself. At the same time localized processes occur under the regulatory influence of neuroendocrine mechanisms, humeral factors of the immune system which together are responsible for the entire complex of localized processes. All the effects depicted are commonly known as the graft-recipient system and come under the title of biological transparent surgery.

For us it is equally evident that **regenerative surgery** makes up the basis of the general biological approach in transplantology. This is due to various reasons. Above all, the direction and dynamics of localized, reparation processes define the structure of the forming regenerate in place of biomaterial. As we know its morphological features largely depend on the structure and histo-chemical composition of the transplanted biomaterial.[5][6] On the other hand, the reparatory process in Alloplant practice is facilitated by an entire group of central order mechanisms.[1] We are talking about the features which, with certain reservations, fall into the bio stimulation group. In other words, during the reparatory regeneration process all the mechanisms of localized and systemic character are contravened which leads us to view regenerative surgery as the main feature of the biological approach to modern surgery.

The elements of regenerative and biological surgery, during Alloplant transplantations, included in this article are covered in great detail in the work of E. R. Muldashev and his colleagues.[6] The findings made, formed the theoretical basis of a new generation of biomaterials, successfully utilized in all areas of modern medicine. The account of the evolution in the methodology of regenerative Alloplant medicine allows us to assert that the transplantation of the biomaterials in question is an organic component of the conceptual model of natural medicine.

This conclusion can be made firstly about the biological origins of donor tissue and, secondly about the realization of the multi layered mechanisms in the entire array of cyanogen Alloplant features. In conclusion, it is important to assert that the techniques involved with Alloplant biomaterials are the sole examples of a wide and effective use of regenerative medicine theory in every aspect of clinical medicine.

editor reviewed

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Устранение мышечно-болевого синдрома и коррекция позвоночника аппаратом Corden (Cordus)

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Резюме

Целью исследования явилось изучение эффективности применения аппаратной разгрузки паравертебральных мышц в сочетании с коррекцией функционального состояния нервной системы устройством Corden (Cordus). «Corden» (в некоторых странах Cordus) — инновационный ортопедический аппарат, конструкция которого позволяет погружаться в зону паравертебральных мышц и расслаблять их. Курс реабилитации проводили в отделении физиотерапии у 19 пациентов (9 мужчин и 10 женщин), в возрасте от 23 до 65 лет с разными вариантами мышечно-болевого синдрома. Для устранения мышечного спазма нами использовалось аппаратная разгрузка позвоночно-двигательных сегментов (ПДС), позволяющая преимущественно расслабить глубокие мышцы спины, находящиеся в состоянии гипертонуса. Результаты механического воздействия аппарата на ПДС в сочетании с релаксационным действием биотоков на организм выражаются в улучшении самочувствия, устранения болевых ощущений и снижения уровня нервно-психического напряжения.

Ключевые слова

мышечно-болевой синдром, мед.аппарат Corden (Cordus), мышечный спазм, релаксационное действие биотоков

Введение

Мышечно-болевой синдром — одна из ведущих неврологических причин временной нетрудоспособности активной части населения. Причины данного мышечно-болевого синдрома (МБС) достаточно разнообразны, хотя несколько из них являются наиболее типичными. Травматизацию мышц, приводящую к формированию МБС, связывают прежде всего с мышечной перегрузкой.

Достаточно популярным и часто применяемым способом устранения миофасциальных болей от физического и психоэмоционального перенапряжения является массаж. Однако проблема поиска и применения новых эффективных способов устранения перенапряжения, болевого синдрома и нормализации нарушений функционального состояния нервной системы, остается актуальным в условиях сегодняшней гиподинамии и повышенных психических нагрузок.

В связи с этим целью исследования явилось изучение эффективности применения аппаратной разгрузки паравертебральных мышц в сочетании с коррекцией функционального состояния нервной системы устройством Corden.

Методика

В качестве применения аппаратной разгрузки позвоночника применяли устройство для коррекции нервной системы, позвоночника и паравертебральных мышц «Corden». Corden — инновационный ортопедический аппарат, конструкция которого позволяет погружаться в зону паравертебральных мышц и расслаблять их. В Corden также модулируются биотоки, позволяющие менять функциональное состояние нервной системы (НС) в сторону релаксации, т. е. обладают антистрессовым эффектом (Рис. 1, Рис. 2). Процедура коррекции позвоночника и тонуса околопозвоночных мышц заключалась в том, что пациенту в положении

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лежа ставили аппарат «Corden» под нужный сегмент в шейном, грудном и поясничном отделе позвоночника, т.е. аппарат ставили вдоль центрального энергетического канала тела (сушумна). После 30 минутной коррекции пациент выполнял несколько тракционно-мобилизационных физических упражнений для мобилизации позвонков и укреплении мышечного корсета спины.

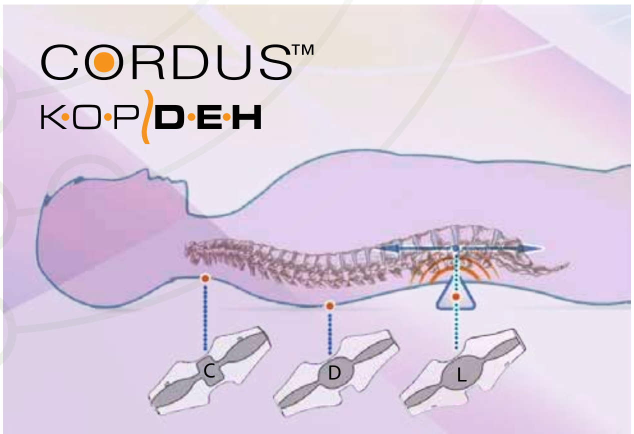
Курс реабилитации проводили в отделении физиотерапии (Федеральное государственное бюджетное учреждение здравоохранения Санкт-Петербургская клиническая больница Российской академии наук) у 19 пациентов (9 мужчин и 10 женщин), в возрасте от 23 до 65 лет с разными вариантами мышечно-болевого синдрома. Перед использованием врачи-физиотерапевты были ознакомлены со свойствами, применением, правильным обращением с устройством. За курс было проведено 12 процедур на каждого испытуемого, в которые входили разгрузка позвоночника на аппарате «Corden» с выполнением специальных упражнений на мобилизацию позвоночно-двигательных сегментов.

Отбор пациентов для испытаний вышеуказанного аппарата проводили после предварительной беседы и получения информированного согласия на исследование. Количественная оценка болевого синдрома проводилась с помощью визуальной аналоговой шкалы (ВАШ)[13]. По методу ВАШ на отрезке прямой длиной 10 см больной отмечает интенсивность боли. Начало линии слева соответствует отсутствию болевого ощущения (0), конец отрезка справа — непереносимой боли (10). Больной должен обозначать интенсивность боли, зная, что ноль соответствует отсутствию боли, а конечная цифра шкалы — максимально выраженной боли, которую пациент испытывал когда-либо в жизни.

Для оценки психофункционального статуса испытуемых использовали определение нейротизма (эмоциональной нестабильности) по Г. А. Айзенку и определения состояния нервно-психического напряжения (НПН) по Т. А. Немчину. Тест Айзенка по определению нейротизма содержит 57 вопросов, отвечая на которые определяется уровень стрессоустойчивости. Опросник Т. А. Немчина представляет собой перечень признаков нервно-психического напряжения, составленный по данным клинико-психологического наблюдения, и содержит 30 основных характеристик этого состояния, разделенных на три степени выраженности. Минимальное количество баллов, которое может набрать испытуемый, равно 30, а максимальное — 90. Обычно у лиц с выраженными болевыми синдромами уровень НПН более 45 баллов. Уменьшение данного показателя будет свидетельствовать об улучшении состояния пациента после курса терапии.

Рис. 1. Аппарат «Corden»

Рис. 2. Механизм действия аппарата Corden



Результаты исследования

По данным психологического тестирования испытуемых после курса коррекции позвоночника и функционального состояния нервной системы (НС), по сравнению с контрольными показателями до разгрузки позвоночника и коррекции состояния НС на аппарате Corden, выявлены достоверно более низкие показатели нейротизма (Табл. 1). Полученные данные, вероятно, свидетельствует о развитии у данных лиц, после коррекционного курса, выраженной эмоциональной устойчивости, способствующей сохранению организованного поведения, ситуативной целенаправленности в обычных и стрессовых ситуациях, характеризующейся «хорошей» адаптацией[9]. Показатели нейротизма до коррекционного курса свидетельствуют о неустойчивости данных лиц в стрессовых ситуациях и «плохой» адаптации.

Показатели нервно-психического напряжения (НПН) так же были достоверно ниже после проведения курса коррекции позвоночника и функционального состояния НС на аппарате Corden (Табл. 1). При этом испытуемые после коррекционного курса (по данным опросника) фактически не высказывали каких либо жалоб на физический и психический дискомфорт и в подавляющем большинстве отдали предпочтение тем пунктам опросника, которые свидетельствуют уже об отсутствии у них прежнего дискомфорта со стороны соматического и психического состояния. Когда происходило расслабление некоторых спазмированных мышц — у ⅓ пациентов всплывали из памяти различные эмоциональные переживания, которые были «заморожены» в этих напряженных мышцах. После такого катарсиса — пациентам становилось психологически существенно легче, а мышцы данного сегмента расслаблялись.

Табл. 1. Показатели тестирования лиц с болевым синдромом в позвоночнике 23–65 лет до и после курса коррекции позвоночника аппаратом Corden (Cordus)

	Ф.И.О.	НПН, баллы до курса коррекции	Нейротизм, до курса коррекции	НПН, баллы после корерккции	Нейротизм поле курса корерккции	Оценка боли до коррекционного курса	Оценка боли после курса коррекции
1	Ш-ва	50	16	4	12	8	5
2	Т-ак	49	14	41	8	7	4
3	М-ва	47	15	42	9	8	4
4	В-на	50	14	44	11	7	5
5	К-ев	54	19	42	11	7	4
6	К-ий	47	15	45	9	9	5
7	К-ов	47	14	41	8	8	3
8	К-ин	49	11	41	8	7	4
9	Н-ин	51	15	45	11	7	3
10	Н-ко	53	13	46	9	6	2
11	М-на	48	12	44	8	7	2
12	Х-ва	46	13	41	10	6	5
13	М-ев	47	16	43	12	8	4
14	С-ко	51	15	40	9	7	3
15	Р-ев	48	13	44	11	6	3
16	Т-ов	46	12	43	9	7	4
17	Ш-ва	49	14	44	10	5	2
18	Щ-на	45	11	41	8	6	2
19	Я-ин	47	13	43	9	6	1
	M ± m	48,7 ± 2,8	14,5 ± 2,9	***42,6 ± 2,9**	***9,6 ± 3,7**	6,9 ± 1,8	**3,2* ± 1,4**

Обозначения: * — указаны достоверные различия с контрольными показаниями. НПН — нервно-психическое напряжение.

Почти все испытуемые отметили нормализацию сна, повышение работоспособности и существенное уменьшение болевых ощущений (Табл. 2). Количественная оценка болевого синдрома показала существенное снижения выраженности боли или даже её исчезновение после проведенного коррекционного курса (Табл. 1). Так пациенты до коррекционного курса имели высокий средний показатель выраженности болевого синдрома в 6,9 ± 1,8 баллов, а после курса коррекции позвоночника уровень боли стал значительно меньше 3,2 ± 1,4. Данные показатели свидетельствуют о том, что у большинства испытуемых боли почти исчезли.

