

Volume: 2014

Number:

2



ACUPUNCTURE and NATURAL MEDICINE



**MEDICAL SOCIETY OF
NATURAL MEDICINE**

ISSN 1339-4703



Acupuncture and Natural Medicine

Editorial

Ladies and gentlemen, dear readers,

similarly to the first issue of our magazine this year, this issue also comes in a lingering festive atmosphere. During Easter we commemorated new resurrection of life and new hope. Many of us were in contact with a need to develop all human dimensions including the spiritual ones. Although this year's winter was- strictly speaking- not a real winter, an unusually warm spring started in full force. Looking at the awakening nature, we realize how important it is to be in accordance with it, to respect the cycles and patterns of nature, as it is emphasized in natural medicine. However, recently introduced summer time is of direct evidence that the practice is often a little different. Despite knowledge of natural medicine is the cancellation of summer time still out of sight. It would be enough to look, for example on the statistics on traffic accidents or the incidence of heart attacks in the first day after the introduction of summer time ...

General acceptance of knowledge of natural medicine requires serious interdisciplinary study. Our magazine has the ambition to contribute to this study. Therefore we bring also in this issue new and interesting information and suggestions to professional discussions.

Acupuncture, which is still mostly considered only as part of traditional Chinese medicine, shows new relationships and interconnections that traditional medicine has not known. MUDr. G. Solár, PhD analyses them in more detail in the article „Triplets, concatenation, BAGUA and patterns in acupuncture“. The questionnaire in acupuncture brings- besides the extension of diagnostic possibilities- also more new knowledge about relationships and interconnections. In this issue PaedDr. Z. Solárová, PhD. continues with their presentation. She defines the newly introduced elements of assessment of acupuncture questionnaire according to Korngold and Beinfeld, in the modification by the author of this paper. MUDr. T. Mochnáč, PhD. is dedicated to objectify the efficiency of an electromagnetic resonant background on energy-interactional and biomorphological relations of the organism. Doc. RNDr. Khun M, PhD. shows a view of an environmental geochemist on water. He highlights the world's most famous endemic poisonings by potentially toxic trace elements of As. RNDr. P. Takáč, PhD. presents a remarkable method of treating skin diseases using fish *Garra rufa* in his article on "Ichthyotherapy". Acupuncture study changes thinking and approach of a doctor who tries to break into the full width of the problems. MUDr. J. Opáthová describes her experience with this process in our regular section.

I already point out that this year's top scientific event will be the XVIII-th Medical Congress of Natural Medicine with interdisciplinary participation. It will be held on 3rd – 5th of October 2014 in Šamorín-Čilistov in hotel Kormoran. We cordially invite you to this event, to enjoy beautiful surroundings of the park along Danube embankment. You can find more information shortly on our website.



I wish you a pleasant and inspiring moments with our magazine.

Yours sincerely,

Soňa Sázelová, M.D.
Chief Editor

EDITORIAL OFFICE

CHIEF EDITOR

Soňa Sázelová, M.D.

DEPUTY EDITOR RESPONSIBLE FOR FOREIGN AFFAIRS

Eva Baumann, M.D.

EDITORIAL BOARD

Soňa Sázelová, M.D.
Eva Baumann, M.D.
Martina Lehocká, M.D.
Solijon Mamarasulov, M.D.
Magdaléna Miklósová, M.D.
Katarína Loncková, M.D.
Mgr. Valentín Dikarev

TECHNICAL EDITOR AND GRAPHIC DESIGN

Mgr. Stanislav Gajdoš, MBA

CONTACTS

E-mail:
office@naturalnamedicina.com

URL:
www.naturalnamedicina.com

Address:
Ivanská cesta č. 23
82104 Bratislava



SCIENTIFIC COUNCIL

Prof. RNDr. František Baliak, PhD.
*STU Bratislava, Civil Engineering,
Department of Geotechnics*

RNDr. Katarína Bíliková, PhD.
*Dpt. of Molecular Apidology,
detached branch of Institute of Forest Ecology, Bratislava*

Doc. Ing. Ján Brindza, CSc.
*Slovak University of Agriculture
Institute of Biodiversity Conservation and Biosecurity*

Juraj Gajdoš, M.D.
*General Practitioners for Adults and Acupuncturist,
N.z.z. Trnava*

Doc. RNDr. Vojtech Gajdoš, CSc.
Geophysicist, Bratislava

Prof. Štefan Galbavý, M.D., DrSc.
*Institute of Laboratory methods,
St.Elisabeth University of Health and Social sciences,
The St.Elisabeth Cancer Institute Bratislava*

Jean-Marc Kespi, M.D.
*Honorary President of the French Association
of Acupuncture (AFA)*

Doc. RNDr. Miloslav Khun, CSc.
*UK Bratislava, Faculty of Natural Sciences,
Department of Geochemistry*

Dr. Pil-Gun Kim, K.M.D. PhD ,
*Korean Medicine Association, Seoul
president*

Prof. Ing. Ján Košturiak, PhD.
*Managing Director, IPA Slovakia,
Professor Tomas Bata University Zlin*

Ing. Eva Kutejová, CSc.
*Dpt. of Biochemistry and Structural Biology,
Institute of Molecular Biology, SAV, Bratislava*

prim. Anna Loskotová, M.D.
*chief of clinic of physiotherapy - SALVE Centre,
Vysoke Myto, CZ
MASARYK University in Brno,
Clinic of Burns and Reconstructive Surgery,
University hospital in Bohunice, CZ*

Folker Meissner, M.D.
*Chairman of the German Academy of Energy
Medicine and Bioenergetics (DAEMBE)
Clinic for Holistic Medicine Dr. Folker Meissner*

Teodor Mochnáč, M.D., PhD.
*Akupunktum,
Center of acupuncture and diabetic foot, Nitra*

Prof. Marián Mokáň, M.D., Dsc., FRCP Edin
*Department of Internal Medicine I.,
Jessenius Faculty of Medicine
Comenius University and University Hospital Martin*

Prof. Chi-Chung Peng
*Associate Professor & Chairman
National Formosa University, Department of Biotechnology
Huwei, Yunlin, Taiwan*

Prof. Larisa Yurevna Slatinskaya
*Doctor of science in the Russian Academy of Natural Sciences,
professor, Doctor of natural medicine,
Member of Russian Scientific Organization of natural medicine,
Academician of Westeuropean Academy of Science
and Culture e.V.,
Director of centre of Natural Medicine "Life Bionomics", Russia*

Doc. Jana Slobodníková, M.D., CSc. h.Prof.
*Faculty of Health, KLVM
Alexander Dubcek University of Trencin*

prim. Gustáv Solár, M.D., PhD.
*The First Clinic of Acupuncture and Natural Medicine
of G.Solar s.r.o., professional supervisor*

Zlatica Solárová, M.P., PhD.
*The First Clinic of Acupuncture and Natural Medicine
of G.Solar s.r.o., executive director*

Prof. Miron Šramka, M.D., DrSc.
*St.Elisabeth Cancer Institute, Bratislava
Department of stereotactic radiosurgery.
St.Ellisabeth University of Health and Social Sciences,
Bratislava*

Dr. Stefan Stângaci
*President of Apitherapy Consulting & Trading International Ltd.
President of the Romanian and German Apitherapy Societies.
Secretary General of the International Federation of Apitherapy*

Prof . Park Wan Su
*The Chief Vice President of AKOM
(the Association of Korean Medicine)
Professor, Dept. of Pathology, College of Korean Medicine,
Gachon University, Republic of Korea*

Kikuji Yamaguchi, PhD.
*Company Chairman & CEO
Yunnan Agricultural University, Kyobashi Chuo-ku, Tokyo*

Jeong Yeonil M.D.
*Korean Medicine Association, Seoul
Director for Foreign Affairs*



Table of Contents

Acupuncture Little Different

Triplets, concatenation, bagua and patterns in acupuncture	5
Gustáv Solár, M.D., PhD.	

Clinic and Research

The background resonance radiation acupuncture (BRR)	17
Teodor Mochnáč , M.D., PhD.	

Selected Relations in the MKBD-S Questionnaire (Korngold – Beinfield Questionnaire Modified by the Author of the Article)	24
Zlatica Solárová M.P. PhD.	

Interdisciplinary Insights

Anti-inflammatory Effect of Morindae Officinalis Radix Water Extract in LPS-induced RAW 264.7 Mouse Macrophages	30
Wansu Park, MD, PhD. Young-Jin Kim Hyun-Ju Kim	

Water from environmental geochemist's point of view	38
Doc. RNDr. Miloslav Khun, Csc.	

Ichthyotherapy - biotherapeutic treatment method for patients with skin diseases using <i>Garra rufa</i> fish	46
RNDr. Peter Takáč, CSc.	

An Insight into the Acupuncture Thinking

The change of my acupuncture thinking	58
prim. Jarmila Opáthová, M.D.	
Instructions for Authors	60



Triplets, concatenation, bagua and patterns in acupuncture

Gustáv Solár, M.D., PhD.

Abstract

The original, traditional teaching of acupuncture is rooted in the assertions and procedures established by the 'old masters'. These procedures are perceived axiomatically and are usually not being proved in any way. However, modern knowledge about acupuncture shows that the separation of thinking to 'eastern' and 'western' types is a sign of essential incomprehension of acupuncture's philosophical and logical principles. We analyze specific relationships and connections of the system of acupuncture, basing our assertions on well-known traditional sources, as well as specific relations consequent from other scientific disciplines. The result of this analysis is the introduction and description of the notions triplet and the concatenation or chaining of YANG and YIN in acupuncture. With the help of these notions, we define three new bagua: bagua S1, bagua S2 and bagua Universal. We outline their mutual mathematical relationship and progression. The knowledge of these mathematical and logical relations in acupuncture demythologizes it and opens up various new opportunities for serious and interdisciplinary study of acupuncture, as well as natural medicine itself.

Keywords: system of acupuncture, triplets in acupuncture, concatenation of Yang, concatenation of Yin, bagua, bagua S1, bagua S2, bagua Universal, logic in acupuncture, rotary microsystems

Introduction

The original, traditional teaching of acupuncture is rooted in the assertions and procedures established by the 'old masters'. These procedures are perceived axiomatically and are usually not being proved in any way. In contemporary literature, we can come across phrases such as 'according to traditional concepts', or just a statement that the given claim is 'based on traditional teachings'. Not so long ago, there still used to be a strong emphasis on the distinction between 'western' and 'eastern' thinking. Comparisons of various procedures were based solely on clinical results, very often paired with methodologically unacceptable processes, like mechanically comparing acupuncture and western diagnostics. Even today, we encounter the phrase 'placebo acupuncture', which is completely irrelevant in the light of the contemporary knowledge concerning microsystems and projections in various regions of the body.

Contemporary knowledge about acupuncture shows that the division of thinking into 'eastern'



and 'western' types is not only a sign of essential incomprehension of acupuncture's philosophical and logical principles, but also the main barrier hindering the application and spreading of serious medical acupuncture in the West. However, it is clearly evident that both the 'eastern' and 'western' sides contribute to this utterly meaningless division. The common denominator of both sides, regardless of acupuncture's regional success or tradition, is the insufficient comprehension of its logic and systematics and, consequently, its very essence. Nonetheless, contemporary scientific results prove the necessity of applying logic in the research of acupuncture. And we do not mean a special kind of logic either, but the logical relationships and mathematical principles of the system, which serves as the basis for acupuncture, as well as for its medical application. These principles correspond to the latest results of modern science, which only proves that they are universal and timeless.

Material and methodology

We analyzed specific relationships and connections of the system of acupuncture, basing our assertions on well-known traditional sources, as well as specific relations consequent from other scientific disciplines. We based our terminology on the physical and genetic concepts, while using Latin and Greek nomenclature for the meridians, in a way that should be comprehensible in any language.

CO (**cor**), IT (intestinum **tenue**), VU (**vesica** urinaria), RE (**ren**), PE (**pericard**), TC

(**tricalorium**), VF (**vesica fellea**), HE (**hepar**), PU (**pulmo**), IC (intestinum **crassum**), VE (**ventriculus**) a LP (lien **pancreas**)

Basic notions:

Triplets

The idea of triplet is generally defined as something containing three elements (Wikipedia, 2014). For example in genetics, triplets refer to three pairs of nucleotides constituting a **codon** in the DNA or mRNA molecule, which is a part of the genetic code and defines the insertion of certain amino acids into the polypeptide chain. The genetic code consists of 64 codons. We will not discuss the analogies with acupuncture here (e.g. 64 hexagrams of the I Ching), but we would like to return to this topic in the following parts of our series. In acupuncture, every meridian comes from a previous meridian and ends in a subsequent meridian, and therefore is the apex or peak of a triplet. In essence, every process has an initial phase (where it is transformed from a different process), a peak phase (where it reaches an apex as the process itself) and a transitional phase (where it transforms into a different process). This is the essential principle of a triplet as we see it in acupuncture, where we can freely substitute 'process' with notions like element, meridian, etc. These triplets can be organized in different ways, e.g. according to the circadian rhythm, or various types of concatenation, which we will discuss later, etc. Despite their varying structure, triplets retain an unequivocal logic in any mutual comparison. A



meridian is determined by several triplets analogously, just like a codon is in genetics. The analogous alignment of elements in a pentagram is determined by several triplets. For example, in the cycle of creation, WOOD becomes FIRE, which becomes EARTH. Therefore, the element of FIRE is determined by the triplet WOOD – FIRE – EARTH in the cycle of creation. In this case, just like in the cases mentioned before, the FIRE triplet, or the triplet of any other element can be arranged in different ways. These mutual relations, through various triplets, determine the physiological and pathological dynamics and the relationship between meridians and elements. The analogies with genetics are no less evident. The various characteristics of triplets exceed the possible extent of this article, but we are no doubt going to deal with them in the next part of the series.

Just for the purposes of illustration, we are including two possible meridian triplets:

	According to concatenation	According to the circadian rhythm
Meridian PU	LP - PU - TC	HE - PU - IC
Meridian IT	VU - IT - VF	CO - IT - VU
Meridian LP	PE - LP - PU	VE - LP - CO

Table 1: Examples of meridian triplets

Concatenation

Concatenation is not a generally accepted term in acupuncture. In our case, we will deduce the basic yang and yin concatenations, basing our assertions mainly on physical notions and relations. The basic physical categories that we use are entirely fundamental and generally accepted. We decided to include them, despite

that their general perception is no basis for any controversies at all.

Mass – in physics, it is an attribute of substances and entities manifested in rest mass or force field. In modern physics, material and field are the interconnected structural manifestations of matter. (sk.m.wikipedia.org/wiki/Hmota_(fyzika)2014)

Energy – in physics, energy is a constant denoting the motion of mass in all its forms (sk.m.wikipedia.org/wiki/Energia2014). The theory of relativity considers the notion of mass and energy to be equal.

Space – physically speaking, it is the feature of material objects defining their mutual distance (sk.m.wikipedia.org/wiki/Priestor_(fyzika)2014)

Time – as a constant in physics, it expresses the interval between two events, or the duration of an action (sk.m.wikipedia.org/wiki/%C4%8C%C4%8Cas_(fyzika)2014). In contemporary physics, it is seen as one of the fundamental quantities, which cannot be defined through other quantities. Time and space were merged into the single space-time continuum by A. Einstein.



Mass, energy, space and time are properties dependent on how fast the particle or object is moving compared to us.

We can add additional, closely connected categories to the basic ones mentioned above:

Harmony – we understand this term in the given context as a God-given harmony between all substances without the presence of any direct or mutual action between them. (The German polymath and philosopher G.W. Leibniz at the turn of 17th and 18th centuries called it pre-established harmony)

Dynamics – in physics, dynamics is generally concerned with the effects of forces on the motion of objects, which is described by quantum physics in the microcosm. For our purposes, it will be sufficient to consider the changes in motion by means of physical fields.

Penetration – in the given context, we mean the penetration to the essence, or, in other words, understanding a phenomenon.

Stability – in physics, stability is defined as the preservation of properties without a change in time, which is sufficient for the purposes of acupuncture.

If we connect these categories in mutual relations and connections, we get the following

table (Table 2). HARMONY belongs to the category of MASS, as it defines the quality and properties of mass. ENERGY is connected to DYNAMICS, which determines the character of energy's effects. SPACE is determined by its STABILITY; TIME, seen as a sequence of events, is determined by PENETRATION, i.e. the ability to process this sequence.