Испытуемые отметили снижение скованности в шейном, грудном и поясничном отделах позвоночник, улучшение подвижности в верхних и нижних конечностях, нормализацию сердечной деятельности, мочеполовой системы, аппетита. При этом было отмечено исчезновение головных болей, «покалываний» в печени; а снижение напряжения в спине и эпигастральной области способствовало улучшению осанки. Большинство испытуемых ощущали «энергетические потоки» (в виде тепла, покалывания и пульсации), идущих вдоль позвоночника до ступней.

Табл. 2. Клинический эффект от применения курса коррекции позвоночника аппаратом Corden у лиц 23–65 лет с болевым синдромом

№ п/п	Пол, возраст	Диагноз	Клинический эффект
1.	Ж, 56	Люмбалгия	Уменьшение болевого синдрома
2	М, 48	Эпикондилит плеча	Уменьшение болевого синдрома
3	Ж, 45	Плечелопаточный периартрит	Уменьшение болевого синдрома, улучшение подвижности в суставе
4	М, 62	Плечелопаточный периартрит	Улучшение подвижности в суставе
5	М, 43	Цервикалгия	Уменьшение болевого синдрома
6	Ж, 37	Люмбалгия	Уменьшение болевого синдрома
7	Ж, 49	Головные боли напряжения	Уменьшение болевого синдрома, исчезновение напряжения в эпигастрии
8	М, 32	ДДЗП, сопровождающиеся болевым корешковым синдромом пояснице	Без отчетливого эффекта
9	Ж, 28	Кифосколиоз, торакалгия	Уменьшение болевого синдрома, уменьшение покалываний в области печени
10	Ж, 39	Сколиоз П, торакалгия	Уменьшение болевого синдрома
11	Ж, 40	Люмбалгия	Уменьшение болевого синдрома
12	М, 54	Торакалгия	Без отчетливого эффекта
13	Ж, 45	ДДЗП, сопровождающиеся болевым корешковым синдромом в пояснице	Уменьшение болевого синдрома
14	М, 47	ДДЗП, сопровождающиеся болевым корешковым синдромом спине	Уменьшение болевого синдрома
15	Ж, 66	Восстановительный период после инсульта. Парез правой верхней конечности	улучшение подвижности конечности
16	М, 65	Боли в спине и шее при профессиональном мышечном перенапряжении	Слабоположительный эффект
17	М, 38	Кифосколиоз, торакалгия	Уменьшение болевого синдрома
18	Ж, 33	Астенический синдром	Улучшение общего самочувствия
19	М, 30	Астенический синдром	Улучшение самочувствия

Дискуссия

Мы считаем, что источником болей в спине у обследуемых являлась болевая импульсация, исходящая из поврежденных тканей как позвоночника, так и находящихся рядом структур: суставов, сочленений, внутренних органов, связок и мышц, как паравертебральных, так и экстравертебральных. Также источником боли в позвоночно-двигательном сегменте могли быть связки и мышцы, надкостница отростков, протрузия диска, синовиальные оболочки межпозвонковых суставов. Вся ноцицептивная импульсация, независимо от ее источника, поступала в ЦНС. Одновременно болевые импульсы активировали альфа- и бета- мотонейроны передних рогов спинного мозга. Активация передних мотонейронов приводила к гипертонусу мышц, иннервируемых данным сегментом спинного мозга.

Считается, что мышечно-болевой синдром (МБС) чаще всего возникает в результате постоянных или повторяющихся мышечных сокращений низкого уровня[17][5]; максимальных и субмаксимальных концентрических сокращений мышц; длительного напряжения отдельных групп мышц — позное перенапряжение при гиподинамии[14][18].

Как отмечено[3][10][11][12] при мышечном спазме происходит стимуляция ноцицепторов самой мышцы. В спазмированных мышцах развивается локальная гиперемия, что усиливает активацию ноцицепторов мышечного волокна. Спазмированная мышца становится источником дополнительной ноцицептивной импульсации, которая поступает в клетки задних рогов того же сегмента спинного мозга. Усиленный поток болевой импульсации соответственно увеличивает активность передних мотонейронов, что ведет к еще большему спазму мышцы. Таким образом, замыкается порочный круг: боль — мышечный спазм — усиление боли — усиление мышечного спазма.

Восстановление функционального состояния организма лиц, подвергающихся значительным физическим нагрузкам, как и лиц с гиподинамией может включать различные виды мануальных и аппаратных методов[2][7][15][16].

Для устранения мышечного спазма нами использовалось аппаратная разгрузка позвоночно-двигательных сегментов (ПДС), позволяющая преимущественно расслабить глубокие мышцы спины,находящиеся в состоянии гипертонуса. Расслабление характеризовалось увеличением подвижности в ПДС. Восстановление подвижности в ПДС одна из важных задач в реабилитационных мероприятиях опорно-двигательного аппарата.

Аппаратное воздействие заключалось в том, что конусообразные выступы устройства, оказывая под весом самого испытуемого давление на группу мышц ПДС, находящихся между поперечными отростками позвонков, приводили к такому их расслаблению, что появлялась возможность локального тракционного воздействия между двумя позвонками. Это в свою очередь способствовало растяжению связочного аппарата в ПДС[4], а биотоки аппарата Corden благодаря медленночастотной модуляции способствуют развитию состояния релаксации.

Давление оказываемое собственным телом помогает сконцентрировать внимание на боли, прочувствовать эту боль и отследить ее устранение под воздействием акупрессуры. На фоне же развития состояния релаксации работала психотелесная техника по устранению боли, восстановлении подвижности в ПДС и снижения дискомфорта и тревожности.

Данные исследований показали (Табл. 2), что работа на ПДС с помощью аппаратной разгрузки позволила не только ликвидировать боли в спине, но и восстановить подвижность в наиболее крупных и часто поражаемых суставах (плечевом, тазобедренном).

Проведенные исследования показали, что при квалифицированном обучении использование устройства коррекции околопозвоночных мышц при отсутствии противопоказаний, у большинства позволяет добиваться положительных результатов. При этом пациенты ощущают изменение своего психо-энергетического состояния, выражающегося в активации энергетики организма, формирования чувства спокойствия и глубокого расслабления. В связи с чем аппарат можно использовать при аккупунктурном воздействии на каналы вдоль позвоночника.

Заключение

1. Воздействие аппаратом осуществляется как на сегментарном, так и на суставном уровнях, что позволяет снять напряжение с разгибателей спины и открыть блокированный сегмент позвоночника и уменьшить, или даже устранить болевой синдром.
2. Аппарат «Corden» глубоко воздействует на околопозвоночные области, совпадающие с энергетическими каналами и являющимися рефлекторными зонами, через которые происходит регуляция деятельности внутренних органов. Результаты механического воздействия аппарата на ПДС в сочетании с релаксационным действием биотоков на организм выражаются в улучшении самочувствия, уменьшения болевых ощущений и снижения уровня нервно-психического напряжения.
3. Разработанная методика аппаратного разгрузки паравертебральных мышц, обеспечивая снятие болевого синдрома вертеброгенного и миофасциального происхождения способствует профилактики двигательных и вегетативных расстройств в сочетании со специальными физическими упражнениями.

■ *профессионально рецензируемых*

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Muscle pain syndrome elimination and spine correction by Corden (Cordus) device

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(English version of the previous Russian article)

Summary

The aim of this research to assess the efficiency of device-assisted osteopathic relief of paravertebral muscles, combined with correction of functional state of the nervous system by means of Corden (in some countries Cordus) device. "Corden" – the innovative mechanotherapy device, the design of which allows to plunge into the zone of paravertebral muscles and relax them. Therapeutic sessions were given to 19 patients (9 male patients and 10 female patients) aged between 23 and 65, suffering from various myofascial pain syndrome variants. To eliminate muscle spasm, we resorted to device-assisted relief of spinal segments or functional spinal units (FSUs). The therapy was primarily meant to relax deep-seated muscles that were in a state of hypertonia. Mechanical actions of Corden device on FSUs, combined with relaxing actions of currents on the body, improve health, eliminated pains, and reduce nervous tension.

Keywords

Muscle pain syndrome, Corden device, muscle spasm, relaxing actions of currents

Introduction

Myofascial pain syndrome is among the prime neurological syndromes causing temporary incapacity of work in working-age population. While the underlying causes of myofascial pain syndrome (MPS) may vary, a few of them are the most common. Researchers are inclined to think that muscle injuries that lead to MPS are primarily caused by muscle overloads.

Massage is a popular and common remedy for myofascial pains caused by physical or psycho-emotional strain. Nonetheless, search for innovative efficient ways to eliminate overstrain, pain syndromes, and nervous system disorders remains a topical issue amid present-day sedentary lifestyle and elevated physical strain.

In this connection, it is **the aim** of this research to assess the efficiency of device-assisted relief of paravertebral muscles, combined with correction of functional state of the nervous system by means of Corden device.

Method

Spinal and paravertebral muscle correction Corden unit has been used as a means of device-assisted spinal therapy. "Corden" – the innovative mechanotherapy device, the design of which allows to plunge into the zone of paravertebral muscles and relax them. In Corden modulated action currents, which allow for changing the functional state of the nervous system in the direction of relaxation, that have anti-stress effect (Fig. 1, Fig. 2). The procedure of correcting the spine and tonus of the invertebral muscles consisted in placing the patient in the prone position with the Corden device under the desired segment in the cervical, thoracic and lumbar spine, i. e. the apparatus was placed along the central energy channel of the body (sushumna). After a 30-minute correction, the patient performed several traction and mobilization exercises to mobilize the vertebrae and strengthen the muscular corset of the back.

Therapeutic sessions were given at the Physical Therapy Department of the Clinical Hospital of the

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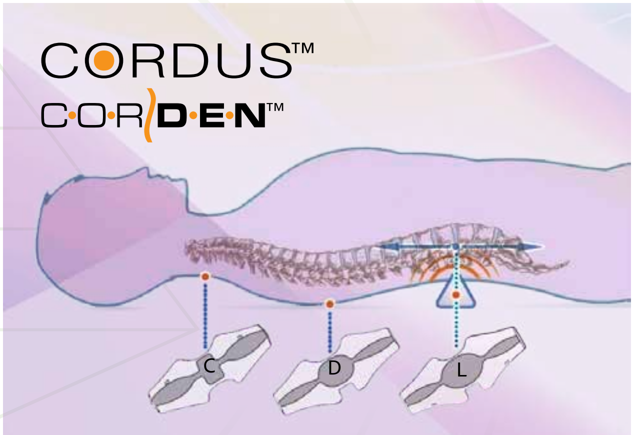
Russian Academy of Science, a federal state-run budgetary healthcare institution of Saint Petersburg to 19 patients (9 male patients and 10 female patients) aged between 23 and 65, suffering from various myofascial pain syndrome variants. Prior to the test, physical therapists were instructed on the properties, the operation, and the proper usage of the unit. The session included 12 procedures per patient, and consisted of Corden spinal relief and a set of exercises to mobilize spinal motion segments.

Patients selected for the session were interviewed and their informed consents were obtained. Quantitative assessment of pain was performed using a visual analog scale (VAS).[1] By the method of VAS on a straight line 10 cm long, the patient marks the intensity of pain. The beginning of the line on the left corresponds to the absence of pain (0), the end of the segment on the right is intolerable pain (10). The patient should indicate the intensity of the pain, knowing that zero corresponds to the absence of pain, and the final digit of the scale is the maximum pain that the patient has ever experienced.

Psycho-functional status of the patients was assessed by Eysenck neuroticism test (emotional instability) and Nemchin's neuro-psychic tension (NPT) questionnaire. Eysenck's test by definition of neurotism contains 57 questions, responding to which the level of stress resistance is determined. Questionnaire of T. A. Nemchin is a list of signs of neuropsychic tension, compiled from the data of clinical and psychological observation, and contains 30 basic characteristics of this condition, divided into three degrees of severity. The minimum number of points a test subject can gain is 30, and the maximum is 90. Typically, in persons with severe pain syndromes, the NPT level is more than 45 points. A decrease of this indicator will indicate an improvement in the patient's condition after the course of therapy.

Fig. 1. The Corden (Cordus) device

Fig. 2. The mechanism of action of the device Corden (Cordus)



Research findings

The patients were given a therapeutical session to correct the posture and functional status of the nervous system (NS) and to eliminate pain syndrome. Psychological tests done after the session suggested that the patients given a Corden unit session provided significantly lower neuroticism values, compared to the reference values they had had before the osteopathic spinal relief session (see Tab. 1). That could indicate that the patients in question had developed higher emotional stability, which contributed to maintaining organized behaviour, plus good adaptive situational purposefulness in both normal and stressful situations, following elimination of pain syndrome and onset of the state of relaxation.[17] Higher neuroticism values that the patients had had before the correction session indicated that they had been maladaptive and less resistant to stressful situations. According to N. D. Nenenko individuals with low neuroticism had stomachs more resistant to stresses in terms of both secretory and immune functions than individuals with high neuroticism did.

The patients also had significantly lower NPT values after a Corden session to correct the posture and functional status of the nervous system (NS) (see Tab. 1). Moreover, the questionnaire suggested that the patients that had been given a session had very few or no complaints about any physical or psychological discomfort, with the overwhelming majority of the patients selecting questionnaire points that were indicative of an absence of previous discomforts of somatic or psychical nature.

When some spasmodic muscles relaxed, ⅓ of the patients recalled various emotional experiences that were “frozen” in these tensed muscles. After such catharsis, the patients became psychologically significantly better, and the muscles of this segment relaxed.

Tab. 1. Test results for the patients with spinal pain syndrome, aged between 23 and 65, before and after a Corden unit session

	Name	NPT, points	Neuroticism	NPT, points	Neuroticism	Estimation of pain before the correction course	Estimation pain after the correction course
1	Sh-va	50	16	49	12	8	5
2	T-ak	49	14	41	8	7	4
3	M-va	47	15	42	9	8	4
4	V-na	50	14	44	11	7	5
5	K-ev	54	19	42	11	7	4
6	K-iy	47	15	45	9	9	5
7	K-ov	47	14	41	8	8	3
8	K-in	49	11	41	8	7	4
9	N-in	51	15	45	11	7	3
10	N-ko	53	13	46	9	6	2
11	M-na	48	12	44	8	7	2
12	Kh-va	46	13	41	10	6	5
13	M-ev	47	16	43	12	8	4
14	S-ko	51	15	40	9	7	3
15	R-ev	48	13	44	11	6	3
16	T-ov	46	12	43	9	7	4
17	Sh-va	49	14	44	10	5	2
18	Sh-na	45	11	41	8	6	2
19	Ya-in	47	13	43	9	6	1
	M ± m	48.7 ± 2.8	14.5 ± 2.9	***42.6 ± 2.9**	***9.6 ± 3.7**	6.9 ± 1.8	**3.2* ± 1.4**

Note: * denotes significant differences from the reference values; NPT – neuro-psychic tension.

Almost all of the patients had normalized sleep, increased workability, and significant reductions in painful sensations (see Tab. 2). Quantification of pain showed a significant decrease in the severity of pain or even its disappearance after spending correction course (Tab. 1). So patients before the corrective course had a high average severity of pain syndrome of 6.9 ± 1.8 points, and after the course of correction of the spine the pain level became significantly less than 3.2 ± 1.4. These indicators indicate that in the majority of subjects the pain almost disappeared.

The patients experienced reduced feelings of tightness in the cervical, thoracic, and lumbar regions, and had improved mobility of arms and legs, normalized cardiac activity, genitourinary system function, and a healthy appetite. Moreover, they had no more headaches, pins and needles in the liver area; and reduced tension in the back and epigastria contributed to improved postures. The majority of subjects felt "energy flows" (in the form of heat, tingling and pulsation), walking along the spine to the feet.

Tab. 2. Clinical effect of the spinal correction by device Corden on pain syndrome sufferers aged between 23 and 65

Patient No	Sex and age	Diagnosis	Clinical effect
1.	F, 56	Lower back pains	Pain syndrome relief
2	M, 48	Shoulder epicondylitis	Pain syndrome relief
3	F, 45	Scapulohumeral periarthritis	Pain syndrome relief and improved joint mobility
4	M, 62	Scapulohumeral periarthritis	Improved joint mobility
5	M, 43	Neck pains	Pain syndrome relief
6	F, 37	Lower back pains	Pain syndrome relief
7	F, 49	Tension headaches	Pain syndrome and epigastric tension relief
8	F, 32	Degenerative disc disease accompanied with lower back radicular pains	No pronounced effect
9	F, 28	Kyphoscoliosis and thoracic pains	Pain syndrome relief, reduced pins and needles in the liver
10	F, 39	Scoliosis and thoracic pains	Pain syndrome relief
11	F, 40	Lower back pains	Pain syndrome relief
12	M, 54	Thoracic pains	No pronounced effect
13	F, 45	Degenerative disc disease accompanied with lower back radicular pains	Pain syndrome relief
14	M, 47	Degenerative disc disease accompanied with lower back radicular pains	Pain syndrome relief
15	F, 66	Stroke rehabilitation; right arm paresis	Improved mobility of arm
16	M, 65	Neck pains and backaches caused by occupational muscle tension	Weakly positive effect
18	F, 33	Asthenic syndrome	Improved overall health
19	M, 30	Asthenic syndrome	Improved health

Discussion

It is our theory that backaches that the patients in question had were caused by pain impulses coming from both injured spinal tissues and close structures to the spine: joints, articulations, body organs, skin, ligaments, and muscles – both paravertebral and extra-vertebral. Ligaments, muscles, periostea over processes, disc protrusions, and intervertebral discs could be sources of pain in the vertebral motion segment. All nociceptive impulses were sent to the CNS, regardless of their sources. At the same time, pain impulses activated alpha- and beta-motor neurons in the anterior horns of the spinal cord. Activation of anterior motor neurons caused hypertonia of muscles innervated from the spinal cord segment in question.

MPS is commonly believed to be triggered by constant or repeated low-level muscle contractions,[7][11] maximal and submaximal concentric muscle contractions, and long tensions in individual muscle groups- overstrain body posture in hypodynamia.[4][18]

Some researchers[5][13][14][15] make a point that stimulation of nociceptors of the very muscle occurs when muscular spam takes place. Hyperaemia develops in spasm-ridden muscles, which increases activation of nociceptros in the muscle tissue. A spasm-ridden muscle becomes a source of extra nociceptive impulses that are sent to cells of the posterior horns of the same spinal cord segment. Accordingly, an increased pain impulse flow increases the activity of anterior motor neurons, which, in turn, increases muscle spasm, forming a vicious circle of **pain – muscle spasm – increased pain – increased muscle spasm.**

Physical body state in individuals that either prone to overstrain or lead a sedentary may be improved though both manual and device-assisted methods.[2][8][9][12]

To eliminate muscle spasm, we resorted to device-assisted relief of spinal segments or functional spinal units (FSUs). The therapy was primarily meant to relax deep-seated muscles that were in a state of hypertonia. Relaxation was manifested by improved mobility of the FSUs. It was one of the top-priority tasks of supportive locomotive apparatus rehabilitation sessions to restore mobility of FSUs.

The relief and the treatment of the spine took place when conic protrusions of the unit pressed on a muscle group of a FSU, located between transversal processes of vertebrae, under a patient's body weight, relaxing those muscles to an extent when a local traction between the vertebrae was possible. That, in turn, caused extension of the ligamentous apparatus of a FSU,[6] while slow-frequency modulation currents generated by the unit contributed to onset of relaxation.

When the patient's body weight pressed on the unit, the patient was able to feel the pain, to concentrate on it and to feel it clear away due to acupressure. We applied a relaxation technique that worked to eliminate pain of the body and the mind, to restore mobility of FSUs, and to reduce anxiety and discomfort.

The research findings (see Tab. 2) suggest that device-assisted therapy of FSUs not only eliminated backaches, but also restored mobility of the major and the most vulnerable joints, including the shoulder joints and the pelvic joints.

The research indicates that Corden unit paravertebral muscle correction has proved effective on most patients, provided that the unit is applied by properly trained staff and in the absence of contraindications in the patients. At the same time, patients feel a change in their psycho-energy state, manifested in activation of the body's energy, forming a sense of calm and deep relaxation. In this connection, the device can be used for acupuncture in the channels along the spine.

Conclusions

1. The device acts on both spinal segments and spinal joints to alleviate back extensors and eliminate blocks in spinal FSUs, which reduces or even eliminates pains.
2. Corden device acts deeply on the paravertebral areas that overlap meridian channels and reflex areas through which body organs are regulated. Mechanical actions of Corden device on FSUs, combined with relaxing actions of currents on the body, improve health, eliminated pains, and reduce nervous tension.
3. The designed method to relieve paravertebral muscles eliminates vertebrogenic and myofascial pain syndrome, and contributes to prevention of movement disorders and vegetative symptoms that may appear in further physical exercises to build up pectoral girdle.

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The Acupuncture on Basis of IFI DES-M – Infointeractional Diagnostic of Elements – M

Mochnáč, T.

Abstract

The author in this pilot study refers about the new methodology in acupuncture diagnostic on the basis IFIDES-M-info-interactional diagnostic. The essence is the bio-diagnostic method of examination of the organism like the open system in energy-informational level. The therapy based on a new treatment model in acupuncture Teo Mo time hexagram sequence. Results of treatment are confirmed not only by results of the clinical improvement, by TST (tactile Solar's test) examination but by the instrumental examination using the IDS-M (impedance data system – M) too. The obtained results, the success rate treatment on the basis IFIDES-M (info-interactional diagnostic of elements) in 93.9 % confirmed by TST in a group 246 examination and **the prediction success rate of the treatment 88.6 %** confirmed by instrumental examination IDS-M in a group of 44 examination are the evidence of the justness using this methodology in natural medicine.

Keywords

IFIDES-M (info-interactional diagnostic of elements), wave function, the acupuncture diagnosis

When we talk about IFIDES-M we talk about the relationship to the energy-informational level. This term means the relationship to the functions of the psycho-regulation level like the thinking and the consciousness. Both functions defined like material categories. It is the relationship between two systems, the physician and the patient. We used these categories in our study in the diagnostics. I repeat some basic conclusions of articles concerning of the psychic and consciousness. Cognitive systems are very complex informational systems where must be applied laws of the quantum mechanics of systems. Wave functions of the quantum mechanics represent mental object.[1] This concept we can not to change with the estimation of the wave function. This function stays unknown. This function is observed in itself and cannot by measurable.

The quantum state (the wave function) is a vector in the Hilbert space "H" on the some field. I.e. the quantum condition is such as element and represents a vector. 5 elements are a set of vectors (elements of the set), and they are a vectors space over some field. These elements of the field we call mathematically the scalar too. This state has the probability content. This content expresses about the wave functions superposition, which we can influence.

The first is the concept of the **EI status** of (energy-informational status) – under which we understand the dynamic expression of systems depending on their mutual internal and external interactions. We can say that the system is in term of the space-time in some EI state, which we called the element. Or the quality of the systems potency is determined by the characteristics of the EI status or element, i. e. their functional potency to any kind of function.