By combining the categories of mass and energy, we also combine the categories of harmony and dynamics because harmony and dynamics determine mass as an attribute of substance and entities.

Correspondingly, if we combine time and space, space-time and its properties will be determined by stability and penetration.

Analogously, the relations in the system of acupuncture in the organism, which is the very basis of energy-informatics, have their own logic and principles and are multidimensional and multilayered.

Relations and connections

• MASS	↔	HARMONY
• ENERGIE	↔	DYNAMICS
• SPACE	↔	STABILITY
• TIME	↔	PENETRATION

Table 2: Relations and connections between categories



As we have already mentioned in the previous part of our series, meridians are the manifestations or 'consequences' of field with a firm structure, which direct the structures of the body and carry information. It is apparent from the properties of fields (for example in triplets) that each meridian primarily affects its corresponding organ channel, but its effects on the body are more complex. For example the VF meridian, in the light of the above categories, represents 'penetration' even in the traditional concepts. It exceeds the spleen channel, where its imbalance is typically manifested. Traditional medicine describes the other meridians in the same fashion, that is why it is important to comprehend the allotment of meridians to physical categories in a complex way, as the projection of the individual parts of the organism's complex energy-informational field into the various organ systems. The following table (Table 3) shows the allotment of meridians to physical categories.

Physical categories and meridians	
– MASS	RE
– HARMONY	IT
– ENERGIE	LP
– DYNAMICS	TC
– SPACE	PU
– STABILITY	PE
– TIME	VU
– PENETRATION	VF

Table 3: Physical categories and meridians

There are only eight meridians in the table, like the alignment in ba-gua. We assigned the four missing meridians (CO, HE, VE and IC) to the category of 'higher meridians'. They constitute a so-called 'vertical structure' that will be discussed in subsequent parts of this series.

The table below (Table 4) shows the sequence of individual meridian triplets (bottom to top). The sequence on the left is repeated according to the sequence harmony-penetration-mass-time. The following table on the next page repeats the sequence dynamics-stability-energy-space. The sequences determine the yang and yin concatenations (Table 5). The ratio of YANG to YIN is 3:1 in the YANG concatenation and 1:3 in the YIN concatenation, thus expressing polarity and mutual inseparability. The ratio 3:1 is also well know from genetics, e.g. from Mendel's laws. At the same time, no concatenation is 'pure' (only YANG or only YIN), which is in accordance with the traditional theory of acupuncture.

Triplets	
• Space PU	• Time VU
• ENERGY LP	• MASS RE
• Stability PE	• Penetration VF
• Harmony IT	• Dynamics TC
• TIME VU	• SPACE PU
• Mass RE	• Energy LP
• Penetration VF	• Stability PE
• HARMONY IT	• DYNAMICS TC
• Time VU	• Space PU
• Mass RE	• Energy LP
• PENETRATION VF	• STABILITY PE
• Harmony IT	• Dynamics TC

Table 4: Triplets



LP	PU	TC
VI	RE	VU
VU	IT	VI
PE	LP	PU
RE	VU	IT
TC	PE	LP
PU	TC	PE
IT	VF	RE

TRIPLETY
PODĽA
ZREŤAZENÍ

Table 5: Triplets according to concatenations

Tables 6 and 7 demonstrate the analogies between various concatenations and the relationships in traditional Chinese acupuncture. They prove that the results of traditional medicines also base their rules and principles in logical constructs, while their origin remains unexplored. Therefore, they're definitely not 'traditional Chinese concepts', as they are very often presented in the West, but fragments of an original, unified and complex logical and mathematical system, which greatly exceeds the borders of both acupuncture and China, and which has a universal character.

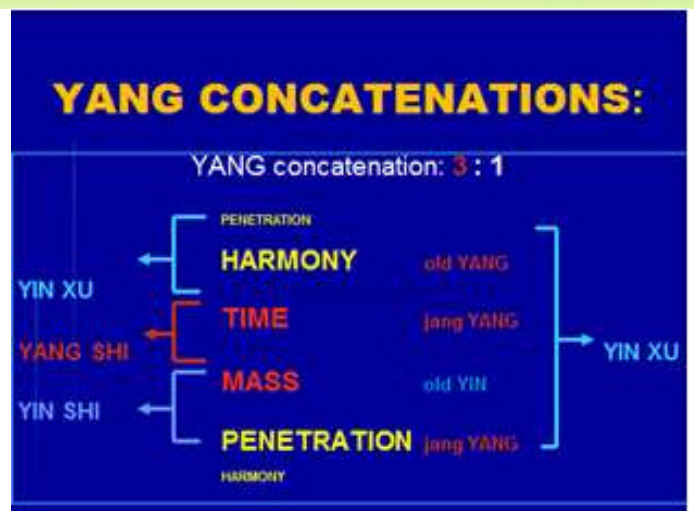


Table 6: YANG concatenations



Table 7: YIN concatenations

BA-GUA

Ba-gua (eight symbols) consists of eight trigrams representing the essential nature of all things. Fuxi created the first ba-gua, which expressed the essential aspect of things. Heaven was above and the Earth below.(Picture 1) The second ba-gua was established about 600 years later, allegedly by king Wen. This ba-gua expresses a dynamic state, where Fire is above and Water below.(Picture 2)

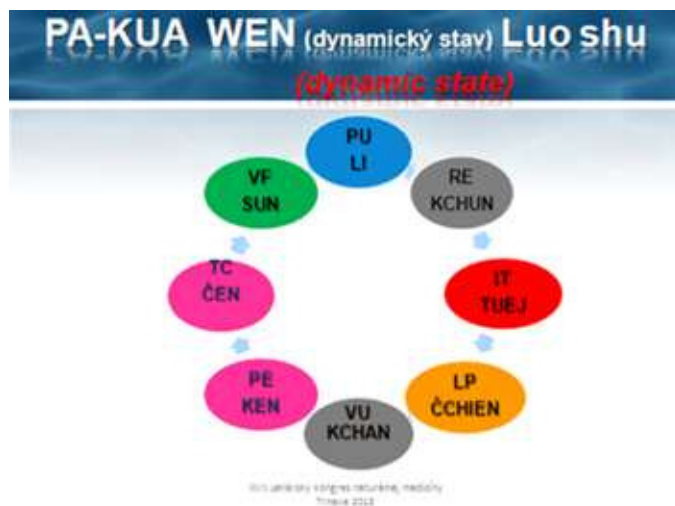
Acupuncture Little Different

Triplets, concatenation, bagua and patterns in acupuncture

Gustáv Solár, M.D., PhD.



Picture 1: Ba-gua FUXI and meridians



Picture 2: Ba-gua Wen and meridians

These two alignments are accepted to this day, constituting one of the most important pillars of traditional Chinese medicine and Feng Shui. They are usually interpreted and accepted as tradition, without any special attention being paid to their mutual relationship and connections. It was only when we started to analyze them through the meridian triplets that we found a logical and mathematical connection and sequence between them. This fact by itself

eliminates the possibility of a mythical origin. If we follow the principles, we will gradually find out that there have to be two more ba-gua, which we have provisionally called S1 and S2. Both constitute a sort of a transition between Fuxi and Wen.



Picture 3: Ba-gua S1 and meridians



Picture 4: Ba-gua S2 and meridians

There is Wind below and Storm above in the S1 ba-gua, while the S2 ba-gua has Mountain above and Lake below. (Picture 3,4) Table 8 shows all four ba-gua and the meridian triplets constituting them.

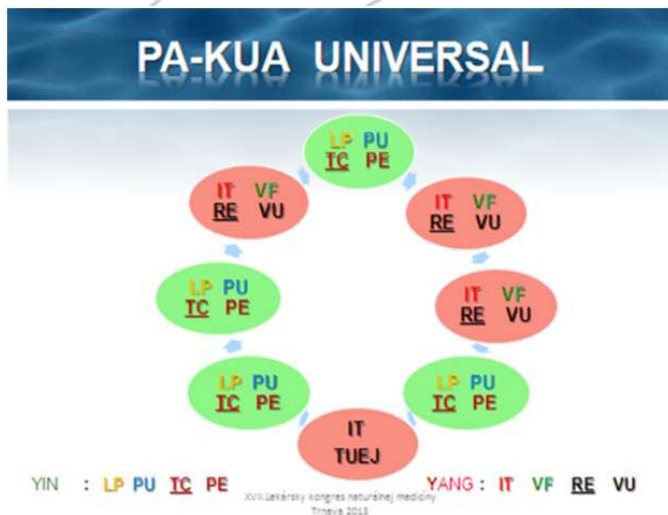


FU-SI			S1			WEN			S2		
PE	LP	PU	PU	TC	PE	LP	PU	TC	TC	PE	LP
IT	VF	RE	VU	IT	VF	VF	RE	VU	RE	VU	IT
RE	VU	IT	VF	RE	VU	VU	IT	VF	IT	VF	RE
TC	PE	LP	LP	PU	TC	PE	LP	PU	PU	TC	PE
VF	RE	VU	IT	VF	RE	RE	VU	IT	VU	IT	VF
PU	TC	PE	PE	LP	PU	TC	PE	LP	LP	PU	TC
LP	PU	TC	TC	PE	LP	PU	TC	PE	PE	LP	PU
VU	IT	VF	RE	VU	IT	IT	VF	RE	VF	RE	VU



Table 8: Four ba-gua in triplets

The horizontal relations in the table demonstrate that the ba-gua sequence creates both YANG and YIN concatenations. In uniting all four ba-gua, we get the Universal ba-gua (Picture 5), which consists of YANG and YIN concatenations.



Picture 5: Ba-gua in the triplets

This is crucially important in the so-called rotary microsystems, which constitute one of the basic pillars of TST (Tactile Solar Test). The

rotary microsystems will be dealt with in later installments of this series. It also opens up new possibilities to study the ways in which information is stored in the organism and its system of acupuncture. This is important not only for acupuncture studies, but for the whole natural medicine in an interdisciplinary context as well.

The mutual connections and sequences of each ba-gua can be described via the following points:

1) FUXI – WEN: the peak section of the FUXI triplet to the transitional section of the WEN triplet, which corresponds to the WEN ba-gua, where it also applies to the YANG and YIN concatenations

2) WEN - FUXI: the peak section of the WEN triplet moves to the transitional section of the FUXI triplet, which corresponds to the FUXI ba-gua, where it also applies to the YANG and YIN concatenations (In the following text, the term YANG substitutes the YANG concatenation and the term YING the YING concatenation)

3) FUXI - S1:

YANG – movement from the peak of the FUXI triplet to the transitional section of the S1 triplet

YIN – the 4th section (not present in FUXI) of the concatenation is on the peak of S1

4) S1 - FUXI:

YANG – the peak section of the S1 triplet moves to the initial section of the FUXI triplet

YIN – the 4th section (not present in S1) of the



concatenation is on the peak section of FUXI

5) FUXI - S2:

YANG – the peak section of the FUXI triplet is the 4th section of the concatenation (not present in S2)

YIN – the initial section of the FUXI triplet moves to the peak section of the S2 triplet

6) S2–FUXI:

YANG – the peak section of the S2 triplet is the 4th section of the concatenation (not present in FUXI)

YIN – the peak section of the S2 triplet moves to the initial section of the FUXI triplet

7) WEN - S1:

YANG – the peak section of the WEN S2 triplet is the 4th section of the concatenation (not present in S1)

YIN – the peak element of the WEN triplet moves to the initial section of the initial section of the S1 triplet

8) S1–WEN:

YANG – the peak section of the S1 triplet is the 4th section of the concatenation (not present in WEN)

YIN – the peak section of the S1 triplet moves to the transitional section of the WEN triplet

9) WEN - S2:

YANG – the peak section of the WEN triplet moves to the initial section of the S2 triplet

YIN – the peak section of the WEN triplet is the

4th section of the concatenation (not present in S2)

10) S2 - WEN:

YANG – the peak section of the S2 triplet moves to the initial section of the WEN triplet

YIN – the peak section of the S2 triplet is the 4th section of the concatenation (not present in WEN)

11) S1 - S2:

YANG – the peak section of the S1 triplet moves to the transitional section of the S2 triplet

YIN – the peak section of the S1 triplet moves to the initial section of the S2 triplet

12) S2 - S1 :

YANG – the peak section of the S2 triplet moves to the initial section of the S1 triplet

YIN – the peak section of the S2 triplet moves to the transitional section of the S1 triplet

Discussion

The division of thinking into “western” and “eastern” has considerably complicated the understanding and study of acupuncture in the West. In some places, it is still considered to be nothing but a part of traditional Chinese medicine, which is interpreted and taught more or less axiomatically and scholastically – for various reasons, mutual relations and connections are only analyzed rather unsystematically. In spite of various linguistic formulations, obvious analogies with other scientific disciplines are in fact overlooked. It is



not possible to rely on relevant literary sources in the study of this topic; knowledge can only be gained from traditional literary sources, which mention virtually no additional connections. However, mathematical principles and sequences are clearly evident, and the usage of notions like triplets and concatenations – commonly used e.g. in genetics, psychiatry and other disciplines – is no less logically justified and analogous in the theory and logic of acupuncture. This is one field where modern acupuncture exceeds the limitations of the traditional one. The other is the recognition of mathematical connections and sequences in places, where traditional acupuncture has been mythologizing them for thousands of years. Ba-gua serves as a clear example. Traditional medicine only recognizes two ba-gua: FUXI and WEN. It has never been able to recognize the other ba-gua, or they would have appeared in traditional or modern literature. The same is true about triplets and concatenations. Yet the sequence of triplets and their various possibilities in both acupuncture and genetics allow for the study of the energy-informational 'metabolism' as well as the use of analogous scientific results in acupuncture. The same applies to concatenations. These logical connections and sequences, hitherto unknown in acupuncture, have a demythologizing effect and enable a complex scientific and interdisciplinary study of acupuncture. The systematic approach presented in this publication should be subject to broader (and not only medical) verification – it is necessary for the semantic and objective

interdisciplinary acceptance of its subject matter.

Conclusion

The analysis of acupuncture's system has proven that it contains mathematical relations and connections, which have never been recognized by traditional Chinese medicine. Contemporary scientific knowledge enables – analogously to genetics – the introduction and definition of notions such as triplets, Yang and Yin concatenations, as well as the definitions of the new ba-gua S1, S2 and Universal. The study of these relations and connections opens up new opportunities for the scientific and interdisciplinary research of acupuncture's system, energy-informatics and natural medicine in its entirety.

Gustáv Solár MD. PhD.

The First Clinic of Acupuncture and Natural
Medicine of G.Solar s.r.o.

Ivánska cesta 23, Bratislava

Slovakia

www.akupunktura.sk

e mail: klinika@akupunktura.sk

Bibliography

1. Ando, V.: *Klasická čínska medicína – základy teórie III*. Svítaní, Hradec Králové, 1997, ISBN 80-90178863.
2. Beinfield, H., Korngold, E.: *Between Heaven and Earth, a guide to Chinese medicine*. Ballantine Books The Random House Publishing Group New York, 1992, ISBN 0345379748.



3. Král, O.1995. *I-t'ing – Kniha proměn*. Maxim., Praha, 1995, ISBN 80-901333-2-0.

4. Solár, G.: *Pôvod a súčasnosť akupunktúry*. XXVI. Congressus Acupuncturae Slovaciae et Bohemiae cum participatione internacionali, Poprad: s.n., 2011, referát.

5. Wikipédia. 2014. Wikipédia. [online] [3. 1 2014.] <http://sk.wikipedia.org/wiki/Algoritmus>

6. Wikipédia. 2014. Wikipédia. [online] [13. 1 2014.] [http://sk.m.wikipedia.org/wiki/Čas_\(fyzika\)](http://sk.m.wikipedia.org/wiki/Čas_(fyzika))

7. Wikipedia. 2013. Wikipédia. [online] [4. 12. 2013.] http://sk.wikipedia.org/wiki/Genetický_kód

8. Wikipedia 2013. Wikipédia [online]. [8.2.2013] <http://sk.wikipedia.org/wiki/Hmota>

9. Wikipédia. 2014. Wikipédia. [online] [2. 1 2014.] <http://sk.wikipedia.org/wiki/Energia>

10. Wikipédia. [online] [6. 2 2014.] [http://sk.m.wikipedia.org/wiki/Priestor_\(fyzika\)](http://sk.m.wikipedia.org/wiki/Priestor_(fyzika))



Advertisement

Life without pain.