The meridian concept of the acupuncture is based on the course of acupuncture pathways, its connections with the other meridians and on the meridian function to influence other meridians. According to this concept, it follows that meridians are hierarchically above the acupuncture points. The acupuncture meridian according to our definition is the relationship, interaction, between two or more points. The points we have defined as the **energy-informational structure.** This means that its essence is material and the point owns some information characteristic. The idea of a block on the acupuncture meridian goes out the practice. It may be correct from the point of view that we use in the treatment the method of the bypass or bridge

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of the meridian in the course of the disorder of the meridian potency growth.[6]

The question arises whether the meridian is a relationship between two points or it is the consensual structure (the existing Canal) that connects points and which has the characteristics of the yin, yang or element. But the therapeutic intervention is carrying out mechanically, mentally through the points. The intervention does not carry out through the meridian projection. Some authors refer the fact that the meridian well leads the ultrasound, electromagnetic waves and the radiation. Therefore the imagination is, that the meridian is a channel. However, these physical effects of above mentioned spread not linear but in the form of "balls". Then there is onsite the right idea not only of channels but also on **energy-informational networks.**[12]

Because Qi, which is essentially a particular piece of the information, does not flow but it has "IS". Block on the meridian, in front of which something is piling up, in such a manner may be explain by the information influence, by the potency point, which stimulates the somatic symptom such as fullness, hotness, coldness and so forth. Another is the concept of an element, such as a attractor, which is the route to the balance state. This is a dynamic information category, it can be said the program, which provides the harmonic, bounded structure function.

The essence of the info-interactive diagnosis is the way to obtain the information without any mechanical contact with the patient at any distance from it. It is the way in which we can influence the energy-informational, bio-morphological and psycho-regulatory levels. Physically this way cannot be explained on the basis of previously known elementary particle characteristics or interactions (forces).

Many authors consider **the material substance of the information.**[2][13] Some authors define it indirectly, via its manifestations.[12] In general, are used properties of the information in the telepathy, in the mental acupuncture and in the case of energy-informational effects such as described by Rosinsky, T. and Solar, G.[11]

We work in the energy-informational level in the acupuncture. It follows from the characteristic of the acupuncture points and microsystems, which we define like energy-informational structures or states.

In natural medicine, therefore, also use information obtained by the info-interactional method from the patient (EIS), which will turn to us for help. The methodology of the IFIS DES-M (info-interactional diagnostics of elements – M) is based on the distance diagnosis of the general pentagram state of the patient, what is EI system (EIS). I. e. we are entering to the observations (mapping) of each element qualities (a certain dynamic wave function) in a patient. This condition we can image in the form of weighting diagram. It is the patients imaging of the current energy-informational state. So we capture the movement of the energy-informational status at some point in the time, which you can interpret. The weighting diagram is compatible of his expression with the TST and IDS-M.[7]

The first, we determine the quantitative characteristics of the element, if it has a high, normal or low potency. We determine the highest gradient of the weighting diagram between Wenn's diagram elements. On the basis of the Teo Mo time hexagram sequence characteristics we choose the acupuncture point.[8]

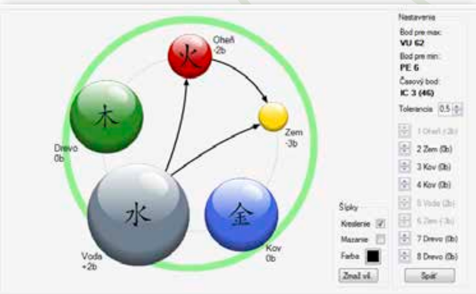
Then we adjust quantitative characteristics of elements in the weighting diagram RmKM using the relevant characteristic **of the element** and **the interaction.** Then we determine the assumption of the quantitative characteristics of the RmKM. The expected state we verify by measuring of the skin electrical conductivity 7 days after therapy in RmKM.[5]

For the purpose of this work, we have defined the skin electrical conductivity level as a bio-morphological level, which are partly refers about the energy-informational status. TST DS-M we have defined like bio-morphological level and in addition, the IFI DES-M (info-interactional diagnostics of elements – M) as the only **information category,** where we meet with info-interactional phenomena. **The information category** we define as a non-local (it is everywhere) and no-time (we get it right now), which corresponds to the characteristics of the wave function of the phenomenon. We can define it as a level because the level is characterized by the location in the space and the time.

At the same time, we assume that the energy-informational state (element) can be determined just in this way. The dynamics vanishes observing the event. We can quantify this state at the time. The wave function becomes a quantum phenomenon, because we observe it, we are doing the diagnosis.

In this respect, we therefore also methodically followed so that the patient, we have carried out examinations in the each level. TST (tactile Solar's test data system – M) evaluates the bio-morphological level with all its relations (interactions), we can define. They are compatible with interactions in the IDS-M as well as in the IFI DES-M (info-interactional diagnostic of elements – M). On the basis of the IFIDES we influence RmKM of the IDS-M with using the Teo Mo time hexagram sequence model.

Fig. 1. The example of a IFIDES-M (infointeractional diagnostics of elements – M), where with a metal characteristic of the acupuncture point LI-3 we refine the quality hyperkinetic dekoncentrated triplex interaction (the quality hyperkompositional turbulent algorithm according to Solar). *Application print-screen*



The Aim of the Study

1. To confirm the possibility of affecting the EI level expressed graphically in RmKM (the regime of the extraordinary vessels points or complex meridians) in IDS-M (Impedance data system – M), when we use the information collected by IFIDES-M (info-interactional diagnosis of elements – M).
2. To evaluate the incidence of interactions in our group of patients
3. To assess the immediate success rate of the treatment certified by TST
4. To evaluate the prediction success rate of the treatment by such a methodology

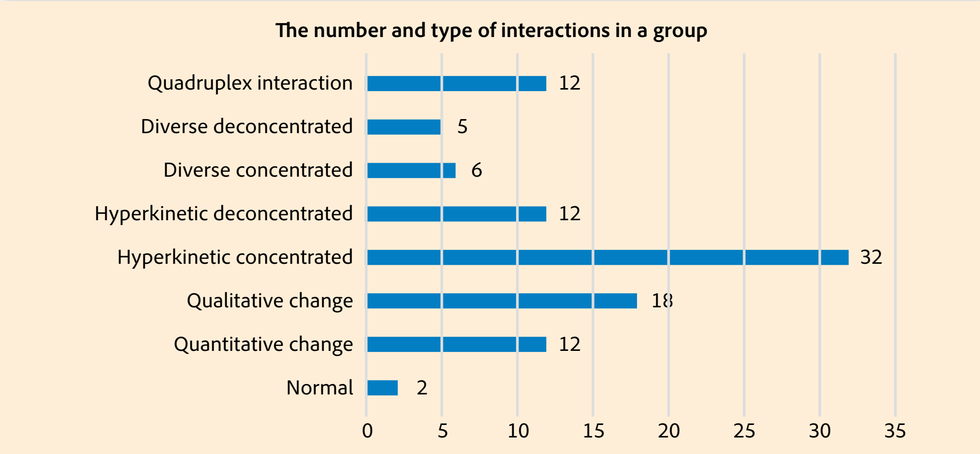
Methodology

The energy-informational patient's condition (the acupuncture diagnosis) we defined on the basis IFIDES-M (the info-interactional diagnostics of elements – M). We choose elements characteristics and the necessary interaction, which we use to treat. We verify the predicted state by measuring the electrical conductivity of the skin after 7 days in RmKM (the regime of the extraordinary vessels points or complex meridians). According to IFIDES-M methodology we realised 246 examinations in 49 patients. We included 30 patients to the monitored group, in which we verified the IFIDES-M methodology using the IDS-M in 44 examinations.

Results

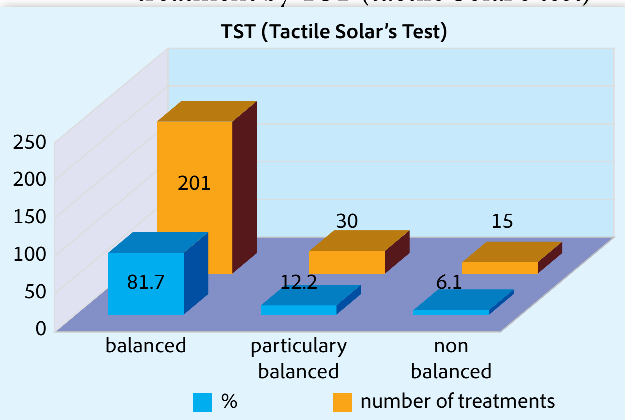
In a group of patients in 44 tests, we have seen the highest incidence of THK (the hyperkinetic concentrated triplex interaction) and the low incidence of quadruple and pentacle interactions in 32.3 % (12.1 %).

Fig. 2. The number and type of interactions in a group



The success rate treatment in the group of 246 examinations represents 93.9 %. It is verified by the TST examination.

Fig. 3. The objectification of the success rate treatment by TST (tactile Solar's test)



The prediction success rate of the treatment (PST) is the criterion by which we define the expected outcome of the therapy.

The prediction success rate of the treatment (PST) means that on the basis of the weighting diagram of RmKM and TST we change all three, four or five elements according to our ideas, using one ancient point, defined according to IFIDES-M. The result is controlled after 7 days by the instrumental examination in RmKM (the regime of the extraordinary vessels points or complex meridians) of IDS-M (impedance data system – M).

The control relationship of the Level III, IV and V are characteristics, which are applied in the evaluation of therapy, for the purpose of affecting all elements in pentagram. This means that after therapy with a certain element characteristic and interaction, it is accomplished an expected change at least of 3, 4, or 5 elements in pentagram. The overall prediction success rate of the treatment in a group of 44 patients is 88.6 %. The obtained result was confirmed after 7 days by the electrical skin conductivity examination IDS-M (impedance data system – M).

Fig. 4. The overall prediction success rate of the treatment (PST) in a group

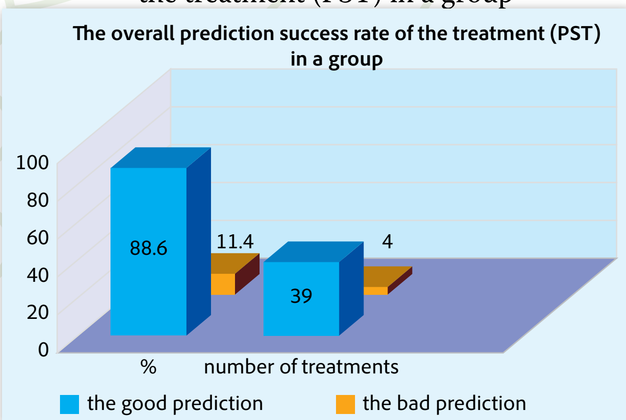
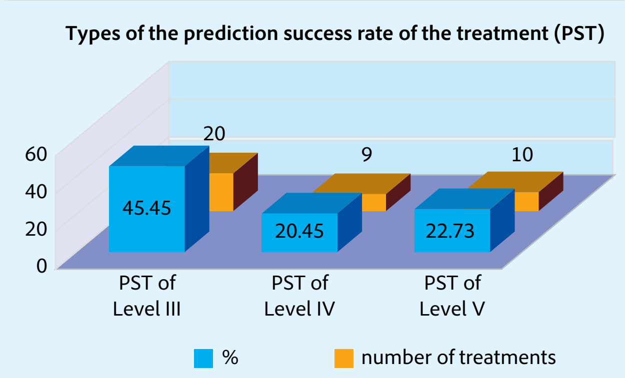


Fig. 5. Types of the prediction success rate of the treatment (PST)



Discussion

The info-interactional diagnostic (previously called incorrectly bio-diagnostic) and therapy are methodologies that are all commonly used in the process of creating the acupuncture diagnosis and treatment. Many doctors just "materialistic mind-set of" do not even realize that they use such procedure. It is a question of interaction of the therapist and the patient at the level of psycho-regulatory and energy-informational level. In the routine medical practice are not known knowledge from research and quantum physics and psycho-regulation level, which fit into each other very well.[1][2][3][4][9][10] The info-interactional diagnostic is a part of the natural medicine concept. It belongs to the repertoire of the acupuncture.

Presented study is the first that tries to confirm the old concepts used in acupuncture. The author is trying to prove the reality of the of the processes taking place between elements. Features and ideas described by old authors discussed and downloaded from author to author, are just characteristics of the elements and the relationships between them, over which the few who intends to. The presented methodology should be attempting to prove the reality of the operation of such categories. Of course, that another study of these laws to a more detailed description help us to define new relations, by means of which we can clarify the situation more closely.[8][14][15]

The aim of the work was to confirm the reality for example the control relationship between elements. An important result is that the distance diagnostics without physical contact with the patient is the real way that we can, after careful preparation of your workout, use in the treatment. The whole process takes place in the psycho-regulation and energy informational levels and the function of the consciousness has the quantum essence. The legitimacy of this claim is confirmed by some works.[3]

Position of the methodology in such research is therefore very important and puts it to the fore partly because it actually is a kind of a fair basis for confirmation of rules of functioning of the mass. The instrumental examination before treatment and after it allows us to create a picture about dynamic of the process and thus to consider about the physiology in the energy-informational level. We can quantify it and to conclude about its qualities. It pushes us further and allows you to move not only diagnosis but also therapy into the info-interactional level.

The results of this pilot study confirm the success of such an approach. **The prediction success rate of the treatment** is an important new term that we introduce and points out just on the prediction, we can say that the process is going to evolve in the direction that it is identified. This prediction based on the results of this study is very invigorating to 82 %. It confirmed the legitimacy of the use of the diagnosis based on the hexagram sequence, the ancient knowledge of the events described in the book Yi-Jing.

Conclusion

On the group of 246 examinations we confirm the success rate of treatment on the basis IFIDES-M in 93.9 % verified by the TST examination. A very important result is that **the prediction success rate of the treatment is 88.6 %** verified by the instrumental examination IDS-M (impedance data system -M). IFIDES-M (Info-interaction diagnostics of elements) is a methodology that can be classified as a diagnostic methodology of natural medicine.

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Endogenous Oestrogen as a Possible Risk Factor for Breast Carcinoma Genesis

Slobodníková, J.; Meluš V.; Krajčovičová, Z.; Kašlíková, K.

Abstract

In my work is summarized knowledge about oestrogen and its role in the aetiology of breast cancer. Findings about oestrogen released from adipose tissue are also involved. The goal of this work is to clarify those mechanisms and to explain laboratory diagnostics of estradiol level estimates. A better understanding of the role of oestrogen as a breast cancer risk will help to more effectively prevent this disease.

Keywords

Endogenous oestrogen, breast carcinoma, abdominal obesity, menopause.

Introduction

Breast carcinoma is the most common oncological disease and the most common cause of death among the female population in developed countries of the world. The exact mechanism and the cause of breast carcinoma genesis have not yet been elucidated, but we know of many partial actors and other factors that have been determined by the statistical results of a number of observational studies. Endogenous oestrogen belongs among them and our presentation is dedicated to it.

Incidence of Malignant Breast Tumour in Women

The number of new cases of breast carcinoma over a certain time period, i.e. the incidence, rises steadily. The overwhelming majority, nearly 70 % of malignant tumours, affects women over 50 years of age. According to the data acquired,[1] for example, 209,060 new cases of the disease were solely in the US detected in 2010. In 2008, a total of 1,384,155 women were affected with breast carcinoma worldwide. In Slovakia, about 2,600–2,800 new cases are diagnosed every year, while about 700 – 800 women die. In relation to age, it is most common between the ages of 55 and 65.

In the case of breasts, almost all metabolic processes and signalling pathways in the breast are influenced by hormones – commonly known as oestrogen, progesterone, prolactin, and corticoids. Due to their lipophilic nature, oestrogens can easily enter the cell. Due to their ability to bind to intracellular receptors as a hormone-receptor complex, oestrogens bind to specific areas of chromatin or DNA. This induces changes in the rate of transcription of specific genes. By interactions of the hormones mentioned above with the breast epithelium-mesenchyme system, neoplastic processes are initiated by alteration of genotype, genetic instability, and a specifically linked gene expression under the control of the microenvironment, the stroma and the immune system of the breast.

Tissue Microenvironment of the Breast and Carcinogenesis Onset

A normally functioning tissue microenvironment of the breast is, on the one hand, able to eliminate malignant cell formation, and, on the other hand, be a predisposition of such a condition due to a failure of its signalling. Invasive breast carcinoma is the terminal point of the development process. This process begins in the **TDLU (terminal ductal lobular unit)** of the breast and it is assumed to be composed of several interlocked stages. There are increases in the level of atypia, mobility and cell proliferation, along with a gradual acquisition of the conditions for stromal invasion and metastatic proliferation.

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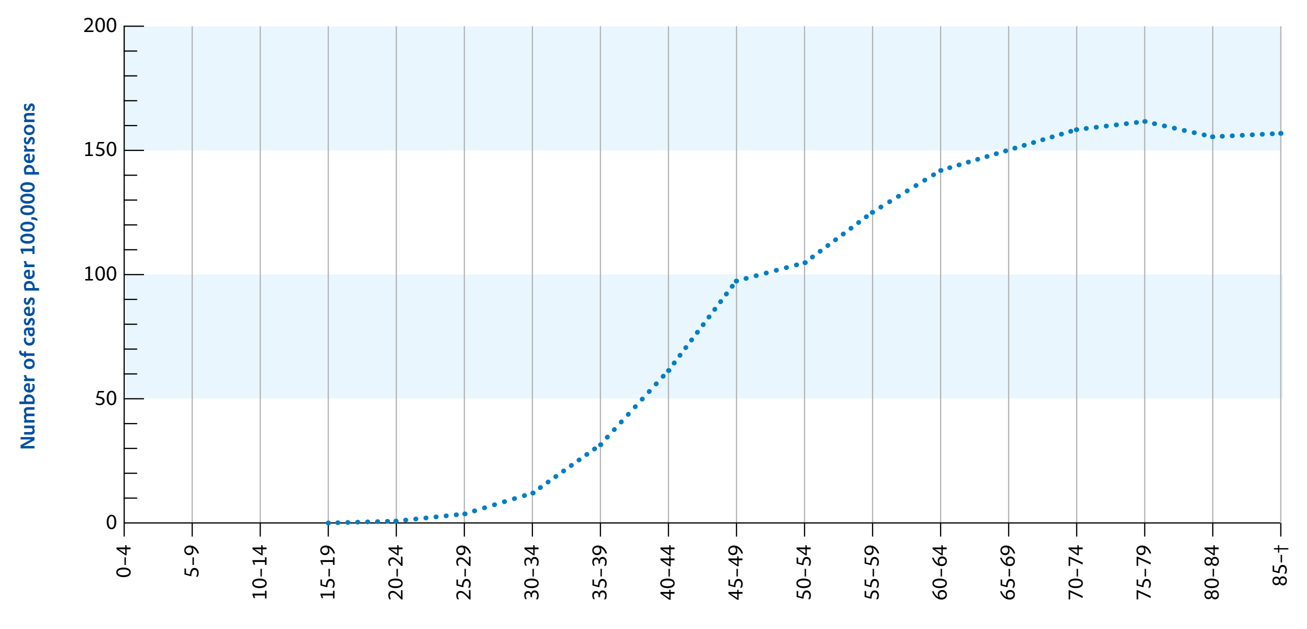
Department of Laboratory and Examination Methods in Health Care

Fig. 1. Incidence of malignant breast tumour by age at the time of diagnosis



C50 – Malignant breast tumour – incidence among women age structure of the patient population

The Impact of Tissue Microenvironment on DCIS (Ductal Carcinoma in Situ) Development into an Invasive Form

One of the methods is a barrier leakage, which is characterized by the fact that tumour epithelial cells locally disrupt the myoepithelial cell line, degrade the basal membrane and then escape into the surrounding stroma. Another method is a barrier failure; its specificity is that the myoepithelial cell layer and the basal membrane are damaged all at once as a single unit. Massive leukocyte infiltration and an accumulation of myofibroblasts are also present. Tumour cells penetrate into the surrounding stroma and gradually reach distant organs.

Oestrogen and Its Derivates, Oestrogen Receptors

The highest level of oestrogen is achieved during the productive age of a woman, however, paradoxically; the highest risk of breast cancer caused by oestrogen is present during menopause, when this level is the lowest. In the presentation, we deal with possible mechanisms of both oestrogen production and release despite the absence of activity of its primary source (ovaries). The aim is to summarize findings of worldwide studies that are not uniform in their conclusion as to whether oestrogen in postmenopausal women appears only due to the peripheral aromatization of oestrogen in fatty tissue. If so, it would point to a direct link between abdominal obesity in postmenopausal women and the risk of carcinoma development.

Fig. 2. Oestrogen – chemical formula

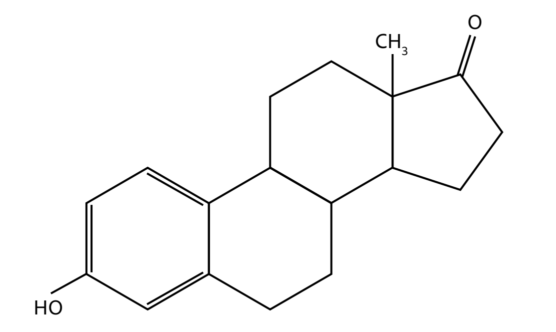
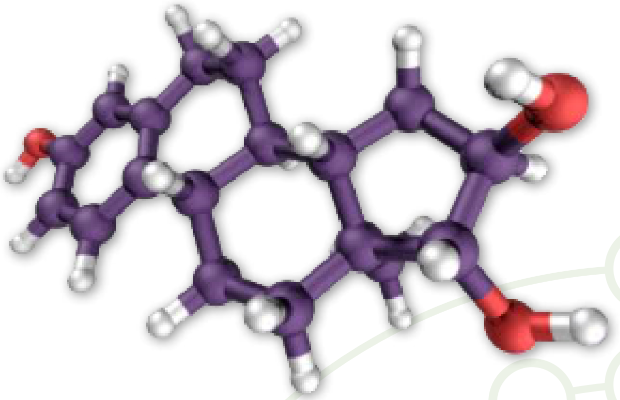


Fig. 3. Oestrogen – molecular scheme



Oestrogens are hormones that are important for sexual and reproductive development, especially in women; therefore, the term, female sex hormones, is used. Oestrogen (Fig. 2, Fig. 3) is produced by the ovaries and, in small quantities, by the adrenal cortex. The major natural hormone of the ovarian follicles is 17β-estradiol. Oestrogens play a role in the growth and development of female secondary sex characteristics, such as the milk glands, and serve to regulate the menstrual cycle and the reproductive system.