Editorial office is not responsible for the content of advertisements.



The background resonance radiation acupuncture (BRR)

Teodor Mochnáč, M.D., PhD.

Abstract

The phenomenon of the preserved biological information, which can be used for

treatment purposes, is known since the days of Hanneman.

In homeopathy treatment he introduced the concept of similarity treatment. However, in his principle of similarity, he did not define any connecting element, which would refer to all physical conditions. Physical preservation of information and its transmission for the therapeutic purposes mentions also Voll. The basis of the BRR (background resonance radiation) – are so called millimeter waves. Millimeter waves are electromagnetic waves with the same frequency as oscillations of cellular protein structures and cell membranes. The aim was to objectify the effect of electromagnetic background resonance radiation inside the energy-interactional level (the acupuncture system) and bio-morphological level.

A group of 41 patients experienced after the therapy balanced microsystems. From the results we conclude that after exposure to the electromagnetic background resonance radiation, there are positive changes inside the bio-morphological level, the condition of patients improves, pathological symptoms subside, and the skin conductance level changes as well. Surprising effects of the electromagnetic

background resonance radiation indicate that the physical influence of the high frequency electromagnetic waves also significantly affect the acupuncture system and bio-morphological level.

The author in his work defined the principle of similarity in terms of energy-interactional conditions and the ability of influencing such a condition by using the high frequency waves of the electromagnetic background resonance radiation.

Keywords: Background resonance radiation, treatment, diagnosis

Introduction

We use the term information on a daily basis, although the image of what it means, is not entirely clear. In the first place we need to discuss the tangible or intangible nature of information. The Law of Conservation of Information says that the information is encoded in the particles that create the entire universe. (2) Since we live in a multidimensional world or universe that is material, everything in it should be material too. On the other hand, the spiritual information is likely to be immaterial.

But what is information? The most general definition describes information as interaction between the two systems. Further it says that without interaction, information is not registered.

Collection, preservation and distribution of information is a priority of each civilization, each



culture. Nowadays, at the time of information technology acceleration, this phenomenon is quite common in all disciplines.⁽⁵⁾ Preservation of so called biological information, which can be used for treatment purposes, is a phenomenon known since the days of Hanneman, who introduced the concept similar to the homeopathy treatment. However, in his principle of similarity, he did not define any connecting element, which would refer to all physical conditions. Also Voll mentions physical preservation of information and its transmission for the therapeutic purposes. All these phenomena are approached by academic medicine with skepticism. However, they can be described by physics.

Today we know three fundamental interactions or forces: gravity – the medium is hypothetical graviton, electromagnetism – the medium is photon, weak interaction – the medium is W and Z boson (these two forces, electromagnetism and weak interaction, were unified into the electroweak interaction), and strong interaction – the medium is gluon. Their strength and behavior vary considerably. Modern physics attempts to explain every observed physical phenomenon by using these fundamental interactions.

In 1985, British physicist James Clerk Maxwell united all known laws of electricity and magnetism and created a theory based on the existence of fields, which transfer impulses from one place to another. He found out that the fields transferring electrical and magnetic impulses have a dynamic nature – they can oscillate and move through space. Maxwell's equations result in one important conclusion **that all frequencies of electromagnetic radiation move at exactly**

the same speed – at the speed of light. But how to preserve such information to be reproducible and applicable? The first evidence of this phenomenon in physical science was introduced by Dr. **Lene Vestergaard Hau (Professor of Physics and Applied Physics at Harvard University), who in 1998 succeeded in slowing a beam of light and in 2000 was able to stop a beam completely.**

Biological effects of the millimeter spectrum (MMS) electromagnetic (EM) radiation have been studied since the 1960s in various countries including the USA, Canada, France, Germany, and in the former USSR. The result of these studies was a new therapy originating in the USSR called Extremely High Frequency (EHF). In this field, there have been developed many clinical applications. Millimeter waves (MMW) represent an interface between the infrared radiation and radio waves, and they run the range of frequencies from 30 to 300 GHz ($1 \text{ GHz} = 1.109 \text{ oscillations per second}$), corresponding to a wavelength range from 10 to 1 mm. Their density used for medical purposes varies from 1 to 10 mW/cm² and they do not induce heat effects on exposed skin. MMW are electromagnetic waves having the same frequency as oscillations of cellular protein structures and cell membranes. MMW lie in the spectrum between electric and infrared waves and therefore they conform to both the Law of Classical Electrodynamics and the Laws of Quantum Physics. ⁽⁶⁾

After many experiments, the experimenters generally agreed on the indicators for clinical use.



1. Preparation before the radical therapy and surgery.
2. Prevention and treatment of complications after the chemotherapy and radiotherapy in oncology.
3. Prevention of metastatic complications.
4. Palliative therapy of incurable patients.

Some authors, however, do not see the BRR and EHF-low-intensity waves effective and positive results of this therapy have not therefore reached Europe and North America.

In our study we focused on the individual frequency range of 30-500 GHz copied by the Gunn electrode in the area of projected and diagnosed acupuncture point as well as on its use in the therapy. This is called BRR. Due to the fact that previous works only methodically copy the usage of ACP (acupuncture point)-disease system, or ACP-local symptom, we have modified the methodology according to our understanding of disease as a physical energy-interactional state of the organism.

The methodology

First of all, after a solid examination we established the diagnosis and then we applied the systemic acupuncture therapy. We tested the whole group of 41 patients using the standard non-instrumental methodology TST (tactile Solar's test) for examination of microsystems, RMF (rotary microsystem of the face), RMB (rotary microsystem of the breasts) RYIN (rotary microsystem of the yin), UTMT (universal tendomuscular test) and REV (rotary microsystem of extraordinary vessels). (7, 8) From them, we have created a second group of 28 patients, who were examined by the new

methodology IDS-M (impedance data system-M), based on the EAMG (electro-acu-mammography), which helps to assess the general energy-interactional condition. This represents the basis of the therapy. After establishing the diagnosis we located the acupuncture point projection, from which we copied the EMW frequency and applied it for the therapeutic purposes. We controlled the therapeutic effect immediately, in the first group by TST and in the second group by IDS-M using the Rm EAGY (regime electroacugraphy of yuan points) and Rm CM (regime electroacugraphy complex meridians). (4) We evaluated also the effect of the treatment taking in account the patient's current somatic expressions, mobility improvement, pain relief (evaluated in the three-degree assessment scale), or regression of other negative somatic expressions.

Hypothesis

(H) 1: We assumed that the effect of physical characteristics of high frequency EM waves will affect the energy-interactional plane on the skin conductance level.

(H) 2: It will affect the level of the tactile sensitivity of the skin.

(H) 3: It will affect the level of somatic symptoms.

The goal of the study is to objectify

1. The changes on the tactile and somatic level after the treatment.
2. The changes on the skin conductance level before and after the treatment.
3. The therapeutic expectation of the interaction movement by the use of IDS-M.

**A group of patients**

1. A group of patients treated with BRR + EHF 13 patients
2. A group of patients treated only with BRR 28 patients

The result of the second group was objectified by TST and IDS-M before and after the therapy.

The evaluation criterion

Algorithm is a malfunction in three consecutive elements, the first element being initiatory, the second one being peak and the third one transitory. Algorithm is a complex type of malfunction with prevailing malfunction in dynamics.

We differentiate three type of algorithms:

Hypercompositional algorithm is a malfunction in three consecutive elements with a physiological vector but excessive pressure. The highest pressure aims at the transitory element.

Decompositional algorithm is a malfunction in three consecutive elements without a physiological vector. The highest pressure aims at the initiatory element.

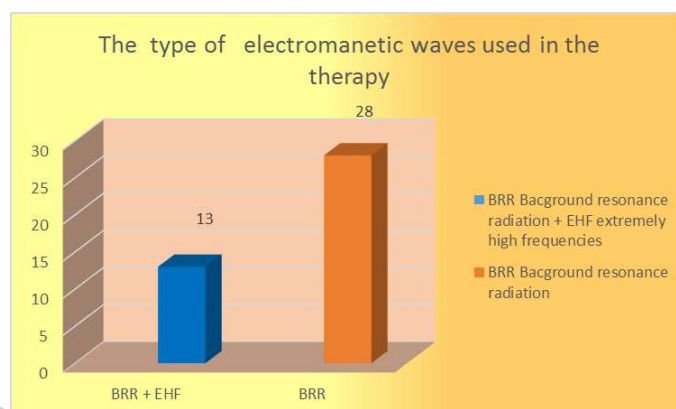
Turbulent algorithm is a malfunction in three consecutive elements, where the vectors do not share an identical direction. The ratio of these directions is 2:1, while two identical vectors determine the characteristics of the algorithm. (1)

If we wanted to evaluate the treatment outcome, we had to take in account the improved condition, whether the decompositional turbulent algorithm changed into the decompositional algorithm or into the hypercompositional algorithm, or whether the hypercompositional algorithm have not changed

and remained hypercompositional. (3)

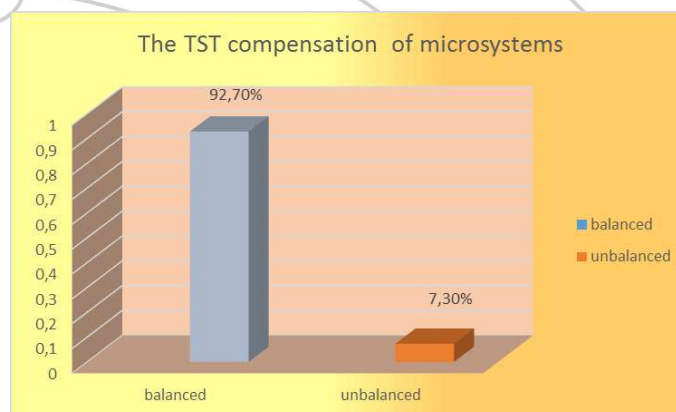
Results

We used the combined type of the therapy by BRR and EHF type in case of 13 patients, and BRR type of the therapy in case of 28 patients.



Graph 1 The type of electromagnetic waves used in the therapy

Out of the 41 patients, the TST compensation of microsystems occurred in 92.7%.



Graph 2 The TST compensation of microsystems after the therapy

Out of all patients, 48, 8% experienced a complete disappearance of the symptoms, 39% experienced regression of the symptoms, and in 12.2% the symptoms remained unchanged.

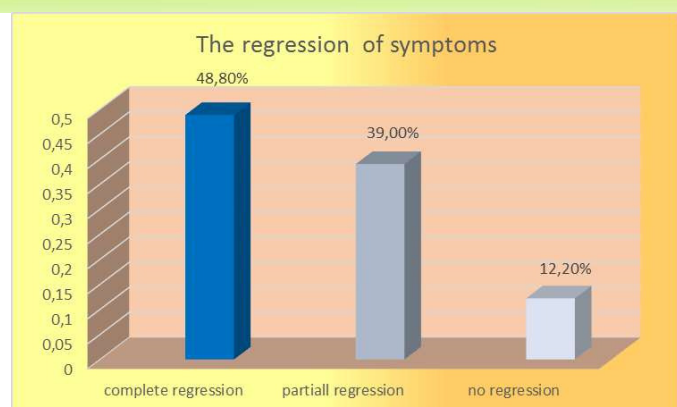
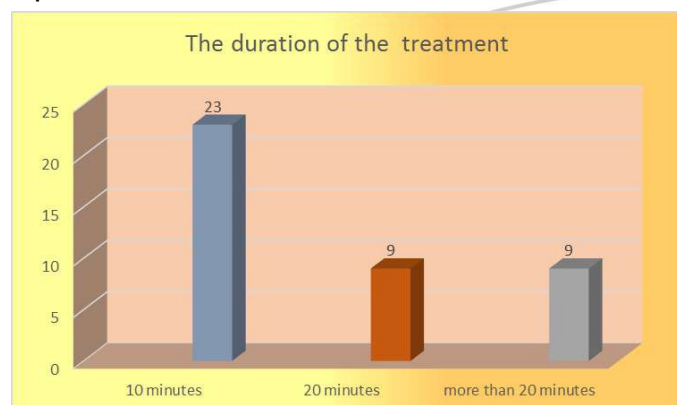


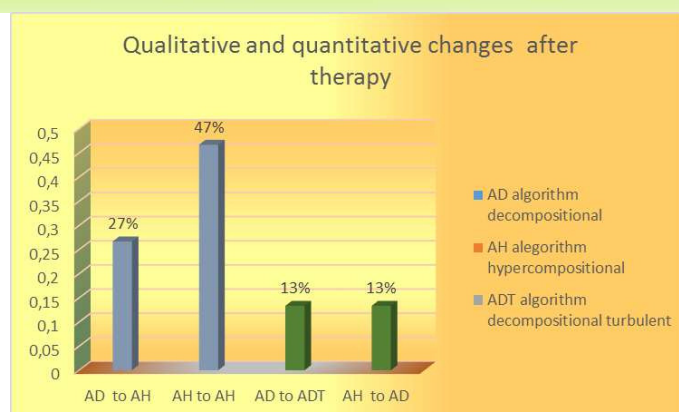
Chart 3 Regression of the symptoms after the therapy

The duration of the treatment using BRR at the place of projected acupuncture point was 10 minutes in case of 23 patients, 20 minutes in case of 9 patients and over 20 minutes in case of 9 patients.



Graph 4 The duration of the therapy

Changes of algorithms based on the above-mentioned evaluation criterion show an improvement in the energy-interactional level in 73%.



Graph 5 Changes of algorithms after the therapy

Discussion

Effects of the electromagnetic background resonance radiation show that the physical influence of the high frequency electromagnetic waves also significantly affects the acupuncture system and bio-morphological level.

In this case we also apply the principle of similarity of the systems in terms of energy-interaction context and the ability to influence such a condition by the use of BRR and AHF electromagnetic waves.

The current view of polymorbidity remains problematic. It is still upon a doctor to decide how to treat such patients. Acupuncture offers a very sophisticated attitude towards the patient. It does not provide an alternative but a solution. The acupuncture diagnostics enables us to evaluate the polymorbidity in energy-interactional context, it offers a treatment as well as a chance to study the acupuncture pathophysiology and gives us feedback on the acupuncture therapy.



Conclusion

We confirmed the hypothesis that in 92.7% the acupuncture BRR therapy affects the tactile sensitivity level of microsystems and in 87.8% we observe an improvement on the somatic level. Changes that occur on the skin conductance level indicate quantitative changes in the tolerance standards and qualitative as well as quantitative changes in algorithms. According to the established evaluation criteria, this leads to an improvement in 73%.

Teodor Mochnáč, M.D., PhD.

Centrum of Acupuncture and diabetic foot

Pod vinohradmi 14A

949 01 Nitra, Slovak Republic

email: tmochnac.akupunktura@gmail.com

Bibliography

1. Solárová, Z. Diagnostické možnosti a perspektívy akupunktúrneho dotazníka podľa autorov Korngolda a Beinfieldovej. 2013. 1, Bratislava : Akupunktúra a prírodná medicína, 2013. ISSN 1339-4703.

2. Fergussonová, K. 2013. Stephen Hawking. Jeho život a dielo. s.l. : Tiskárny Havlíčkov Brod. a.s., 2013. s. 121. ISBN 978-80-7252-449-5.

3. Mochnáč, T. 2014. Diagnostika meridiánového bloku v akupunktúre. www.naturalnamedicina.com. [Online] 2014. ISSN 1339-4703.

4. -. 2011. Rizikové faktory a funkcie komplexných akupunktúrnych dráh vo vzťahu k ochoreniam prsnej žľazy. Bratislava

2011, dizertačná práca : s.n., 2011. s. 70-71.

5. Palúch, S. 2008. Teória informácie. <http://frcatel.fri.uniza.sk/users/paluch/ti.pdf>. [Online] 2008. [Dátum: 25. 8 2013.] ISBN-80-8070-XXX-X.

6. Potekhina, Y., P., Tkachenko, Y., A. 2011. CEM TECH microwave resonance technologies. www.cem-tech.ru. [Online] 2011. [Dátum: 16. 4 2014.]

7. Solár, G. 2011. Hranice poznania dnešnej vedy. Bratislava : LSM, 2011. ISBN 978-80-970500-1-6.

8. Solár, G. Taktilný S test, nová metóda efektívnej akupunktúrnej diagnostiky. 1999. XIX. Congressus Acupuncturae Slovaca et Bohemiae, Košice 1999. s. 27.