In the ovulation cycle of a woman, hormones play the role of chemical messengers. Oestrogen is secreted into blood, where it moves along and integrates with the cells in various target tissues, where it passes the message to them. It regulates the menstrual cycle and regulates the growth of the uterine lining in the first part of the cycle. When fertilization does not occur, the oestrogen level drops sharply and menstruation begins. If egg fertilization occurs, oestrogen interacts with progesterone and other hormones to stop ovulation during pregnancy. Furthermore, oestrogens increase the growth of long bones in puberty, affect fat distribution in the body in a typical female form, and, in higher doses, stimulate pigmentation of the yards and nipples as well as the genital area. In humans, oestrogens also affect libido and trigger oedemas by pushing intravascular fluid into the extravascular space, followed by a decrease in the plasma volume resulting in compensatory sodium and water retention. They also modulate the activity of the sympathetic nerve system and control the function of the smooth muscles.

From among naturally occurring oestrogens, the most efficient is 17β-estradiol, followed by oestrone, whereas estriol is the least efficient. These substances are steroids with 18 carbons, hydroxy- or keto-group on the C_{17} carbon and with the phenolic A ring. Alkylation on the A ring reduces the binding capacity of the respective substances with the oestrogen receptors. Steroid hormones are synthesized from cholesterol, which in the ovaries is found either free or esterified with fatty acids.

The term oestrogen refers to all chemically similar hormones in this group, which includes oestrone, estradiol and estriol.[2] *Oestrone* is considered to be a weaker form of oestrogen; its chemical name is 3-hydroxyestra-1,3,5 (10)-trien-17-one. The molecular formula is $C_{18}H_{22}O_2$. Oestrone is the least represented of these three hormones; a small amount is found throughout the entire body, especially in fats and muscles. It is the major oestrogenic form, the only one in women in any amount after menopause. *Estradiol* is the most efficient form of oestrogen steroids. Its chemical name is oestra-1,3,5 (10)-triene-3,17-beta-diol and the molecular formula is $C_{18}H_{24}O_2$.[3] It is derived from cholesterol[4] and contributes to most female gynaecological problems, such as endometriosis, myomas, and carcinomas.[3] Estriol is a waste product of estradiol metabolism which may have certain effects on a limited number of oestrogen receptors. Its chemical name is estra-1,3,5 (10)-triene-3,16-alpha,17-beta-triol, and the molecular formula is $C_{18}H_{24}O_3$. A significant amount is only produced by the placenta in pregnancy.[7][8]

The Effect of Oestrogen on Breast Carcinoma Genesis

Oestrogen has a wide range of secondary metabolites. These secondary metabolites affect all oestrogen-sensitive tissues, including the breast. They act on them by stimulating oestrogen receptors (ER), leading to the activation of oestrogen-sensitive DNA genes. These genes are involved in the process of cell growth and proliferation, apoptosis, and carcinogenesis. The mammary gland epithelial cells respond to oestrogens that are produced by aromatase in the fatty tissue, including the stromal component of the breast itself.

Only recently, it has been found that by its oxidative-carcinogenic, genotoxic and mutagenic effects oestrogen metabolites have an effect on the development of a carcinoma; specifically, 4-hydroxyestradiol by activating *ER-alfa* receptors and 4-catecholhydroxysterone by stimulating *ER-beta* receptors.

Histologically normal breast tissue has 10% epithelial cell ER-positivity, whereas in some types of malignant tumours, their number is several times higher. The increased expression of ER-alfa can be considered as a sign of the tumour growth process.

Endogenous Oestrogens in the Postmenopausal Period in Women with Obesity

Obesity

Obesity is known as a risk factor for breast cancer.[5][6] Obesity is one of the major health problems of this century, even in developing countries. The number of obese people is rising dramatically. Published figures on the growth of obesity in the world are alarming and have an increasing trend. It is possible to talk about a pandemic disease in today`s society, and its prevalence doubles almost every 20 years.

Excess weight is referred to the BMI in the range of 25 – 29.9 kg/m^2; we speak about obesity if the BMI is higher than 30 kg/m^2. For example, in 2011, around 40 million children suffered from overweight. Surveys show that in most countries there is no big difference between the number of men and women suffering from obesity. Excess weight is generally the fifth risk factor for the world's deaths. Each year, at least 2.8 million adults die as a result of obesity or overweight. Obesity brings about problems such as diabetes, ischemic and cardiovascular diseases and some types of cancer. In simple terms, the development of obesity is based on the assumption of higher energy intake versus output, resulting in the storage of excess calories in the body fat. This problem is a result of changes in the environment and lifestyle. Of course, hormones that are secreted by enteroendocrine cells[10] also have a role to play.

Obesity in Postmenopausal Women

Obese postmenopausal women have higher plasma oestrogen levels than non-obese due to the transformation of adrenal androgens into oestrogens in fatty tissue. Prior to menopause, most of the oestrogen is produced by ovaries, and fatty tissue produces only a small amount of it. However, after the menopause, ovaries stop producing oestrogen, and, thus, most of the oestrogen originates in the fatty tissue. With a higher fat content, the chance of developing breast cancer increases due to an increase in oestrogen levels. Overweight women also have higher insulin levels, which is associated with some types of carcinoma, including breast carcinoma. It should be taken into account that excess fat in the waist area has a greater impact on the risk of developing breast cancer than the same amount of fat in the area of the hips and thighs.

Observation, Study Results

In women with abdominal obesity, there has been observed an increased risk of post-menopausal carcinoma, whereas this risk has not been observed in the pre-menopausal period. According to the observation of cohort studies, where 495,477 American women were examined during the period of 16 years, there is a strong link between obesity and the risk of breast carcinoma. These studies have shown that in the postmenopausal period the mortality rate of obese women is twice as high in comparison with women with lower BMI. In addition, they also have a higher risk of metastasis in the lymph nodes.

As analyses of 9 prospective studies relating to endogenous hormones and breast carcinoma risk have shown, estradiol, oestrone and oestrone sulphate have been associated with a growing risk of breast carcinoma. Further studies have been carried out with similar results reported. For example, the Nurses' Health Study evaluated a combination of risk with the status of tumour hormone receptors. As expected, stronger relations were manifested between a growing risk of breast carcinoma and rising levels of circulating oestrogens in ER positive tumours.[2]

One of the proofs confirming the role of oestrogen related with obesity on breast carcinoma genesis is that circulating levels of oestrogen are directly proportional to the amount of fatty tissue in post-menopausal women, but this correlation cannot be seen in obese women in the pre-menopausal period.

Oestrogen biosynthesis is catalysed by both the CYP19 gene product and the aromatase enzyme. This catalyses the A ring aromatization of C_{19} androgens to the phenolic A ring of C_{18} oestrogens.[9] For androgens, although we still do not have exact evidence, they are believed to increase the risk of breast cancer either directly by increasing cell growth and proliferation or indirectly by changing them to oestrogen.

After menopause, the main source of oestrogen production is the fatty tissue of the breasts, abdomen, buttocks and thighs, which suggests that obese postmenopausal women have more endogenous oestrogen than slim women and, therefore, also a higher breast cancer risk.

Discussion

The topic of breast carcinoma and its etiopathogenesis and the possible influence of factors should be constantly studied. This work includes as much knowledge as possible from various studies, but it is still not easy at all to clarify this issue. In research, great attention has been paid to the study of breast carcinoma, yet the exact mechanism of its origin has still not been clarified. However, many risk factors are known, with abdominal obesity being one of the most important ones. It causes the release of endogenous oestrogens and other health complications. Therefore, it is of utmost importance to understand the link between obesity in postmenopausal women and breast carcinoma genesis, with a special focus on risk patients of 50 – 70 years of age. Care should be taken in informing older people to understand the importance of regular pre-screenings and the importance of a healthy lifestyle.

It is also important to address the global problem of obesity.[11] The number of obese people is growing year by year, along with a number of other diseases. This problem is caused by a sedentary lifestyle and, especially, by easy access to fatty unhealthy food.

Studies on oestrogens are not unambiguous in their conclusions. Most of them, however, point to the harmful effects of oestrogens on breast carcinoma. This issue is relatively new; therefore, no clear conclusion has been reached. Many studies are still on-going, so not yet completed.

According to studies which were carried out because of the suspicion of an increased risk of breast carcinoma in patients taking HRT, oestrogen has a significant effect on the development of breast carcinoma. On the basis of these findings, greater attention is now being paid to oestrogen.

It has been manifested that there is a strong interaction between the adipocytes in fatty tissue that convert androgens to oestrogen and carcinoma cells. In obese women, the microenvironment of carcinoma shows a rich availability of lipids from adipocytes supporting the progression of carcinoma in the direction of uncontrolled growth.

As it turns out, obesity significantly increases the risk of breast cancer genesis. In another study, chronic inflammation, insulin resistance, adipocytes and cytokines are also involved in the risk of breast carcinoma genesis in obese patients. Similarly, obesity is associated with the increased risk of recurrence of the disease.

The risk of breast carcinoma is strongly related to several hormonal factors, but the mode of action of endogenous oestrogens is difficult to determine. In order to prevent the development of breast carcinoma, it is necessary to be aware that several studies have proven a link between weight reduction and breast carcinoma risk reduction.

With exact understanding of this link, new therapeutic options could be discovered in the treatment of carcinoma. However, not all studies have come to the same conclusions. For example, a study was conducted to compare oestrone and estradiol levels in fatty tissue. Abdominal fat was obtained from 25 women before menopause and 20 women after menopause without carcinoma. Levels in these tissues were compared with those in women with breast carcinoma. This study concluded that abdominal fat does not significantly contribute to maintaining oestrogen levels in breast tissue with carcinoma.

Post-menopausal obesity is associated with hormonal changes and, therefore, slows down metabolism, resulting in abdominal fatty tissue. The only option for older women to combat such obesity is to adhere to a healthy and active lifestyle. As it is pointed out in the chapter on obesity, it is a civilization-related disease that causes a worldwide problem.

According to one of the statistics, one in ten thousand women dies in Eastern countries, while in the Western countries it is one in ten. On the basis of similar statistics, the term Japanese phenomenon was created. Women in Eastern countries consume soya in its original form, while in the Western countries the consumed soya is modified, i. e. with depleted soya proteins which have a positive effect on the cells of the breast glands.

However, it is important to note that eating habits are also responsible for the higher prevalence of carcinoma in Western countries. This does not only apply to the daily intake of soya, but also of other foodstuffs. While in China and Japan, the diet is mainly composed of rice, soya and seafood, in Europe and America people mainly eat modified meals with high contents of fat, additives and other harmful substances. This difference in diet causes abdominal obesity in women from Western countries. Women living in Eastern countries do not eat foods that are so rich in fat and, therefore, do not suffer from abdominal obesity; consequently, there is not such a high quantity of endogenous oestrogens remaining in their body after menopause. In developed countries, up to two thirds of women suffer from obesity, and they are 30 – 50% more likely to develop post-menopausal breast carcinoma.

On the basis of the Japanese phenomenon, more attention has started to be paid to phytoestrogens. They are similar to 17β-estradiol and are able to bind to oestrogen receptors and, thus, block them. Based on similar studies,[12][13] attention has been paid to chemical prevention in both the prevention and treatment of breast carcinoma. The molecular mechanism of certain substances, such as tamoxifen, is based on the inhibition of cell proliferation and the destruction of genetically damaged cells. Therefore, phytoestrogens those are present in various plants, but only in soya beans in a quantity having a real nutritional value, have begun to be used as HT substitutes. However, more accurate studies are needed to help us fully understand these links and, thus, achieve successful prevention of breast carcinoma.

Conclusion

It follows from the literature and studies that in postmenopausal women the genesis of breast carcinoma is linked with BMI, which is associated with higher oestrogen levels. Therefore, the importance of a healthy lifestyle needs to be reiterated as a prevention of obesity, which causes many health complications, including breast carcinoma. To maintain a slim body and a healthy organism, it is necessary to follow certain principles. In the context of a healthy diet, it is necessary to give preference to organic foods and to avoid refined and modified food, additives, preservatives, and colorants. When preparing meals, using olive oil and maintaining fat levels on 20 – 25% of calorie intake is very healthy. A more appropriate diet comprises plant foods, especially lot of fresh organic vegetables supplemented with legumes, nuts, and fruits. When consuming bread products, it is optimal to choose whole-wheat bread.