NOVINKY na slovenskom trhu

Spoločnosť VitaFit spol. s r.o.

ponúka komplexnú starostlivosť týkajúcu sa maximálneho pohodlia boľavých nôh a ošetrovania kurieho oka. V sortimente máme špeciálne topánky a vložky na rôzne deformácie nôh a výrobky proti plesniam a baktériám.

Ponúkame

Silikónovú podpätenku na päty
a **silikónovú vložku do topánky**
– s podporou priečnej aj pozdĺžnej klenby – proti bolesti preťažených kĺbov a chrbtice. Výrobky sú plne elastické z vysoko kvalitného materiálu. Na Slovensku je to novinka.

Maximálne pohodlie ponúkajú z Anglicka, od firmy Cuxson and Gerrard, dovážané špeciálne vložky s vrstvou z najkvalitnejšej ovčej kože.

- **Celé vložky do topánok – Perfect form** – s podporou pozdĺžnej klenby,
- **vložky do topánok s podporou priečnej klenby – Arch form,**
- **¾ metatarzálné vložky do topánok – Meta form,**
- **podpätenky – Heel form,** s odstrániteľnou strednou časťou pre osoby trpiace výrastkami na päte.

Sviežosť a hygienu nôh pomáhajú udržať špeciálne antibakteriálne a protiplesňové výrobky

- **Sprej proti plesniam** – jeho účinok proti baktériám a plesniam potvrdzuje lekárska prax
- **Trvácne vložky do topánok proti baktériám a plesniam** – navrhnuté pre zmiernenie nárazov, únavy a bolesti, ich antimikrobiálna zložka likviduje baktérie a plesne
- **Trvácne podpätenky proti baktériám**
- **Deo vložky do topánok** – aktívna

Odporúčame tiež vyskúšať spreje na chodidlá a ďalšie produkty, napr. ponožky so strieborným vláknom na každodenné nosenie – aj pre diabetikov! Výrobky majú vysokú kvalitu.

uhlíková vrstva absorbuje zápach, antibakteriálna zložka zastavuje ich rast

- **Pohodlné vložky do topánok** – pomocou penového materiálu zabezpečujú celodenný komfort
- **Výstelky na päty**

Široký sortiment produktov ponúkame aj na prevenciu proti otlakom a pluzgierom

- **Týčinku proti otlakom a pluzgierom**
- **Gélový oddeľovač prstov na nohách**
- **Gélový oddeľovač palca na nohe**
- **Gélové vložky do topánok**
- **Gélový chránič na výčnelok alebo pluzgier** a na ošetrovanie už existujúcich otlakov a pluzgierov
- **Náplasti na otlaky**
- **Zvláčňujúca starostlivosť o otlaky**
- **Tlmiace vankúšiky na výčnelky a pluzgiere**

V našej ponuke nájdete prípravky a výrobky na ošetrovanie kurieho oka

- **Prípravok na odstránenie kurieho oka**
- **Náplasti na kurie oká**
- **Zvláčňujúce náplasti na kurie oká**
- **Tlmiace vankúšiky na kurie oká, oválne a okrúhle**



Výrobky na slovenský trh dodáva:

VitaFit spol. s r.o.

Kontakt: 0905 448 715

www.epredaj.com





**Selected Relations in the MKBD-S Questionnaire
(Korngold – Beinfield Questionnaire Modified
by the Author of the Article)**

Zlatica Solárová M.P. PhD.

Abstract

The author defines theoretical principles of assessment of a modified acupuncture questionnaire devised by Korngold and Beinfield (MKBD-S), which may be used in system acupuncture. In this present paper she takes a detailed focus on more complex malfunctions in the pentagram in the MKBD-S questionnaire, whose interpretation requires the therapist to have several years of clinical experience. She introduces categories such as superalgorithm and some of its variations, a generalized superalgorithm, a triplet and an algorithm. On the example of the Water element, she illustrates categories such as a triplet and an algorithm and some of its physiological and pathological variations.

Keywords: MKBD-S (Modified Korngold – Beinfield Questionnaire According to Solárová), complex acupuncture diagnostics, pentagram, superalgorithm, triplet, algorithm

Introduction

In its analyses the MKBD-S questionnaire points to relations and connections which are universally valid and are not the subject of assessment by the MKBD-S questionnaire only. One of the basic outputs of the questionnaire is

the pentagram. Individual mutual relations in the pentagram, such as the cycle of creation and the cycle of control, are well-known from traditional Chinese medicine too. (Ando, 1995) As we have mentioned several times before, the pentagram is a planimetric model that can provide better possibilities of assessment of relations than the ones described in traditional Chinese medicine. (Ando, 1995) Despite the complexity of this type of observation, the pentagram does not follow a whole on all of its levels but only on those that it is able to project.

This paper is a follow-up to an article published in No. 3 of the e-magazine Acupuncture and Natural Medicine (Solárová, 2014), which briefly explains the assessment of more complex malfunctions in the pentagram in the MKBD-S questionnaire such as a superalgorithm and its forms and a generalized superalgorithm. On the example of the Water element, we will show how a triplet and an algorithm work, how they are defined in this context and what difference there is between them. The description of relations in the pentagram is important for more accurate assessment by the questionnaire as well as for gaining a deeper insight into the relations and connections in the pentagram.

Material and methodology

On the basis of past clinical experience, as well as on the basis of a deeper analysis of relations in

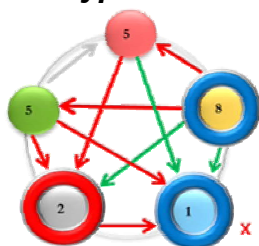


the pentagram, we have focused on more complex types of malfunction and their definition in the MKBD-S questionnaire, algorithms whose combinations constitute:

1. **Superalgorithm**
2. Paired superalgorithm
3. **Generalized superalgorithm**

Definitions

Superalgorithm – a malfunction in the exchange of information between **three** consecutive **algorithms** in the energy-informational system. It is a combined qualitative–quantitative type of malfunction. **Superalgorithm** arises if **two consecutive elements have an equal value and the other elements have different values from each other, but also from the elements with the equal value**. See, for example, the percentile value of the element of Wood 5 and the percentile value of the element of Fire 5 (Picture 1). The algorithm is marked with a coloured circle; depending on the type of malfunction it is either blue, red or green (Picture 1). **The prevalent malfunction is the one of stability mainly of the Yin type** – the relation of control.



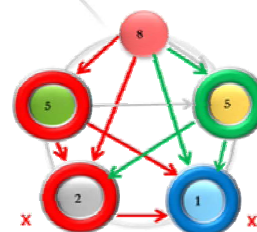
Picture 1 Turbulent hyper-compositional superalgorithm of the Metal element

Caption: Turbulent hyper-compositional

superalgorithm of the Metal element (the second algorithm in order, marked with the numeral 1, circled in blue)

Paired superalgorithm – a malfunction in the exchange of information between **four** consecutive **algorithms** in the energy-informational system. It is a combined qualitative–quantitative type of malfunction. **Paired superalgorithm** arises if **two non-consecutive elements have an equal value and the other elements have different values from each other, as well as from the elements with the equal value**. See, for example, the percentile value of the element of Wood 5 and the percentile value of the element of Earth 5 (Picture 2).

The prevalent malfunction is that of dynamics mainly of the Yang type (in two consecutive elements, the relation of creation). The algorithm is marked with a coloured circle; depending on the type of malfunction, it is either blue, red or green (Picture 2).

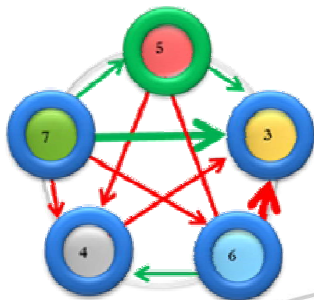


Picture 2 Turbulent hyper-compositional superalgorithm of the Metal element, pure decompositional of the Water element – paired

Caption: Turbulent hyper-compositional superalgorithm of the Metal element (the second algorithm in order, marked with the numeral '1', circled in blue), pure decompositional of the Water element (the third algorithm in order, marked with the numeral '2', circled in red)



Generalized superalgorithm – a malfunction in the exchange of information in the whole pentagram, in the whole energy-informational system. It is a complex type of malfunction in the pentagram (Picture 3). **A malfunction of dynamics mainly of the Yang type** (in two consecutive elements, the relation of creation) **and of stability mainly of the Yin type** (the relation of control) **are balanced**.



Picture 3 Relations in the pentagram – Generalized superalgorithm

Caption: Generalized superalgorithm: each of the elements displays a malfunction; the colour of the circle (blue, green) depends on the type of malfunction. Malfunctions are considered as a whole and are not listed separately as algorithms of elements.

On the following example of the Water element we will demonstrate the assessment of physiology (triplet) and pathology (algorithm) of three consecutive elements in the pentagram.

The triplet¹ refers to a **physiological process** of three consecutive elements in the pentagram. Each element can be gradually found in three positions – initiatory (first), peak (second, the most stable), transitory (third). The

most stable element in the triplet is the peak triplet. Vectors of forces are balanced, but the percentile value of each element in the triplet is the same. (Picture 4)

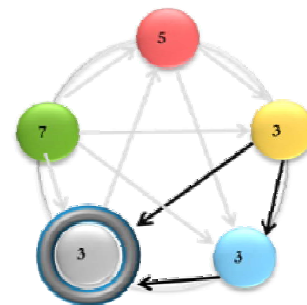
The algorithm² refers to a **pathological process** of three consecutive elements in the pentagram, where the direction of individual vectors displays pathology. Pathology occurs if the percentile value of each element in the algorithm is not the same.

Each element in the pentagram can be gradually found in three positions:

- initiatory (first)
- peak (second)
- transitory (third)

The Water element is observed as a triplet and an algorithm in the pentagram as follows:

- a) **transitory element, Earth–Metal–Water**, which begins in the Earth element, continues to the Metal element and then to the Water element (Picture 4, 5)

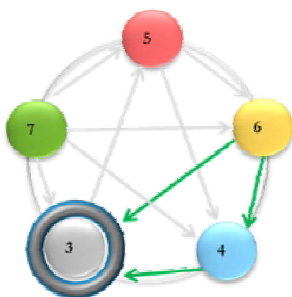


Picture 4 Triplet – Water element – transitory element

¹ A triplet in general: a unit consisting of three elements

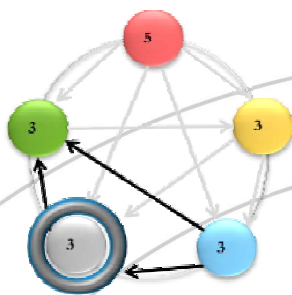
² An algorithm is a finite sequence of precisely defined instructions aimed at the completion of a certain task.

³ For types of algorithm (Solárová, 2014)

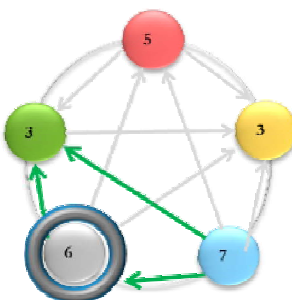


Picture 5 Algorithm – Water element as a transitory element

- b) peak element Metal–Water–Wood, which begins in the Metal element, continues to the Water element and then to the Wood element (Picture 6,7).



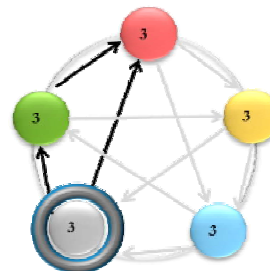
Picture 6 Triplet – Water element – peak element



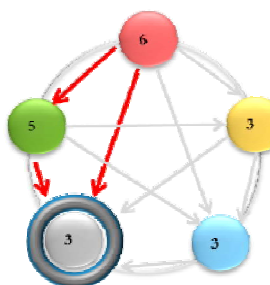
Picture 7 Algorithm – Water element as a peak element

- c) initiatory element Water–Wood–Fire, which begins to grow in the Water element, continues through the Wood element and ends in the Fire element

(Picture 8,9).



Picture 8 Triplet – Water element – initiatory element



Picture 9 Algorithm – Water element – initiatory element

Discussion

To diagnose malfunctions in acupuncture, we use the MKBD-S questionnaire where malfunctions in the exchange of information are referred to as algorithms and superalgorithms, whether turbulent or pure. The extent of each malfunction speaks either of quality or quantity.

Each of the mentioned malfunctions is an explanation for another type of malfunction in the process of information exchange – from the point of view of the MKBD-S questionnaire it is a malfunction of relations. **Relations** in the pentagram are apt terminological denominations, for example, **the relation of creation**: a mother bears a son. This term symbolically conveys the fact that all processes in the pentagram involve a **complex exchange**



of information. They are **a complex info-interactive phenomenon**. We can say that the processes in the pentagram interact mutually in the harmonic or pathological sense.

There are many ways of how a malfunction can occur, but all of them have something in common: **they are a malfunction of interaction**. Since a human being is a complex multi-level entity, the processes of information exchange are also complex and multi-level. If pathology occurs, it means that a person's "software", or occasionally even "hardware", has malfunctioned.

In this respect, even the theoretical explanation of triplets and algorithms on the example of the Water element, which we have described, is not expressive of and cannot be perceived as an absolute characteristic of the Water element, but only as a part of a functional whole. There is not a sufficient amount of literature on new relations in the pentagram because traditional relations in the pentagram are considered generally, or at least mostly, accepted, and the relations we have mentioned have not yet received adequate treatment in literature.

Conclusion

The newly established notions in the assessment of the pentagram are important not only for the assessment of the MKBD-S questionnaire, but they also extend the view of the pentagram as the best-known planimetric model of relations and connections in acupuncture and allow its more detailed and

complex analysis. It is necessary that these new criteria be incorporated in clinical studies, which will evaluate their contribution to practice.

Zlatica Solárová M.P. PhD.

The First Clinic of Acupuncture and Natural Medicine of G.Solar s.r.o.

Ivánska cesta 23

Bratislava

Slovakia

www.akupunktura.sk

e-mail: klinika@akupunktura.sk

Bibliography

1. Ando, V. 1995. *Klasická čínska medicína – základy teórie I*. Hradec Králové : Svítaní, 1995. ISBN 80-901788-1-2.
2. Solárová, Z. 2014. *Teoretické základy procesu diagnostiky v dotazníku MKBD-S*. In *Akupunktúra a naturálna medicína* Bratislava: LSM, 2014, 3. ISSN 1339-4703.
3. Wikipédia. 2014. wikipédia. [Online] 2014. [Dátum: 2. január 2014.] <http://sk.wikipedia.org/wiki/Algoritmus>.
4. Wikipédia. 2014. wikipédia. [Online] 2014. [Dátum: 2. január 2014.] <http://sk.wikipedia.org/wiki/Triplet>.



dōTERRA®

Independent Product Consultant

CPTG Certified Pure Therapeutic Grade®

Essential Oils

"Pure essential oils are appealing to a wider audience because of their potency, safety, and affordability. CPTG Certified Pure Therapeutic Grade® essential oils are highly regarded for their ability to address everything from serious infections to everyday health challenges,"

said Dr. David K. Hill, doTERRA's Chief Medical Advisor

Essential oils doTERRA – for connecting traditional and alternative medicine, is committed to sharing the life-enhancing benefits of CPTG Certified Pure Therapeutic Grade® essential oils and essential oil-enhanced wellness products with the world.



For details, please visit www.doterra.com
or dial +421 907 718 958 or +421 948 335 011

Editorial office is not responsible for the content of advertisements.



**Anti-inflammatory Effect of Morindae
Officinalis Radix Water Extract in LPS-induced
RAW 264.7 Mouse Macrophages**
Wansu Park, MD, PhD., et al

Abstract

Morindae Officinalis Radix (MO, the root of *Morinda officinalis* How, Family Rubiaceae), named as “Pa-Guk-Chun”, has long been used traditionally as medicinal herb due to its estrogenic properties in Korean Medicine. In 'Donguibogam', the most famous Korean Medical classic, it was suggested that Morindae Officinalis Radix could treat syndromes of kidney-yang deficiency such as spermatorrhea, frequent urination, sterility, enuresis, impotence, and cystitis. In the present study, our experimental evidences represent that MO inhibits production of proinflammatory mediators such as NO, G-CSF, GM-CSF, and CXCL5/LIX in LPS-induced RAW 264.7 mouse macrophages with increasing cell viability in LPS-induced RAW 264.7 mouse macrophages. These findings suggest that MO possesses anti-inflammatory properties and could modulate macrophage-mediated hyper-inflammation.

Keywords: *Morinda officinalis*, macrophage, anti-inflammation, nitric oxide, cytokine

Introduction

Morindae Officinalis Radix (MO, the root of *Morinda officinalis* How, Family Rubiaceae), named as “Pa-Guk-Chun”, has long been used traditionally as medicinal herb due to its estrogenic properties in

Korean Medicine. In 'Donguibogam', the most famous Korean Medical classic, which was designated as a world documentary heritage by UNESCO in 2009, it was suggested that Morindae Officinalis Radix could treat syndromes of kidney-yang deficiency such as spermatorrhea, frequent urination, sterility, enuresis, impotence, and cystitis (Huh, 2006).

Macrophages play a central role in the inflammatory response and serve as an essential interface between innate and adaptive immunity (Maruotti et al., 2007; Lee et al., 2009).

Of the numerous molecules needed to guide cell movements during the initiation of adaptive immune responses, the chemotactic cytokines, or chemokines, have perhaps the most pervasive influence (Cyster, 2005). Cytokines and growth factors are the major orchestrators of host defense processes and, as such, are involved in responses to exogenous and endogenous insults, repairs and restoration of homeostasis (Gutierrez-Ruiz et al., 2001). Chemokines and their receptors play a central role in the inflammatory recruitment of leukocytes and other cell types (Sospedra et al., 2005). Macrophages play an important role in inflammatory disease through the release of factors such as nitric oxide (NO), prostaglandin mediators, and cytokines involved in the immune response (Adams et al., 1984).

But Excessive and continuing production of cytokine, chemokine, and growth factor in response



to bacterial lipopolysaccharides (LPS) or superantigens is a hallmark of the systemic inflammatory response, which can be life-threatening, and dissemination of these bacterial products induces waves of proinflammatory cytokines that cause vascular injury and multiple organ dysfunction (Hawiger, 2001).

In the current study, the anti-inflammatory effects of the water extract of *Morindae Officinalis Radix* were investigated using RAW 264.7 mouse macrophages induced by LPS.

Material and methodology

Morindae Officinalis Radix was purchased from Omniherb Company (Daegu, Korea) and a voucher specimen (No. 2012-10-002) was deposited at the College of Korean Medicine, Gachon University Herbarium. Traditionally, herbal medicines have been extracted by water in Korean Medicine, MO was extracted with boiling water for 2 hr, filtered, and then lyophilized (Yoon et al., 2009). RAW 264.7 mouse macrophages were purchased from the Korea Cell Line Bank (Seoul, Korea) and cultured in humidified incubator. Cell viability was assessed using a modified MTT assay (Mosmann, 1983). NO concentration in the cultured medium was determined via the Griess reaction (Weissman et al., 2001). Cytokines released from treated Raw 264.7 cells were measured in the cell culture supernatants using a Luminex assay based on xMAP technology (Elkord et al., 2005; Yoon et al., 2009). This Luminex assay was performed with a Bio-Plex 200 suspension array system (Bio-Rad, USA) and Millipore cytokine assay kits (Millipore, USA). Standard curves for each cytokine (G-CSF,

GM-CSF, LIX, interleukins, M-CSF etc.) were generated using the kit-supplied reference cytokine samples. Statistical analysis was done with an analysis of variance and a Student's t-test using SPSS 11.0 software (SPSS Inc., USA).

Results and Discussion

Physical barriers and immune defense systems have evolved to protect the host from microbial invasion and acute inflammation is a response to infection or cellular disturbances by other means such as trauma (Bauernfeind et al., 2013).

The LPS, endotoxin derived from the outer membrane of gram-negative bacteria, is known to strongly stimulate macrophages to produce proinflammatory mediators such as NO, cytokine, chemokine, growth factors, prostaglandins, and reactive oxygen species (Kim et al., 2012; Raetz, 1990) as well as to provoke the inflammation-related programmed cell death such as apoptosis and pyroptosis. Specifically, pyroptosis, which was firstly named by Cookson and Brenna in 2001 (they proposed that the term 'pyroptosis' from the Greek roots pyro, relating to fire or fever, and ptosis (to-sis) to denote a falling, to describe proinflammatory programmed cell death.), is thought to be a particular form of cell death in macrophages, which is induced by bacterial infection, and hence releases pyrogenic interleukins (Kepp et al., 2010).

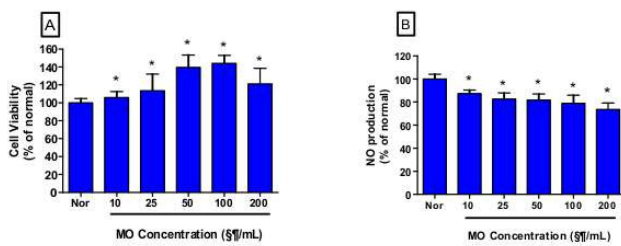


Figure 1. Effects of MO on the cell viability (A) and NO production (B) in RAW 264.7 mouse macrophages. Cell viability was evaluated with MTT assay and expressed as a percentage of the normal (Nor; medium only) after 24 hr treatment, while NO production with Griess reaction assay. Values are the mean \pm SD of more than three independent experiments.

* $P < 0.05$ vs. normal.

Cookson and Brenna (2001) speculated in their short and clear article, “We envision the evolution of a proinflammatory program to remove potentially dangerous cells, like the process that takes the life of *Salmonella*-infected macrophages. This is an alternative pathway from simply and quietly removing an unwanted cell in a developing organism – the screaming, alarm-ringing pro-inflammatory death of a potentially dangerous cell in an organism where the prompt recruitment of additional cells or cellular functions are necessary to promote a positive outcome for the host”. And they also suggested that pyroptosis is dependent on caspase-1 activation and various inflammasomes in contrast to apoptosis.

Bauernfeind et al. (2013) have reported that inflammasome complexes can be formed by members of the Nod-like receptor family or the PYHIN family member AIM2 and, upon formation, inflammasomes trigger proteolysis of caspase-1, which subsequently leads to a potent inflammatory

response through the maturation and secretion of IL-1 family cytokines, which can be accompanied by an inflammatory cell death termed pyroptosis.

Jovanović et al. (2007) have reported that inflammation is mediated by a variety of soluble factors, including the complement system, the clotting system, the kinin system, and the cell-derived mediators which include histamine and serotonin, platelet activating factor, arachidonic acid metabolites (prostaglandins, leukotrienes, lipoxins), NO, and cytokines (regulators of host responses to infection, inflammation and immune responses).

Although inflammation is necessary to react to microbial invasion, the uncontrolled inflammation can also lead to a host of diseases. Thus, anti-inflammatory effect of herbal medicine is attracting the attention due to its safety and efficiency.

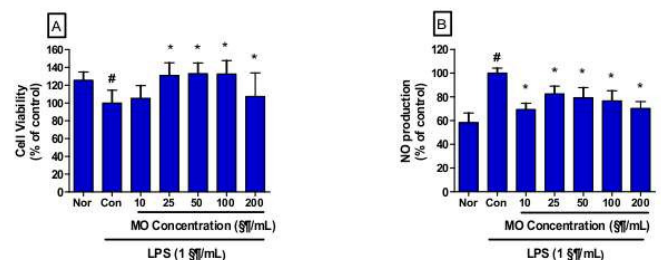


Figure 2. Effects of MO on the cell viability (A) and NO production (B) in LPS-induced RAW 264.7 mouse macrophages. Cell viability was evaluated with MTT assay and expressed as a percentage of the control (Con; 1 μ g/mL of LPS alone) after 24 hr treatment, while NO production with Griess reaction assay. Values are the mean \pm SD of more than three independent experiments. # $P < 0.05$ vs. Nor (medium only); * $P < 0.05$ vs. Con.

Gądek-Michalska et al. (2013) have reported that Inflammatory responses in the brain contribute to



cellular damage associated with neuropsychiatric diseases related to stress: Physical, psychological or combined-stress conditions evoke a proinflammatory response in the brain and other systems, characterized by a complex release of several inflammatory mediators including cytokines, prostanoids, transcription factors, and NO. Specifically, NO participates in multiple interactions between neuroendocrine and neuroimmune systems in physiological and pathological processes including signal transduction pathways that result in the release of corticosterone from the adrenal gland: In detail, due to its ability to freely cross cell membranes, NO can act in both autocrine and paracrine pathways involving targets that are relatively distant from its site of origin, and hence NO generated in response to stress exposure is associated with depression-like and anxiety-like behaviors: The complex responses of central and peripheral pathways to acute and chronic stress involve cytokines, NO and PG systems that regulate and turn off responses that would be potentially harmful for cellular homeostasis and overall health.

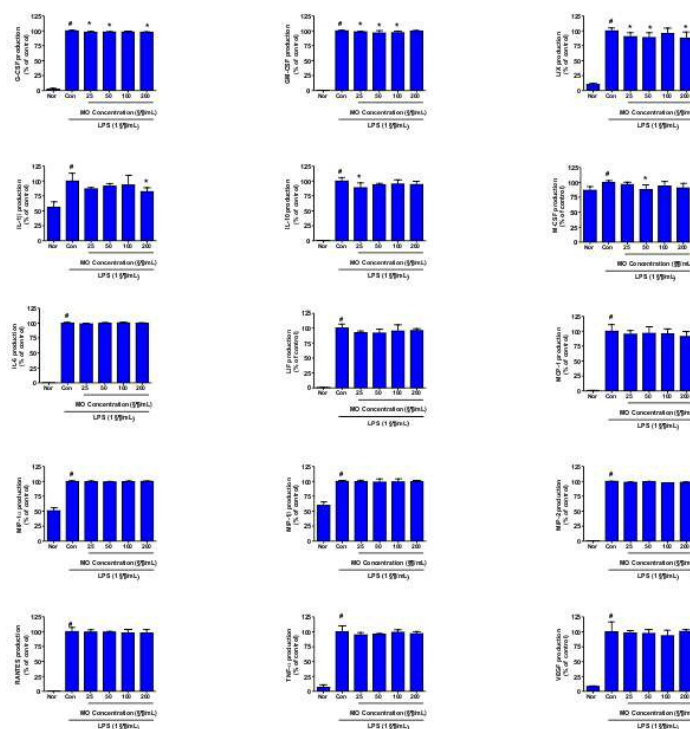


Figure 3. Effects of MO on cytokine production (i.e., G-CSF, GM-CSF, LIX, IL-1 β , IL-10, M-CSF, IL-6, LIF, MCP-1, MIP-1 α , MIP-1 β , MIP-2, RANTES, TNF- α , and VEGF) in LPS-induced RAW 264.7 mouse macrophages. Concentration of various cytokines in the culture medium was measured by Multiplex bead-based cytokine assay after 24 hr treatment. Values are the mean \pm SD of more than three independent experiments. # $P < 0.05$ vs. Nor (medium only); * $P < 0.05$ vs. Con (1 μ g/mL of LPS alone).

Kim et al. (2005) have reported that the methanol extract of the roots of *Morinda officinalis* potently inhibits the nuclear factor- κ B activation and the production of NO, prostaglandin E2, and tumor necrosis factor- α in LPS-induced RAW 264.7 mouse macrophages; the expression of inducible nitric oxide synthase and cyclooxygenase-2 at the protein level, and of inducible nitric oxide synthase, and



cyclooxygenase-2, and tumor necrosis factor- α at the mRNA level, is also inhibited in a concentration-dependent manner.

Recently, Shin et al. (2013) have reported that monotropein isolated from the roots of *Morinda officinalis* is found to inhibit the expressions of inducible nitric oxide synthase, cyclooxygenase-2, tumor necrosis factor- α , and interleukin-1 β mRNA in LPS-induced RAW 264.7 mouse macrophages; decreases the DNA binding activity of nuclear factor- κ B; suppresses phosphorylation and degradation of inhibitory κ B- α , and consequently the translocations of the nuclear factor- κ B.

But anti-inflammatory effect of MO in LPS-induced RAW 264.7 mouse macrophages has not yet been reported fully. Thus, we investigated the anti-inflammatory effects of MO using RAW 264.7 mouse macrophages induced by LPS in the current study.

MO showed no cytotoxicity against RAW 264.7 mouse macrophages and inhibited NO production of RAW 264.7 mouse macrophages (figure 1). Rather, MO increased cell viability in LPS-induced RAW 264.7 mouse macrophages (figure 2). And MO also inhibited NO production in LPS-induced RAW 264.7 mouse macrophages (figure 2). These results suggest that MO might relieve the phenomena of pyroptosis in LPS-induced RAW 264.7 mouse macrophages.

Kierstein et al. (2008) have reported that allergic airway inflammation could be characterized by increased interleukin-5, GM-CSF, and G-CSF protein levels. Tateda et al. (2001) have reported that increased levels of KC, MIP-2, and LIX proteins are observed in the lungs of mouse model of *Legionella pneumophila* pneumonia.

In the present study, MO significantly inhibited the production of G-CSF, GM-CSF, and LIX in LPS-induced RAW 264.7 mouse macrophages (Figure 3). Additionally, MO represented partially significant inhibition on the production of some cytokines such as interleukin-1 β , interleukin-10, and M-CSF in LPS-induced RAW264.7 mouse macrophages (figure 3).

In conclusion, with these experimental evidences, MO could be thought to have anti-inflammatory activity related with increasing cell viability and inhibiting the production of NO, G-CSF, GM-CSF, and LIX in LPS-induced RAW 264.7 mouse macrophages.

Conclusion

Although the precise mechanisms regulating the anti-inflammatory activity of MO are not yet known, in the present study our experimental evidences represent that MO inhibits production of proinflammatory mediators such as NO, G-CSF, GM-CSF, and CXCL5/LIX in LPS-induced RAW 264.7 mouse macrophages with increasing cell viability. These findings suggest that MO possesses anti-inflammatory properties and could modulate macrophage-mediated hyper-inflammation. Further studies are needed to verify the precise mechanism regulating anti-inflammatory activities of MO.

Wansu Park, MD, PhD.

Young-Jin Kim

Hyun-Ju Kim

College of Korean Medicine, Gachon University,
Seongnam, Kyunggi-do, Republic of Korea



Bibliography

1. Huh J. 2006. Donguibogam. Seoul : Donguibogamchulpansa, 2006 , pp. 50-51.
2. Maruotti, N. – Cantatore, F.P. – Crivellato, E. – Vacca, A. – Ribatti, D. 2007. Macrophages in rheumatoid arthritis. *Histol Histopathol.* 2007, vol 22, no. 5, pp. 581-586.
3. Lee, H.J. et al. 2009. Two enone fatty acids isolated from *Gracilaria verrucosa* suppress the production of inflammatory mediators by down-regulating NF- κ B and STAT1 activity in lipopolysaccharide-stimulated RAW 264.7 cells. *Arch Pharm Res.* 2009, vol. 32, no. 3, pp. 453-462.
4. Cyster JG. 2005. Chemokines, sphingosine-1-phosphate, and cell migration in secondary lymphoid organs. *Annu Rev Immunol.* 2005, vol. 23, 127-159.
5. Gutierrez-Ruiz, M.C. 2001. Cytokine response and oxidative stress produced by ethanol, acetaldehyde and endotoxin treatment in HepG2 cells. *Isr Med Assoc J.* 2001, vol. 3, no. 2, pp. 131-136.
6. Sospedra, M. – Martin, R. 2005. Immunology of multiple sclerosis. *Annu Rev Immunol.* 2005, vol. 23, pp. 683-747.
7. Adams, D.O. – Hamilton, T.A. 1984. The cell biology of macrophage activation. *Annu Rev Immunol.* 1984, vol. 2, pp. 283-318.
8. Hawiger, J. 2001. Innate immunity and inflammation: a transcriptional paradigm. *Immunol Res.* 2001, vol. 23, no. 2-3, pp. 99-109.
9. Yoon, S.B. et al. 2009. Anti-inflammatory effects of *Scutellaria baicalensis* water extract on LPS-activated RAW264.7 macrophages. *J Ethnopharmacol.* vol. 125, no. 2, pp. 286–290.
10. Mosmann, T. 1983. Rapid colorimetric assay for cellular growth and survival: application to proliferation and cytotoxicity assays. *Journal of Immunological Methods*, vol. 65, pp. 55–63.
11. Weissman, B.A. - Gross, S.S. 2001. Measurement of NO and NO synthase. *Current Protocols in Neuroscience*, 2001, Chapter 7:Unit 7.
12. Elkord, E. - Williams, P.E. - Kynaston, H. - Rowbottom, A.W. 2005. Human monocyte isolation methods influence cytokine production from in vitro generated dendritic cells. *Immunology*, 2005, vol. 114, pp. 204–212.
13. Kim, H.K. et al. 2012. Immunomodulatory effects of *liriope platyphylla* water extract on lipopolysaccharide-activated mouse macrophage. *Nutrients*, 2012, vol. 4, no. 12, pp. 1887-1897.
14. Raetz, C.R. 1990. Biochemistry of endotoxins. *Annu Rev Biochem.* 1990, vol. 59, pp. 129–170.
15. Cookson, B.T. - Brennan, M.A. 2001. Pro-inflammatory programmed cell death. *Trends in Microbiology*, 2001, vol. 9, no. 3, pp. 113–114.
16. Kepp, O. – Galluzzi, L. – Zitvogel, L. – Kroemer, G. 2010. Pyroptosis - a cell death modality of its kind ? *Eur J Immunol*, 2010, vol. 40, no. 3, pp. 627-630.
17. Bauernfeind, F. – Hornung, V. 2013. Of inflammasomes and pathogens—sensing of microbes by the inflammasome. *EMBO Mol Med*, 2013, vol. 5, no. 6, pp. 814-826.
18. Jovanović, Z. – Ilić, M. – Janković, S. 2007. Pathogenic mechanisms in the development of surgical site infections. *Med Pregl*, 2007, vol. 60, no. 7-8, pp. 343-350.