In drinking regime, it is advisable to prefer pure drinking water or mineral water. Dietary supplements in the form of antioxidants and vitamins also help a healthy diet. Physical exercise at least two to three times a week should be obvious.

One of the possible methods of successful carcinoma treatment is early detection of the disease, so it is important to regularly undergo preventive examinations and perform frequent self-examination of breasts.

editor reviewed

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Концептуальная модель регенеративной медицины на основе биоматериалов Аллоплант

Галиахметов, Р. Ф.

Резюме

Настоящая статья подготовлена по материалам доклада автора на юбилейном XX Конгрессе «Акупунктура и натуральная медицина» (Словакия, г. Штуров, 2016). Теоретические аспекты фармакопунктуры биоматериалами Аллоплант более подробно изложена в статье «Экспериментальные и клинические основы концепции регенеративной медицины Аллоплант» в журнале «Акупунктура и натуральная медицина» 2015, № 5–6, с. 22–31.
Работа состоит из двух разделов: экспериментальной и клинической. В экспериментальной части на модели ожога роговицы изучалось воздействие биоматериалов Аллоплант на процессы репаративной регенерации при местном (субконъюнктивальном) и акупунктурном (параорбитальном) введении. При этом показано, что как локальное (перилимбальное), так и акупунктурное введение ДБА активирует процессы репаративной регенерации в эпителии и строме роговицы.

Ключевые слова

регенеративная медицина, биоматериалы Аллоплант, ожог роговицы.

Материалы и методы исследования

Выполнены три серии экспериментов. В контрольной серии наносился стандартный химический ожог роговицы без последующего лечения. В первой опытной серии на фоне ожога перилимбально вводился диспергированный биоматериал Аллоплант (ДБА). Во второй опытной серии также после ожога ДБА вводился в параорбитальные акупунктурные точки.

Всех животных выводили из опыта на 3, 7, 14, 30-е сутки. Для гистологического исследования забирали роговицу с прилежащей частью склеры, а также кожу и субдермальные ткани в области введения ДБА.

Результаты

Экспериментальный химический ожог в зоне непосредственного контакта с детергентом у всех животных вызывал грубые патологические изменения — деструкцию эпителия, базальной мембраны и поверхностных слоев собственного вещества роговицы. Глубина поражения достигала 50 мкм. По периферии от этой области на расстоянии, составляющем в среднем 200 мкм, также обнаруживались деструктивные процессы, что позволило нам определить эту область как краевую зону повреждения.

Одним из основных проявлений повреждения роговицы является снижение коэффициента анизотропии (КА), падение которого в наших экспериментах достигало 20 % от нормы на 3-и сутки ($p < 0{,}01$).

На границе с краевой зоной повреждения, на расстоянии до 500 мкм также были выявлены изменения в виде пролиферации кератобластов, макрофагов, лейкоцитов. Эту область мы обозначили как зону реактивных изменений.

И, наконец, в периферических участках роговицы на светооптическом уровне изменений не обнаружено. Следует отметить, что обнаруженные нами гистотопографические зоны при ожоговой травме роговицы в целом соответствуют данным других авторов, изучавших экспериментальное повреждение роговицы (Максимов, И. Б., 1990). Согласно полученным результатам выраженность и динамика репаративных процессов в указанных зонах существенно зависела от серии экспериментов.

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Дискуссия

Обнаруженное в наших экспериментах сходство динамики репаративной регенерации роговицы при перилимбальном введении диспергированного аллогенного биоматериала и воздействие ДБА рефлексогенным путем имеет принципиальное значение, поскольку достижение позитивных результатов по регенерации роговицы путем воздействия на рефлексогенные зоны является более предпочтительным по сравнению с оперативным вмешательством, каковым, по сути, является перилимбальное введение ДБА.

Экспериментальное моделирование химического ожога роговицы приводит к некрозу тканей в контактной зоне с последующим развитием воспалительных процессов. Нарушение структуры собственного вещества роговицы проявляется достоверным снижением коэффициента анизотропии до 44 % от исходного уровня на 7-е сутки. Нормализация переднего эпителия происходит на 14-е сутки эксперимента, а пролиферативная активность эпителиоцитов восстанавливается на 7-е сутки.

Акупунктурное воздействие диспергированным аллогенным биоматериалом оптимизирует механизмы репаративной регенерации роговицы, о чем свидетельствует нормализация митотического индекса на 7-е сутки эксперимента. В эти же сроки достигает нормы экспрессия трансформирующего фактора роста в собственном веществе роговицы, снижая вероятность развития фиброза в зоне химического ожога. Коэффициент анизотропии коллагеновых волокон на 7-е сутки достигает 63% от нормы, отражая динамику восстановления функционально адекватных структур. Таким образом, проведенные экспериментальные исследования показали, что и локальное, и акупунктурное введение аллогенного диспергированного биоматериала является эффективным методом стимуляции репаративных процессов как в строме, так и в эпителии роговицы.

В частности, сравнительный анализ результатов двух серий экспериментов показал, что как перилимбальное введение ДБА, так и его воздействие на рефлексогенные зоны мобилизуют комплекс сосудистых и клеточных реакций, которые проявляются в полиморфной инфильтрации с участием макрофагов и процессами ангиогенеза с последующей резорбцией волокнистого матрикса биоматериала.

Результаты наших исследований по активации акупунктурных точек при введении ДБА опубликованы в отдельных статьях журнала «Акупунктура и натуральная медицина» (№ 1, № 3, № 5–6, 2015).

Метод фармакопунктуры с использованием биоматериалов Аллоплант также продемонстрировал положительные результаты при лечении целого ряда демиелинизирующих заболеваний центральной нервной системы, последствий травм, системных поражениях соединительной ткани и других патологических состояниях.

Заключение

Накопленный клинический опыт в лаборатории рефлексотерапии нашего Центра позволил сформулировать следующие практические рекомендации по использованию инъекционных форм биоматериалов Аллоплант:

– акупунктурное и локальное введение биоматериалов Аллоплант может быть использовано для стимуляции репаративной регенерации различных анатомических структур. Показаниями для фармакопунктуры биоматериалом Аллоплант могут являться поражения периферической нервной системы, в том числе с нарушениями нервно-мышечной проводимости, разнообразная патология органов чувств;
– инъекционная форма биоматериалов Аллоплант, длительно поддерживая локальные сосудистые и клеточные реакции, может использоваться в схеме фармакопунктурной терапии с учетом их пролонгированного эффекта и последующей полной резорбции без явлений фиброза.

Полученные в эксперименте результаты реализованы в клинической практике Всероссийского центра глазной и пластической хирургии и целого ряда клиник традиционной медицины и реабилитации. Следует также отметить, что данная методика фармакопунктуры применяется и как самостоятельный метод лечения независимо от хирургического вмешательства.

К настоящему времени нами накоплен большой клинический материал по применению методов фармакопунктуры биоматериалами Аллоплант при поражениях центральной и периферической нервной системы, опорно-двигательного аппарата, органов пищеварительного тракта, репродуктивной системы, кожных покровов, поражениях сердечнососудистой системы и органов дыхания.

■ *редакционно рецензируемых*

Список литературы

1. **Muldashev, E. R.; Galiyakhmetov, R. F.:** Experimental Justification for Using Dispersed Forms of Allografts in Acupuncture. *Acupuncture and Natural Medicine,* Bratislava, MSNM, 2015 (1), pp. 22–26, ISSN-1339-4703.
2. **Muldashev, E. R.; Nigmatullin, R. T.; Galiyakhmetov, R. F.; Aprelev, A. E.:** Morphological Aspects of Pharmacopuncture by Alloplant Biomaterials, *Acupuncture and Natural Medicine, Bratislava,* MSNM, 2015 (3), pp. 19–24, ISSN-1339-4703.
3. **Мулдашев, Э. Р.; Галияхметов, Р. Ф.:** Экспериментальные и клинические основы концепции регенеративной медицины Аллоплант. *Acupuncture and Natural Medicine,* Bratislava, MSNM, 2015, № 5–6, с. 22–31, ISSN-1339-4703.

Conceptual Model of Regenerative Medicine Based on Alloplant Biomaterials

Galiyakhmetov, R. F.

(English version of the previous Russian article)

Summary

This article is prepared based on the author's report at the 20th anniversary congress "Acupuncture and natural medicine" (Slovakia, Štůrovo, 2016). Theoretical aspects of pharmacopuncture by Alloplant biomaterials are described in more detail in the article "Experimental and clinical bases of the concept of regenerative medicine "Alloplant" in the journal "Acupuncture and natural medicine" 2015, Volume 5–6, pp. 22–31.

The work consists of two sections: experimental and clinical. In the experimental part, the impact of Alloplant biomaterials on the processes of reparative regeneration in local (subconjunctival) and acupuncture (paraorbital) insertion was studied on the corneal burn model. In this case it is shown, that the using of the local (perilimbal) and the acupuncture application DBA activate reparative regeneration processes in the epithelium and the corneal stroma.

Keywords

dispersed Alloplant biomaterial, corneal burn, regeneration

Introduction

When treating urgent corneal lesions various types of biological materials are being used. It was academician Filatov, V. P. in Odessa eye research institute who had actively developed those technologies.

Aim of the Work

It is to compare morphogenetic effect of two methods of Alloplant biomaterial injection insertion, that of local (perilimbal) and acupunctural one.

Material and Methods

Three series of the experiments have been carried out to achieve that goal. A standard chemical corneal burn without a subsequent treatment was inflicted in the control series. In the first experimental series dispersed Alloplant biomaterial (DAB) was perilimbally inserted against the background of the burn. In the second experimental series DAB was inserted into paraorbital acupunctural points also following the burn.

All the animals were sacrificed on the Day 3, 7, 14 and 30. The cornea with the scleral adjacent part as well as the skin and subdural tissues of DAB insertion zone were taken for the histological investigation.

Results

The experimental chemical burn in the zone of the direct contact with the detergent caused rough pathological changes in the animals, namely destruction of epithelium, basal membrane and superficial layers of the corneal proper substance. The affection depth achieved 50 µm. The destructive processes were also revealed along the periphery from that region at the distance equal to 200 µm on the average. It allowed us to specify that region as a marginal zone of the damage. One of the main manifestations of the corneal damage was the reduction of AC which dropped on the Day 3 ($p < 0{,}01$) of our experiment by merely 20 % compared with the standard parameter. Changes in the form of the proliferation of keratoblasts, macrophages and leukocytes were also revealed on the border with the damage marginal zone at the distance up to 500 µm. We designated that region as the zone of reactive changes. Finally we didn't reveal any changes in the corneal peripheral areas at the light optical level. It is necessary to note that in case of the corneal trauma the revealed histotopographic zones corresponded on the whole to the data of other authors who had studied corneal

Radik Fayazovich Galiyakhmetov, M. D., CSc.
Federal State Budgetary Institution "The Russian Eye and Plastic Surgery Centre" of the Russian Federation Health Ministry

experimental damages (Maksimov, I. B., 1990). According to the obtained results, manifestations and dynamics of reparative processes in the specified zones substantially depended upon the experimental series.