19. Gądek-Michalska, A. – Tadeusz, J. – Rachwalska, P. – Bugajski, J. 2013. Cytokines, prostaglandins and nitric oxide in the regulation of stress-response systems. *Pharmacol Rep*, 2013, vol. 65, no. 6, pp. 1655-1662.

20. Kim, I.T. et al. 2005. In-vitro and in-vivo anti-inflammatory and antinociceptive effects of the methanol extract of the roots of *Morinda officinalis*. *J Pharm Pharmacol*, 2005, vol. 57, no. 5, pp. 607-615.

21. Shin, J.S. et al. 2013. Monotropein isolated from the roots of *Morinda officinalis* ameliorates proinflammatory mediators in RAW 264.7 macrophages and dextran sulfate sodium (DSS)-induced colitis via NF- κ B inactivation. *Food Chem Toxicol*, 2013, vol. 53, pp. 263-271.

22. Kierstein, S. 2008. Ozone inhalation induces exacerbation of eosinophilic airway inflammation and hyperresponsiveness in allergen-sensitized mice. *Allergy*, 2008, vol. 63, no. 4, pp. 438-446.

23. Tateda, K. 2001. Chemokine-dependent neutrophil recruitment in a murine model of *Legionella* pneumonia: potential role of neutrophils as immunoregulatory cells. *Infect Immun*. 2001, vol. 69, no.4, pp. 2017-2024.



Iplikator

Iplikator is designed for individual use. Its idea finds its roots in traditional Chinese medicine, and can be related to the practice of "MEI HUA CHENG" also known as "Peking Hammer". The ipikator brings relief to sufferers of joint, muscle and back pains, insomnia. It also enhances the body's regeneration and increases vitality. The ipikator releases the body's natural resistance to pain. The range of uses of the ipikator is vast, in both prevention and treatment.

Benefits:

Simplicity of the used technique.

Possible absence of specialist in acupuncture.

Any frequency of treatment according to the patient's condition and consideration.

Immediate effect.

It is suitable accompaniment of range of physical therapy.

www.ipikator.eu ipikator@dodo.sk

It has been used successfully to:

- ✓ prevent, eliminate or reduce pain radiculitis or osteochondrosis
- ✓ eliminate inflammation and joint pains, ncrease flexibility of joints
- ✓ eliminate muscular crampsОтстранение
- ✓ overcome sleeplessness



Editorial office is not responsible for the content of advertisements.



Water from environmental geochemist's point of view

Doc. RNDr. Miloslav Khun, CSc.

Abstract

This contribution presents essential forms of water appearing on Earth

from abundance point of view, as its partition in the hydrosphere. Essence of this contribution is impacts assessment on human, which are mediated by the water. Attention is devoted to essential feature of all waters - to concentration of dissolved substances in the categories of drinking and wastewater. In the centre of attention is the greatest endemic poisoning with arsenic in modern history – Bangladesh, where e.g. 57 millions inhabitants (out of 142 million inhabitants) are endangered by arsenic from drinking water. In the field of negative effects of wastewater on human health we refer about known poisonings in Japan – with mercury (Minamata disease in Minamata Bay) and with cadmium (itai-itai disease in Jinzu River basin, the Toyama Prefecture).

Keywords: hydrosphere, dissolved substances, effect on human health, endemic poisonings

Water is an inevitable condition for life existence on Earth. We often say that water means life. Our body „runs“ upon water, practically every cell swims in it. Water covers nearly 71 % of all earth surface. Total water

quantity is estimated to 1.440 millions km³ on Earth in all forms (Table 1). Only 2,8 % from this amount is freshwater. Most of this water is bound in icebergs of polar regions and mountain glaciers. Only 0,27 % of freshwater is suitable for production of drinking water. Water in the nature is exhaustless in quantity and indestructible, but its quality is damageable. Hippocrates (460-377 B.C.) calls the attention of his colleagues to relation between water quality and population health as early as four centuries before Christianity.

	Volume (10 ³ km ³)	Vol % .
Ocean waters		
oceans and seas	1 360 000	94,7
void water of submarine sediments	36 200	2,5
Continental waters		
freshwater lakes	130	0,009
salt lakes	105	0,007
rivers, momentum quantity	1,25	0,00009
basins and swamps	11	0,0008
subsurface water	4 065	0,28
- to depth	4 000	0,28
- to depth more then		
Water in atmosphere	13	0,0009
Icebergs and snow	32 000	2,2
Total	1 436 425	

Table 1 Distribution of water in the hydrosphere (Netopil, 1972)



We know 6 water categories according to form of abundance of water on the Earth: **ocean waters:** 1. sea waters, 2. void waters in the bottom sediments; **continental waters:** 3. surface waters of continents, 4. subsurface waters of continents; 5. **atmospheric water** and 6. **water in the form of ice.**

Water has an essential function in geochemical and biochemical processes. It's also main carrier of all chemical elements, its quantity and composition controls cycles of elements in the water-air-soil system. Due this fact water is the most studied part of environment which includes various forms of trace elements – objects of interest are especially Cr, Se, Cu, As, Pb, Cd and Hg. Basic attribute of all waters is the concentration of dissolved substances in it. Main anorganic ions are ammonium, nitrite and phosphoric. In accessory amounts there are Li, Mn, Ba, Sr, F, Br, I and metals Al, Cu, Pb, Zn, Se, Hg, Cr, As and others as well as gases nitrogen, oxygen, radon or gaseous hydrocarbons as methane. Out of organic substances there are hydrocarbons, amino-acids, lipids and numerous macro- and microorganisms. Anthropogenic substances such as phenols, pesticides are increasingly getting into the water. Based on the last UNO data almost a billion of people don't have an access to clear drinking water. The situation will be worse due to growing population.

Let's have a look to some case studies of endemic poisonings by potential toxic trace elements As, Hg and Cd in the world:

Most of rural population in Bangladesh used

surface waters for drinking and cooking purposes in the beginning of year 1970. About a quarter of billion children died annually due diseases caused by consumption of these waters (World Bank Group, 1999 in Adriano, 2001). Providing drinking water from tubewells for 97 % rural population decreased the incidence of diarrheal diseases and reduced children mortality by half. Paradoxically, same wells that saved so many existences, cause nowadays health damages in consequence of high content of As in the water. Since those wells have not yet been tested for As levels, millions of inhabitants in Bangladesh face a decision either to continue drinking water from As contaminated wells or go back to use surface water and risk diarrhoea and another diseases.

The problem of high contents of As in many shallow and deep wells in Bangladesh was identified in the year 1993 and consecutively confirmed in the year 1995 (World Bank Group, 1996 in Adriano, 2001). 57 millions of Bangladesh inhabitants (out of 142 millions of inhabitants) are at risk – they use drinking water with the content of arsenic more then 0,01 mg.ml⁻¹. Every fifth death is due to cancer caused by excess of arsenic in drinking water. This is the greatest endemic poisoning in the history.

This contamination by As is unprecedented. There are some cases of geological contamination by arsenic in other parts of world, inclusive neighbouring Western Bengal. However, these contaminations are specific and affect restricted number of people. Figure 1 shows Bangladesh population exposed to high concentrations of arsenic in drinking water.

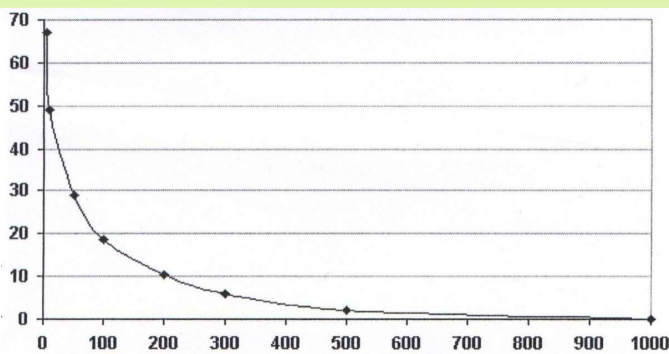


Figure 1 Concentration of As ($\mu\text{l-1}$) in drinking water (X-coordinate) versus exposed Bangladesh population ($\times 10^6$) to excess of As in used drinking water (Y-coordinate). Source: Kinniburgh and Smedley (2000)

Arsenic is a silent killer. The poisoning is invisible in its early phases. Effects of As poisoning on human health manifest after 8 to 14 years depending on the quantity of ingested As, nutritional conditions and immune status of affected people. From certain point it's possible to fight against contamination by using drinking water without arsenic. Symptoms of As poisoning range from dermal pigmentation, warts, diarrhoea and abscesses in its early stages. In severe cases As poisoning causes insufficient function of liver and kidney up to cancer, which causes death in affected people. An arsenic poisoning is not easy to detect because capacity and resources for diagnostics are insufficient. Only few of affected people with arsenicosis can be easily identified based on the state of their skin. Some thousands of patients were diagnosed in Bangladesh with skin disease due to As poisoning in the first stages up to the present day. Available data on mortality

rate due to As poisoning is rare. Dozens of deaths due to skin cancer have been reported in recent years. Since most of wells in rural areas have been installed in the last twenty or thirty years, it is very probable that the symptoms of As poisoning will manifest in the next few years (Thornton, 1996).

Social consequences of As crisis are tragic. Many people consider the skin related symptoms of As poisoning as leprosy (Hansen's disease) due to lack of information. In most of affected villages these people are isolated, they are not allowed to join social activities and they are rejected by their closest relatives. Women can't get married, married women are abandoned by their husbands. Children with such symptoms do not attend school.

It is necessary to search for the origin of As in pyrite or arsenopyrite that is released by weathering of migmatites and granitoids constituting the core of Himalaya. Arsenic from the arsenopyrite is quite easily disintegrated and consequently passes to the solution but it is immediately adsorbed on Mn and Fe hydroxides. These As-rich compositions are quickly superimposed by the following sediments and arsenic is by this manner „paralysed“ in long-term. But in Bangladesh there is a mechanism that deeper buried sediments with high content of organic matter plunge into reducing conditions. So local particularly lithotrophic bacteria can't breathe oxygen from groundwaters. They



consume the oxygen by oxidation of organic matter from Fe hydroxides instead and transform Fe^{3+} to Fe^{2+} . Arsenic is during this transformation, that is in fact iron dissolution, released and adsorbed to the groundwater. Since surface waters have been substituted by wells built up by the international commissions as source of drinking water, inhabitants started to use this contaminated source of water. It can be said that the most important expositional path for arsenic is ingestion of drinking water. Tragical measure of this situation is the fact that after 30 years of half-baked international assistance we are confronted with the greatest endemic poisoning in the human history.

The so-called Minamata disease was first the case of endemic intoxication in a large region and in a large number of patients. Its designation originates in a locality, where the disease occurred. Minamata is situated in Japan at southern border of Kumamoto Prefecture that borders with Kagoshima Prefecture. The disease was caused by methyl mercury in wastewater that was discharged from a chemical factory into the sea. This factory produced acetaldehyde and used Hg as a catalyst and waste sludge was drained into Minamata Bay (Chang, 1996). Methyl mercury was later discharged also outside the bay. That is how the contamination was diffused into greater region as well. Methyl Hg accumulated in the tissues of shellfish and fish that were subsequently consumed by wildlife and

people. Since 1950 the population in the bay was long exposed to methyl mercury. 2256 patients were registered in Minamata region in November 1993. All inhabitants in this region were exposed by around the threshold of Hg poisoning. However, fishermen and their families were exposed a lot more because of their consumption of fish that is normally higher than in other groups of inhabitants. For example out of 487 patients in Kagoshima there were 316 fishermen versus 40 farmers. It is known, that most of ingested Hg is absorbed in gastro-intestinal system and it is degraded to anorganic Hg inside the body. In case of high oral ingestion of methyl mercury during two months the percentages of anorganic Hg in total bound mercury in human tissues are following: 7 % in total blood circulation, 22 % in blood plasma, 39 % in breast milk, 73 % in urine and from 16 % to 40 % in liver (WHO, 1991). Very high volume (more than 80%) of Hg in the brains of patients with chronic Minamata disease is inorganic mercury (Kaim and Schwederski, 1994).

Ten years after Minamata case a similar phenomenon in Niigata, also Japan appeared. Wastewaters were discharged into river in Niigata, not into the sea like in Minamata Bay. Because river fish are consumed here by lesser people, methylmercury poisoning occurred much less (all in all 690 patients in Niigata to 2256 patients in Minamata Bay).

Overall it is possible to say, that human



exposition to Hg is virtually restricted to consumption of sea foods. So fishermen and individuals who tend especially to sea products are the most sensitive group of population from the view of Hg exposition.

The contamination of soils with cadmium from the anthropogenic sources is world known. No other case of poisoning by any other metal has aroused the scientific and clinic community as the itai-itai disease did (itai in Japanese mean „it hurts“). This disease was endemic in older women in Jinzu River basin, Toyama Prefecture in Japan since the WW II. The pain was caused by strange bone changes, large doses of vitamin D seemed to mitigate the pain. The disease occurred mostly in middle-aged or older women working on rice farms that gave birth to more children and were living in the region more than 30 years. Systematic research led by Ministry of Toyama Prefecture started in 1962. In consequence, Japan Ministry of Health and Welfare as well as Japan Association for Public Health accomplished environmental and epidemiological research focusing on the connection between Cd contamination and itai-itai disease. Results of this research were published in 1968 and they indicated following: renal tubular dysfunction was caused by Cd poisoning on the first place, than it was followed by the development of osteomalacia resulting in itai-itai disease (Asami, 1997 in Adriano, 2001). The incidence and severity of the disease

increased during pregnancy, lactation, aging, Ca deficiency, and other mineral imbalances in the body of female patients. About 95 % of rice fields (approximately 3.106 hectares) in Japan are contaminated with Cd, coming primarily as wastewaters from nonferrous metal mines. Approximately 6000 hectares of rice fields in 54 regions in Japan have been designated as areas of „polluted agricultural land“ because they are highly contaminated by Cd. Most affected regions are in Toyama Prefecture and Akita Prefecture, those represent about 53% of highest exposed areas. Moreover, in addition to rice fields, about 2,5. 106 hectares of uplands, including fruit groves are contaminated by Cd. The relationship between Cd content in rice and that in soil is affected by many factors. The maximum allowable limit of Cd concentration in soil is based on the content of Cd in rice grown on the rice field: 1,0 mg.kg⁻¹ of dry weight (Adriano, 2001).

Health effects of Cd poisoning were observed primarily in five regions of Japan (Table 2). The average content of Cd in rice field soils ranged from 1,12 to 6,38 mg.kg⁻¹ DW. The maximum Cd content ever found in the rice field soils of Japan was 930 mg.kg⁻¹, with range of 71 to 3304 mg.kg⁻¹. The maximum of Cd content in this case originated from wastewater from a factory that disassembles Ni-Cd batteries (Asami, 1997 in Adriano, 2001).



Location	Soils (mg.kg ⁻¹ DW) ^a			Unpolished rice (mg.kg ⁻¹ DW)		
	n	Mean	Range	n	Mean	Range
The Jinzu River basin	544	1,12	0,46-4,85	544	0,99	0,25-4,23
The vicinity of Ikuno Mine	19	6,38	3,90-12,16	19	1,06	0,79-1,44
The Sasu and Shiine River basins	69	5,6	1,0-12,0	400	0,90	0,20-3,64
The Kakehashi River basin	122	3,11	1,01-17,70	122	0,81	0,41-2,84
Kosaka area	-	4,01	1,43-11,33	-	0,78	0,16-4,81

Table. 2 Cadmium concentrations of surface rice field soils and unpolished rice in the most severely affected areas in Japan. Source: Asami, 1997 in Adriano, 2001. Explanations: n – number of samples; DW – dry weight; ^a 0,1 M HCl extraction was used; - not data

The source of pollution of rice field soils in the Jinzu River basin is the Kamioka Mine that is located about 40 km upstream of the Jinzu River. A survey focusing on concentrations of Cd, Zn and Cu in the rice field soils and the unpolished rice in this area (3128 ha) was conducted from 1971 to 1976. Concentrations of these potentially toxic elements were following:

Rice field surface soils (extraction by 0,1 M HCl, number of samples 1667):

Cd: average content 1,35 mg.kg⁻¹ (range 0,18

– 6,88 mg.kg⁻¹) DW

Zn: average content 59 mg.kg⁻¹ (range 8,1 – 865 mg.kg⁻¹) DW

Cu: average content 6,3 mg.kg⁻¹ (range 0,1 – 44,1 mg.kg⁻¹) DW

Following concentrations of potentially toxic elements were found in unpolished rice (number of samples 2570):

Cd: average content 0,37 mg.kg⁻¹ (range 0,0 – 5,20 mg.kg⁻¹) DW

Zn: average content 25,2 mg.kg⁻¹ (range 9,8 – 78,3 mg.kg⁻¹) DW

Cu: average content 6,3 mg.kg⁻¹ (range 0,9 – 19,5 mg.kg⁻¹) DW

When the contents of the metals extracted by 0,1 M HCl were compared with total amounts, 67% of Cu, 17% of Zn and 29,3% of Cu were extractable by 0,1 M HCl. Vertical distribution of analysed elements in the rice field soils shows that metals have moved to lower layers, as the history of contamination is very long (Adriano, 2001).

Remediation of rice field in the Jinzu River basin was accomplished by covering the surface soil with a 25-cm deep layer of noncontaminated soil. It is interesting that after remediation, the concentration of Cd in unpolished rice became lower than 0,1 mg.kg⁻¹.

Many authors presented the prevalence of itai-itai disease and renal dysfunction in the Jinzu River basin and in relation to cadmium concentration of produced rice (e.g. in last time



Nogawa and Kido, 1996 in Chang, 1996; Nogawa et al., 1983 in Adriano, 2001). Those authors collected home grown unpolished rice from 32 villages in the polluted area. As Figure 2 shows, there were no female patients with itai-itai disease in the control area. Extension of itai-itai disease and renal dysfunction increased with the increase of Cd content in rice.

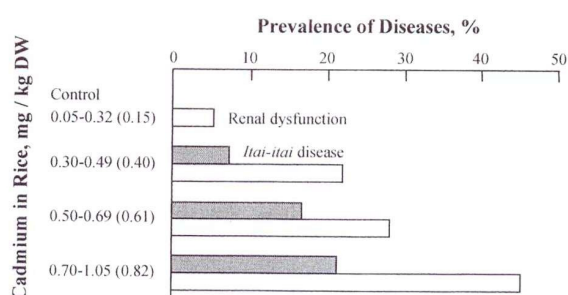


Figure 2 Prevalence of itai-itai disease and renal dysfunction among females over 50 in relation to average Cd concentration (mg.kg-1 DW) in rice in affected villages in the Jinzu River basin. Source: Nogawa et al., (1983 in Adriano, 2001)

164 patients were classified as disabled from the disease in 1993. In Jinzu River basin and in the Toyama Prefecture there are 388 patients under permanent medical care and observation (McLaughlin and Singh, 1998).

For the purpose to define a maximum allowable intake of Cd Nogawa et al. (1989 in Adriano, 2001) made an epidemiological study of 1850 Cd-exposed and 294 non-exposed inhabitants in the Kakehashi River basin, the study was based on the dose-response relation.

Authors calculated that an average daily dose of about 440 $\mu\text{g} \cdot \text{day}^{-1}$ in men and 350 $\mu\text{g} \cdot \text{day}^{-1}$ in women is expected to cause a 50 % response rate. The total lifetime Cd intake that can produce negative effect on health was calculated to be about 2000 mg for both men and women. If this amount is consumed over 50 years, it corresponds to an intake about 110 $\mu\text{g} \cdot \text{day}^{-1}$ (Nogawa and Kido, 1996 in Adriano, 2001).

Conclusion

In this contribution the most known world endemic poisonings with the potentially toxic trace elements As, Hg and Cd were pointed out in three case studies based on literature sources. In all cases the is water (drinking water or wastewater) the most important transport medium. In the case of the greatest endemic poisoning in modern history the ingestion of drinking water is the most important exposition path of As. Described cases of poisoning in Japan have common features – wastewater from industrial factories discharged in Minamata into the sea and in the case of Cd poisoning discharge of wastewater into Jinzu River in the Toyama Prefecture. Hence water has an important (if not the most important) function from the environmental geochemistry point of view in transport of chemical elements and compounds. Water is also consecutive factor of its entrance to organisms whether via food chain or through other form. A research on medical geochemistry



topics on an appropriate level started in Slovakia at the turn of the millennium on Faculty of Science of Comenius University Bratislava, and namely at Dionyz Stur State Geological Institute (see e.g. Rapant et al., 2002).

Doc. RNDr. Miloslav Khun, CSc.

Department of Geochemistry, Faculty of Science,
Comenius University Bratislava

e-mail: khun@fns.uniba.sk

Bibliography

1. Adriano, D., C., 2001: Trace Elements in Terrestrial Environments. and Risk of Biogeochemistry, Bioavailability Metals. Berlin, Springer Verlag, , 867

2. Chang, L. (Ed.), 1996: Toxicology of Metals. CRC Press, Boca Raton, FL, 527

3. Kaim, W., Schwederski, B, 1994: Bioorganic Chemistry: Inorganic Elements in The Chemistry of Life. An Introduction And Guide. New York, John Wiley and Sons, 397

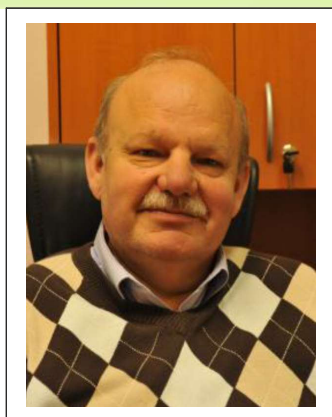
4. Kinniburgh, D. G. and Smedley, P. L. (eds.) 2000. Arsenic Contamination of Groundwater in Bangladesh. Final Report. British Geological Survey Technical Report c/oo/19, Three Volumes.

5. McLaughlin, M. J. a Singh, B. R. (Eds.), 1998: Cadmium in Soil, Plants and the Food Chain, Dordrecht Kluwer Academic, 348

6. Netopil, R., 1972: Hydrologie pevnin. Praha, Academia, 294

7. Rapant, S., Cicmanová, S., Khun, M., Lučivjanská, V., Mackových, D., Pramuka, S., 2002: Medical geochemistry research in Slovak Republik. Geol. Carpath., 53, (Special Issue)

8. Thornton, I., 1996: Sources and pathways of arsenic in the geochemical environment: health implications. In: Appleton, J. D., Fuge, R. a McCall, G. J. H., 1996: Environmental Geochemistry and Health. Geol. Soc., London, Spec. Publ. 113, 153-161



Ichthyotherapy - biotherapeutic treatment method for patients with skin diseases using Garra rufa fish

RNDr. Peter Takáč, CSc.

Abstract

The name ichthyotherapy comes from the Greek name for fish - Ichthys. In this

biotherapeutic method Garra rufa fish are used for skin cleansing or treatment of other skin disorders. The history of this therapeutic method in traditional medicine is poorly documented. The museum near the river Kwai has a record of human suffering in prison camps and a sketch showing a prisoner immersed up to the waist in water with fish that are cleaning ulcers of the tibia. It is the first historical record of ichthyotherapy. Furthermore, there are records of widespread use of these fish in India, especially in rural areas. The best known form of ichthyotherapy is in the treatment of skin diseases with the use of Garra rufa fish, commonly known as "doctor fish" or nibbling fish, for cleaning damaged areas of the skin. This fish is found naturally in the Euphrates river. The benefits of using it were first observed in Kangal, Turkey – therefore it is also called the Kangal Fish. This article describes a comprehensive look at the ichthyotherapeutic method. We describe a procedure of ichthyotherapeutic treatment and the results of that treatment. The ichthyotherapeutic treatment was performed in the biotherapeutic facility of Scientica, Ltd. At St. Michael's Hospital in Bratislava.

Keywords: ichthyotherapy Garra rufa, Kangal fish, psoriasis, biotherapy

Introduction

„Biotherapeutic medicine is an inseparable and valuable part of current modern medicine in the treatment and prevention of serious diseases and illnesses“.

Biotherapy represents a set of therapeutic methods that use various animal species in the diagnosis or treatment of a range of diseases. The key point is that they are living organisms. Biotherapy includes the following methods: medicinal leeches (therapy using leeches), larval therapy (larvotherapy - therapy using insect larvae, maggot therapy), apitherapy (bee products and the use of bee venom), ichthyotherapy (use of fish in the treatment of skin diseases), service animals (seeing-eye dogs), olfactory detection (dogs detecting cancer in humans), helminthic therapy (use of nematodes to treat intestinal inflammation and immune disorders), bacteriophages (viruses that kill bacteria) and many more.

The practice and history of biotherapy is very diverse. Some biotherapeutic methods such as medicinal leech therapy or bee venom have been used for thousands of years. Other methods were introduced relatively recently. The first clinical studies of helminthic therapy were published less than 20 years ago. Some biotherapeutic

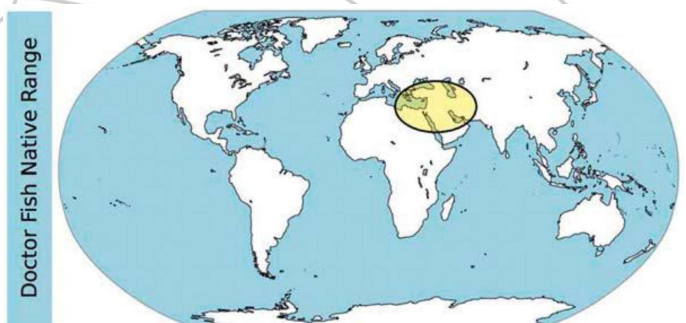


procedures are now fully accepted by the medical community, which does not dispute their use and role. Good examples include larval therapy for wound care and the use of leeches in the treatment of vascular decompression, plastic surgery, etc. These methods have prompted legislation to be adopted in many developed countries as well as fostered institutional adoption and, naturally, media attention. Biotherapies all have one important common feature, namely, that we should be aware of how to mingle with other animal species and how well we live together, work together and, sometimes, even live together symbiotically. Biotherapy forces us to realize that even the lowliest animal can contribute many positive things to our world.

In 1993 the Istanbul International Medical Congress was held, where, among other things, they talked about the error in ignoring the importance of natural healing resources. Specifically, this concerned the treatment of skin diseases with minor carps and Cyprinion macrostomus and *Garra rufa* obtuse gold fish. The results of treatment with this animal "doctor" were so significant that the medical community had to accept the fact that nature, even in this case, had a cure where science was helpless. Since that day ichthyotherapy has garnered acceptance as a new biotherapeutic method. Ichthyotherapy is a method that uses certain species of fish for the treatment of various skin diseases. Today there are several centers around the world that perform ichthyotherapy based on scientific research. To date, only a few have carried out serious clinical studies on the effects of ichthyotherapy for various skin diseases.

History of Ichthyotherapy

The name ichthyotherapy comes from the Greek name for fish - Ichthys. The history of this therapeutic method in traditional medicine is poorly documented. The museum near the river Kwai has a record of human suffering in prison camps and a sketch showing a prisoner immersed up to the waist in water with fishes that are cleaning ulcers of the tibia. It is the first historical record of ichthyotherapy. Furthermore, there are records of widespread use of these fish in India, especially in rural areas. The best known form of ichthyotherapy is in the treatment of skin diseases with the use of *Garra rufa* fish, commonly known as "doctor fish" or nibbling fish, for cleaning damaged areas of the skin. This fish is found naturally in the Euphrates river. The benefits of using it were first observed in Kangal, Turkey – therefore it is also called the Kangal Fish (Ozcelik et al., 2000).



In the Turkish province of Sivas Kangal at a local spa, indigenous operators noticed more than 200 years ago that brownish-greyish fish that were caught unintentionally in vats of hot water were concentrated around the hardened dead skin of visitors and were nibbling it. A similar situation did not occur at natural springs, or happened only very rarely, and this led to the suspicion that if the fish had plentiful access to



vegetable and animal protein, then human skin did not attract them. However, when they found themselves in closed vats with limited livelihood, they aggregated in places where dry human skin would peel. The Kangalies did not know what a unique creature emerged at that time. The beneficial interest in immersion in thermal water with fish grew and increased the number of vats. Today the Kangal baths have an international status, and are sought out by more and more patients with chronic warts, fungal infections, dry eczema and especially patients suffering from psoriasis. The unique thermal water has a temperature of 37 ° C and contains 1 gram of selenium per liter of water. In itself it is remarkable that the therapeutic fish are capable of living in water at such high temperatures. Because of the high altitude, the unusual Kangal environment offers other physical benefits to patients, including the natural effect of ultraviolet rays on the damaged skin. The treatment was first mentioned in Lancet magazine in 1989, but its details have only recently been described in detail in the work of Ozcelik (Özcelik et al., 2000). In the entire world there is no other comparable therapeutic method that offers all the benefits of the Kangal spa. Kangal thermal waters are home to two kinds of toothless fish that live in 37 ° C water: Cyprinion macrostomus and Garra rufa. Both species belong to the carp family (Cyprinidae). Garra rufa is the species that is most commonly used for therapeutic purposes. Garra rufa inhabits the bottom of streams, where with its sickle mouth suction cups attach to rocks and it feeds on phyto- and zooplankton. Because in the hot springs of Kangal phyto and zoo

plankton are rare, these fish feed on skin scales of patients with skin diseases such as psoriasis and atopic dermatitis. These fish usually grow to a length of 10 cm.

Materials and Methods

Garra rufa ichthyotherapeutic fish



(Özcelik et al. 2000; Grassberger and Hoch 2006). In recent years *G. rufa* have been imported to North America and Europe for use in ichthyotherapy. *Garra rufa* is a benthopelagic, sedentary freshwater fish originating from the Middle East. Most often it is described as a "doctor fish" because it can feed on dead skin. This is also the reason for its use in spas, pedicures and especially in the treatment of psoriasis (eg, Özcelik et.al.)

Name and classification

according to Froese and Pauly (2010) and ITIS (2010)

Kingdom: Animalia

Phylum: Chordata

Class: Actinopterygii

Order: Cypriniformes

Family: Cyprinidae

Genus and species: *Garra rufa* (Heckel, 1843)

Trade name: Doctor Fish



Most used Synonyms: Discognathus crenulatus Heckel, 1846 -1849; Discognathus obtusus Heckel, 1843; Discognathus rufus Heckel, 1843, Garra rufa crenulata Heckel, 1844, Garra rufa Gymnothorax Berg, 1949; Garra rufus Heckel, 1843

Ichthyotherapeutic tubs

The Garra rufa fish are placed in plastic fiberglass therapeutic tubs in the shape of a classic elongated bathroom tub. The volume of each tub is about 1000 liters; the water level is 20 cm below the rim of the tub. Each tub has about 300 fishes of 5 cm in size. The baths can be separated with curtains if patients want to have privacy. Room air conditioning has been installed to remove humidity if it is too high, and to maintain a comfortable temperature. The room is heated on colder days to 28 ° C. The tank requires insulation so that the water in the tank does not cool down too quickly. Polystyrene and polyurethane foam were used in our laboratory to insulate the bottom and side walls of each tank. The top of the tank must be transparent so that the fish have enough daylight. It must also be resistant to water that precipitates on it. Therefore, transparent polycarbonate sheets were used to cover the top of the tank.