Discussion

The revealed similarity of the corneal reparative regeneration dynamics in our experiments, in case of perilimbal insertion of DAB and DAB effect by way of the reflex-genic method was of the fundamental importance since the achievement of positive results on corneal regeneration by the effect upon the reflex-genic zones was more preferable compared with the surgical intervention, which in fact, was a DAB perilimbal insertion. Experimental modelling of the corneal chemical burn resulted in tissue necrosis in the contact zone succeeded by the development of inflammatory processes. The disorder of the corneal proper substance structure was manifested by a reliable reduction of anisotropic coefficient on the Day 7 up to 44 % from the initial level. Normalizing anterior epithelium took place on the Day 14 of the experiment and proliferative activity of epitheliocytes was restored on the Day 7.

DAB acupunctural effect rationalized the mechanisms of the corneal reparative regeneration which was testified by normalizing mitotic index on the Day 7 of the experiment. The transforming growth factor expression in the corneal proper substance achieved its standard parameter within the same period reducing the probability of fibrosis development in the zone of the chemical burn. Anisotropic coefficient of collagen fibres achieved 63 % of the standard parameter on the Day 7 reflecting the restoration dynamics of the functionally adequate structures. The carried out experimental investigations showed that both local and acupunctural DAB insertion had been an effective stimulation method of reparative processes both in the stroma and corneal epithelium. A comparative analysis of two experimental series showed, in particular, that both DAB perilimbal insertion and its effect mobilized a complex of vascular and cellular reactions which were evident as a polymorphous infiltration involving macrophages and angiogenesis processes with subsequent resorption of the fibrous biomaterial matrix. The results of our investigations on activation of acupunctural points, when DAB inserting, were published in the journal "Acupuncture and Natural Medicine" (No. 1, 3, 2015). The pharmacopuncture method with Alloplant biomaterial have also showed positive results in the treatment of a number of demyelinating diseases of the central nervous system, consequences of traumas, systemic lesions of connective tissue and other pathological states.

Conclusion

Experience gained in our Centre's reflex-therapy laboratory made it possible to suggest the following practical recommendations of using Alloplant biomaterial injection forms:

- acupunctural and local Alloplant biomaterial insertion may be used to stimulate reparative regeneration of different anatomical structures. The lesions of the peripheral nervous system as well as disorders of the neuromuscular condition, various pathologies of sense organs could be indications for Alloplant biomaterial pharmacopunture;
- injectional form of Alloplant biomaterials maintaining local vascular and cellular reactions for a long period of time may be used in pharmacopunctural therapy taking into account their prolonged effect and subsequent full resorption with no fibrosis phenomena.

The obtained results of the experiment have been realized in clinical practice of the Russian Eye and Plastic Surgery Centre and in a number of clinics of traditional medicine and rehabilitation. It is also necessary to note that the given pharmacopuncture procedure is used as an independent method of treatment regardless of the surgical intervention. By now, we have accumulated a large clinical material on the application of pharmacopuncture methods with Alloplant biomaterials for lesions of the central and peripheral nervous system, musculoskeletal system, digestive system organs, reproductive system, skin, cardiovascular system and respiratory system.

editor reviewed

References

1. **Muldashev, E. R.; Galiyakhmetov, R. F.:** Experimental Justification for Using Dispersed Forms of Allografts in Acupuncture. *Acupuncture and natural medicine,* Bratislava, MSNM, 2015 (1), pp. 22–26, ISSN-1339-4703.
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3. **Muldashev, E. R.; Galiakhmetov, R. F.:** Experimental and clinical bases of the concept of regenerative medicine Alloplant. *Acupuncture and natural medicine,* Bratislava, MSNM, 2015 (5–6), pp. 22–31, ISSN-1339-4703.

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2. **Survey** – may deal with actual topics and issues in acupuncture and other interdisciplinary fields, informative and discussion contributions. A survey should not be a review of an existing literature; it should bring a new perspective on the problem.
3. **Case report** – will be published only if it brings new and original view on a topic and contains innovative findings.

Editor Reviewed Contributions

1. **Review of a scientific work** – short informative review. It is necessary to state names of authors, the original and the translated title of the reviewed publication and its ISBN/ISSN, the year of publishing and in the frame of a review its asset.
2. **Report on scientific events** – should contain the name of the event, its place and date, the organizer of the event, an overview of contributions and discussion eventually short abstracts of presentations and a total evaluation of the event by the author of the report inclusive its possible asset.
3. **Discussion to articles published in the e-magazine Acupuncture and Natural Medicine.** It is necessary to state the title of the article, the number and volume of the magazine *Acupuncture and Natural Medicine* that is discussed, the title, the name, the workplace and the function of the person discussing.
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October 6–8, 2017

in hotel Kormorán, Šamorín – Čilistov, Slovak Republic

Dear Colleagues,

we have already become accustomed to the tradition of annual congresses that bring the latest knowledge of acupuncture and natural medicine. We have also got accustomed to the interdisciplinary approach without which there is no possible progress in the medicine or other sciences. As usually this year's Congress will again be a little different. It is co-organised by International Society of Natural Medicine. Interdisciplinary program engagement will be extended which will sure open next possibilities for cooperation in expanding and developing natural medicine. New knowledge of acupuncture as one of the main themes of the Congress and the whole of Natural Medicine will be the flagship of not only Slovak acupuncture also this time. The Congress will take place in beautiful natural environs in Šamorín – Čilistov, near the Danube River and the borderline of three countries. We believe you will attend the Congress this year, too, and that you will not miss this unique opportunity to strengthen the knowledge, inspiration and informal meet each other in person.

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Programm

Friday, October 6, 2017

9:00 – 10:00 am	*Official Opening of Congress, Guests' Greeting*
Block A:	Spirituality, Philosophy and Concept of Natural Medicine
Working Chair:	*Solár, G., Meissner, F., Rak, J.*
10:15 – 10:45 am	**Solár, G.** (SK): **Philosophy, Ethics and Spirituality of Natural Medicine**
10:45 – 11:00 am	*Coffee break 1*
11:00 – 11:30 am	**Meissner, F.** (DE): **Spiritual Medicine as an Integrative Modality in a Clinic for Holistic Medicine**
11:30 am – 12:00 pm	**Rak, J.** (CH): **Quantum Surreality and Grand Unification**
12:00 – 12:30 pm	Panel discussion on block A
12:30 – 2:00 pm	*Lunch*
Block B:	Natural and Regenerative Medicine
Working Chair:	*Nigmatulin, R. F., Ilievska, T., Solárová, Z.*
2:00 – 2:30 pm	**Nigmatulin, R. F.** (RU): **Alloplant Biomaterials in the Conceptual Model of Natural Medicine**
2:30 – 3:00 pm	**Kadyrov, R. Z.** (RU): **Alloplant Biomaterials in Regenerative Surgery of Highly Differentiated Eyeball Structures**
3:00 – 3:30 pm	**Galiakhmetov, R. F.** (RU): **Basic Principles and Clinical Aspects of Alloplant Regenerative Therapy**
3:30 – 4:00 pm	**Iliyevska, T.** (MK): **Innovative Bioinformatical solutions**
4:00 – 4:30 pm	Panel discussion on block B
4:30 – 4:45 pm	*Coffee break 2*
Block C:	Geology, Water and Natural Medicine
Working Chair:	*Baliak, F., Gajdoš, V., Murcková, V.*
4:45 – 5:15 pm	**Baliak, F.; Brček, M.; Panuška, J.** (SK): **Prediction of Landslides and Methods of Protection against Risks to Human Life and Work**
5:15 – 5:45 pm	**Gajdoš, V.; Gajdoš, J.** (SK): **Impact Assessment of Long-Stay Patients in Geopathogenic Zone on His Health – part 2**
5:45 – 6:15 pm	**Rosinský, T.** (SK): **Living and Dead Water**
6:15 – 6:45 pm	Panel discussion on block C

Saturday, October 7, 2017

Block D:	Molecular Biology and Apitherapy in Natural Medicine
Working Chair:	*Kutejová, E., Majtán, J., Bučeková, M.*
09:00 – 09:30 am	Kutejová, E. (SK): **Gene Mutations, Protein Modifications and Their Association with the Onset of Disease**
09:30 – 10:00 am	Majtán, J.; Bučeková, M.; Majtán, V. (SK): **Honey in Human Medicine – Medical Honey**
10:00 – 10:30 am	Bučeková, M.; Sojka, M.; Majtán, J.; Majtán, V. (SK): **Immunomodulatory and Healing Effects of Maternal Jelly and Bee Peptide Defensin-1**
10:30 – 11:00 am	Panel discussion on block D
11:00 – 11:15 am	*Coffee break 3*

Block E:	Economic, Social and Artistic Aspects in Natural Medicine
Working Chair:	*Košturiak, J., Schushardzhan, S. V., Gajdoš, J.*
11:15 – 11:45 am	Košturiak, J. (SK): **Industrial Revolutions and "Needless" People**
11:45 am – 12:15 pm	Schushardzhan, S. V. (RU): **Scientific Music Therapy – Achievements and Prospects**
12:15 – 12:45 pm	Panel discussion on block E
12:45 – 2:00 pm	*Lunch*

Block F:	Regenerative and Natural Medicine – Physical Approaches
Working Chair:	*Hučko, B., Izjumov, S. V., Solár, J.*
2:00 – 2:30 pm	Hučko, B.; Čekan, M.; Horváth, F. (SK): **Uses of Magnetic Field for Knee Cartilage Regeneration**
2:30 – 3:00 pm	Izjumov, S. V. (RU): **Use of Very High Frequency Electromagnetic Waves (VHF) in Healing Processes**
3:00 – 3:30 pm	Panel discussion on block F
3:30 – 3:45 pm	*Coffee break 4*

Block G:	Regenerative and Natural Medicine – Medical Interdisciplinary Approaches
Working Chair:	*Slobodníková, J., Krajčovičová, Z., Mochnáč, T.*
3:45 – 4:15 pm	Slobodníková, J. (SK): **MEIK (Electro Impedance Mammography) in the Diagnosis of Breast Cancer from a Radiologist's Perspective**
4:15 – 4:45 pm	Krajčovičová, Z.; Slobodníková, J.; Meluš, V.; Kašlíková, K. (SK): **Hyperbaric Oxygen Therapy of Chronic Wounds from the View of Laboratory Medicine**
4:45 – 5:15 pm	Panel discussion on block G
5:15 – 7:15 pm	THE FIRST GENERAL ASSEMBLY OF THE MEDICAL SOCIETY OF NAURAL MEDICINE
8:00 pm – 12:00 am	*Social evening*

Sunday, October 8, 2017

Block H:	Acupuncture, Traditional Medicine, modeling
Working Chair:	*Petoukhov, S. V., Miklóšová, M., Kadyrov, R. Z.*
09:00 – 09:30 am	Mochnáč, T. (SK): **Flebotrombosis of the Lower Limbs and Acupuncture**
09:30 – 10:00 am	Petoukhov, S. V., Petukhova, E. (RU): **"I-Ching", Binary Systems in Modern Science and New Algebraic Approaches in Bioinformatics**
10:00 – 10:30 am	Miklóšová, M. (SK): **Energo-information Network and Eye**
10:30 – 10:45 am	*Coffee break 5*
10:45 – 11:15 am	Solár, G. (SK): **Pyramidal Model – Qualitative Shift in Complex Acupuncture Theory, Diagnostics and Therapy**
11:15 – 11:45 am	Solár, J. (SK): **Checkpoints of the Pyramidal Model from Interdisciplinary Point of View**
11:45 am – 12:15 pm	Panel discussion on block H
12:15 pm– 1:00 pm	*Evaluation of the Congress Conclusions and Congress Closing Ceremony*

Scientific and Program Committee of the Congress

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