Preparation of water for therapeutic baths

Water for the therapeutic baths is prepared in advance in two 300 l plastic garden barrels placed in the recovery room. Cold tap water is initially brought through a powerful filtering system filled with activated carbon, which effectively eliminates chemicals and gases. But it cannot cope with completely soluble substances, water hardness or heavy metals, so we allow the water to flow through reverse osmosis equipment. The flow through these modules is approximately 60 l / h. The water is demineralized and this process also gets rid of the bacteria. The water so prepared is then re-mineralized in barrels with a mixture of mineral salts for freshwater aquariums to the original value of the tap water. In our case, 750 liters of demineralized water and 500 grams of mineral salts are mixed until the salts are completely dissolved. The delivered water thereby has a hardness of 12 ° dH. The prepared water is then pumped (flow rate up to 3000 l / hr) directly into the therapeutic baths through a water pipe ending with a valve that is connected to a hose that fills the bath.

**Water exchange in the therapeutic tubs**

Bathwater is changed once a week and also after the end cycle of a medical procedure, which takes 2–3 weeks. The length of treatment depends on the patient. Each patient is assigned their own fish. At the end of each week, most of the water is drained from the tub through a protected drain and filled with new, clean water, ready in barrels in the recovery room. After finishing the two-to-three-week treatments the fish are caught and transferred to two aquariums in the recovery room, where they spend two to three weeks in quarantine during which they regenerate. The water is drained from the bath, the bath is thoroughly washed from the inside, disinfected and filled with new, previously prepared clean water. The bath is fitted with new regenerated fish and a new patient starts the therapeutic treatment. The temperature of the water in the pots is maintained at 34 ° C, being heated and filtered through powerful filters; it also passes through UV lamps with ultrasound.

Filtration system

Each therapeutic bath has two large external filters (with a flow rate up to 1700 liters / hour) installed, which also incorporate powerful 500 W thermoregulated water heaters, with the water temperature adjustable up to 34 ° C. The filters are connected in series. The water is sucked into the first filter in the lower part of the therapeutic bath, where the top of the filter is a specially shaped container with a foam filter layer that captures most coarse mechanical impurities. By passing through another layer of fine filter

material the water is purified from fine particles of dirt. The water passes further on through two layers of siporax (small hollow cylinders of pressed glass waste) that, by virtue of their large surface areas sown with nitrifying bacteria, also purify the water biologically. Water from the first filter is passed onto the second filter, which again passes through a specially shaped container with a foam filter pad and again through three layers of siporax for biological water purification.

UV-C sterilizers

Before the water from the filters enters the therapeutic baths, it passes a built in UV-C sterilizer generating ultraviolet radiation with a power of 36 W, combined with ultrasound waves. These filters together disinfect the water, killing bacteria, viruses and other simple organisms and preventing them from multiplying. The water is then returned to the therapeutic baths clean and clear.

Treatment

It has been proven that Ichthyotherapy by *Garra rufa* fish is effective with patients suffering from various skin disorders:

Indications for Ichthyotherapy
Psoriatic arthropathy
Lichen planus
Hyperkeratosis
Ichthyosis
Infantile eczema
Atopic dermatitis
Rosacea
Chronic eczema
Fungal diseases
Acne



Contraindications to Ichthyotherapy
Psoriatic erythroderma
Thrombophlebitis
Lupus erythematosus
patients with open wounds
patients with bleeding wounds
patients with infectious hepatitis B and C
patients with HIV
Patients with high blood pressure
patients with circulatory problems

The Garra rufa fish live in an environment that does not give them sufficient nutrients, so they will accept a food source such as dead human skin. It should be emphasized, however, that this type of treatment results in only temporary relief and is not a cure for skin diseases. The best results achieved so far with ichthyotherapy have been in patients with psoriasis, so fish spas proliferated in many countries in Europe, Asia, Japan and Singapore. In 2002 and 2004, a pilot study was conducted to determine the efficacy of Garra rufa fish for outpatient psoriasis treatment in Austria. The principal investigator prof. M. Grassberger retrospectively analyzed 67 patients with a psoriatic diagnosis who underwent 3 weeks of ichthyotherapeutic treatment. Under the controlled supervision of dermatologists, the effectiveness and safety of ichthyotherapy in combination with short-term ultraviolet radiation (311 nm) for psoriasis treatment was assessed.

PASI score

PASI score is a tool used in measuring the severity and extent of psoriasis. Mastering accurate measurement takes only a few minutes.

Intensity

A representative psoriatic area is selected for each area of the body. The intensity of redness, thickness and extent of the psoriasis are rated as none (0), mild (1), medium (2), severe (3), or very severe.

Ichthyotherapy treatment procedure

Procedure for treatment:

1. The patient visits a dermatologist specialist who thoroughly examines the patient, determines a diagnosis and, if the diagnosis is appropriate, orders ichthyotherapeutic treatment.
2. The patient starts the ichthyotherapeutic treatment. Prior to any therapy the patient takes a shower and thoroughly removes any residual deodorant, cream etc. from the skin.
3. The therapy takes place in the water tank at a temperature of 33–34 ° C which corresponds to the naturally occurring thermal conditions of the original fish. Patients are partially or completely immersed in the water and submit themselves to the fish. The fish seek out every bump on the skin of the patient and nibble the skin for tiny flakes. The fish do not have teeth, just rougher skin around the snout, so they do not open bloody wounds, which many patients fear prior to treatment. It turns out, however, that living tissue stops the fish. It is no small matter that the gentle rubbing of their bodies against the skin also



Intensity	None	Mild	Medium	Severe	Very severe
Redness					
	Score 0	Score 1	Score 2	Score 3	Score 4
Thickness					
	Score 0	Score 1	Score 2	Score 3	Score 4
Scurffiness					
	Score 0	Score 1	Score 2	Score 3	Score 4

induces a micromassage experience. After the first treatment, which, according to the nature, extent and depth of the skin condition takes 1–2 hours, cannot talk about the radical outcome. The patient initially feels itching and increased sensitivity at the treatment site because their skin is not used to this, having been long suffocated by overgrown dead skin. The fish treatment is divided into several stages that need to be repeated at regular intervals; visible signs of healing often come only after two or three weeks. The affected areas remain bloodshot with red spots. They gradually shrink and fade as a new solid layer of skin is created, which finally blends

completely into the surroundings. It is necessary to mention that these fish are a living organism that is sensitive to toxins and other poisons in water and food. It is therefore important to avoid the use of antibiotics or the application of any pharmaceutical creams and also abstain from drinking alcohol prior to any treatment.

4. After the ichthyotherapeutic procedure, the patient takes a shower again.

5. After each ichthyotherapeutic procedure the patient undergoes phototherapy. Phototherapy in the form of sunlight has long been used effectively to treat psoriasis. Wavelengths of 311–313 nm have been proven to be most effective, and



special irradiation devices have been developed for this application. The dermatologist prescribes the exposure time, which is controlled to prevent burning of the skin and overexposure. The UVB irradiation device has a timer that turns off the lamp as soon as the time for UV therapy ends.

Results

The main outcomes of the study were the following:

- of the 67 patients studied, 91% reported considerable satisfaction with the treatment
- a total of 87.5% of patients reported favorable results after ichthyotherapy
- 65% reported that after treatment their symptoms of hypoglycaemia were less severe than before treatment
- proportion of patients with PASI were improved from 50% to 75%
- Patients reported an average relief period of 8.58 months
- When patients were asked to compare ichthyotherapy with previously tested therapies, a total of 67.5% said the most favorable outcome was with ichthyotherapy
- 65% of patients confirmed that upon further worsening of their symptoms, they were still less severe than before the treatment procedures
- There were no serious adverse cases
- Results of the study suggest that ichthyotherapy improves the condition of patients with psoriasis.

A pilot study was published in the scientific journal Oxford-Journal in December 2006.

Case report description

Diagnosis: Psoriasis Vulgaris generalisata, plaque form. J. F. 73 year old patient with a 20-year history of plaque psoriasis with gradual progression to 60 % of the body surface. In the course of the disease he underwent outpatient as well as repeated hospitalization therapy with only short-term effects. He alternately and simultaneously applied emollients, corticosteroids, vitamin D3 analogues, and the external part of coal tar locally. In 2005 and 2006 he underwent balneophototherapy - TOMESA. In recent 5 years, the generalization of expressions and also total acitretin therapy (2 years, ended due to poor tolerability and loss of therapeutic effect), cyclosporine (14 months, ended due to significant elevation of serum creatinine). Given the progression of psoriasis symptoms despite topically applied therapy the treatment was stopped and the patient sent to supportive Ichthyotherapy treatment (90 min.) followed by phototherapy with 311 nm UVB at an initial dose of 0.3 J / cm, with an increase of 0.1 J at each subsequent applications up to a maximum single dose of 1.1 J / cm. After each treatment the skin was treated locally with emollient cream containing urea at a concentration of 4 %. The patient had a PASI of 21.6 at the beginning and tolerated the treatment very well. After 15 applications within 3 weeks he achieved a PASI of 9.6. As the psoriatic plaques showed no scale formation ichthyotherapy was terminated and the



patient continued with phototherapy only, receiving 311 nm UVB at a dose of 1.1 J / cm twice per week until the psoriasis symptoms were completely healed.



Discussion

No scientific study has yet described the precise mechanism of ichthyotherapy. A series of mechanisms have been proposing based on phenomena observed during treatment with ichthyotherapy. One obvious mechanism is physical contact with fish that feed on dead skin scales, leading to a rapid reduction in surface skin scales. Moreover, many patients consistently report a pleasant micro-massage sensation during the procedure, when the fish nibble on the skin (Grassberger and Hoch 2006). Interestingly, the fish prefer hyperkeratotic skin to healthy skin, perhaps because they have an easier time

removing the scales.

Another proposed mechanism is a direct effect of the increased UV radiation associated with ichthyotherapy, whether it is natural light or artificial radiation at 311 nm. Phototherapy is a recognized alternative for psoriasis patients with extensive lesions (Paul et al. 2012), and skinning by fish appears to facilitate greater penetration of UV rays into the skin.

Further, the presence of high concentrations of selenium (1.3 mg / l) in the Kangal hot springs has also been suggested as a contributing factor (Ozcelik et al., 2000), although Grassberger and Hoch (2006) reported similar efficacy with relatively low levels of selenium in the waters. Therefore, the concentration of selenium in the water is probably not a major factor in the observed efficacy of ichthyotherapeutical treatment. Psychological factors such as stress are considered to be causal or aggravating factors in psoriasis (Arck and Paus 2006). Because most patients consider fish spas relaxing and enjoyable, ichthyotherapy could beneficially contribute to the treatment simply by reducing stress. It is also possible that the abundant oral secretions of the fish have direct anti-inflammatory effects or peeling effects. Several studies have shown that the surface mucus of fish plays an important role in host defense, particularly in preventing colonization by pathogens. Several studies have also shown that the surface ooze of fish comprises a plurality of crinotoxines, calmodulin, pheromones and various antimicrobial agents such as fatty acids, immunoglobulins, complement components,



lectins, lysozymes, proteolytic enzymes and antinociceptive agents (Subramanian et al 2008, Jais et al. 1998). Polysaccharides isolated from the mucus of *Misgurnus anquillicaudatus*, a freshwater fish (Cobitidae), showed strong anti-proliferative and apoptosis-inducing properties (Zhang and Huang 2005). This finding is remarkable, given that the problem in psoriasis and ichthyosis is a very high number of mitotic epidermal cells. However, no research has yet been performed with *G.rufa* to determine whether there is a similar effect in this species.

While many operators of ichthyotherapy describe on their websites that *G.rufa* secretes a unique enzyme called dithranol (anthralin analog that prevents proliferation of the epithelium), this argument has not yet been scientifically demonstrated by anyone. In fact, it seems highly improbable that fish are capable of producing a substance that was found in the bark of the Araroba tree from South America that has also been produced synthetically for decades.

Acknowledgements

This study was established with the support of the Operational Program Research and Development and co-financed by the European Fund for Regional Development (EFRD). Grant: Establishment of biotherapeutic facility and technology proposal for production and development of bio-drugs. (ITMS: 26240220020).

RNDr. Peter Takáč, Csc.
Scientica, s.r.o.

Hybešova 33

831 06 Bratislava

www.scientica.sk

e-mail: peter@scientica.sk

Bibliografia

1. Froese, R. and Pauly, D. Editors. 2010. FishBase. version (01/2010) [Online database] <http://www.fishbase.org/search.php>
2. Grassberger, M., and Hoch, W. 2006. Ichthyotherapy as alternative treatment for patients with psoriasis: A pilot study. *Evid.-Based Compl. Alt. 3*: 483-488.
3. Integrated Taxonomic Information System (ITIS). 2010. Web database application. <http://www.itis.gov>
4. Ozcelik, S., Polat, H.H., Akyol, M., Yalcin, A.N., Ozcelik, D., and Marufihah, M. 2000. Kangal hot spring with fish and psoriasis treatment. *J. Dermatol. 27*: 386-390.
5. Paul, C., Gallini, E. Archier, E. Castela, S. Devaux, S. Aractingi, F. Aubin, H. Bachelez, B. Cribier, P. Joly, D. Jullien, M. Le Mar tre, L. Misery, M.-A. Richard, J.-P. Ortonne. 2012. Evidence-based recommendations on topical treatment and phototherapy of psoriasis: systematic review and expert opinion of a panel of dermatologists, *JEADV, 26* (Suppl. 3), 1–10.



6. Arck, P., Paus R. 2006. From the brain-skin connection: the neuroendocrine-immune misalliance of stress and itch. *Neuroimmunomodulation*. 13(5-6):347-56.

7. Subramanian, S., Ross, NW., MacKinnon SL. 2008. Comparison of antimicrobial activity in the epidermal mucus extracts of fish. *Comp Biochem Physiol B Biochem Mol Biol*. 2008 May; 150(1):85-92. doi: 10.1016/j.cbpb.2008.01.011. Epub 2008 Feb 9.

8. Jais, AM., Matori, MF., Kittakoop, P. 1998. Fatty acid compositions in mucus and roe of Haruan, *Channa striatus*, for wound healing. *Sowanborirux KGen Pharmacol*. 30(4):561-3.

9. Zhang, CX., Huang, KX. 2005. Apoptosis induction on HL-60 cells of a novel polysaccharide from the mucus of the loach, *Misgurnus anguillicaudatus*. *J Ethnopharmacol*. 14;99(3):385-90.



FYZIOTERAPEUTICKÝ SYSTÉM TRANSKUTÁNEJ ELEKTRICKEJ NERVOVEJ STIMULÁCIE (TENS)

Princíp liečby prístrojom TENS Dm18107 spočíva v stimulácii nervu a svalu striedavým elektrickým prúdom rôznej frekvencie a priebehu. Systém je vhodný na podpornú fyzikálnu terapiu rôznych neurologických, ortopedických, interných a iných ochorení sprevádzaných bolesťou a zvýšeným alebo zníženým svalovým napätím. Analgetický účinok liečby je vysvetliteľný ovplyvnením vedenia vnímania algického podnetu (vrátková teória bolesti podľa Meltzaka a Walla), myorelaxačný účinok spočíva v podobnom princípe ako postizometrická relaxácia a tonizujúci vplyv je založený na priamej elektrickej stimulácii periférneho nervu.



Aké sú výhody?

- tlmiť bolesť tam, kde iná forma tlmenia bolesti je kontraindikovaná
- možnosť aplikácie „kdekoľvek a kedykoľvek“
- odborná asistencia nie je potrebná

prim. Prof. MUDr. M. Kováč, CSc.
neurologické odd. NsP, Nové Zámky

SOLNÁ FAJKA – jednoduchý suchý inhalátor

Denným 15-20 minútovým používaním Solnej fajky môžeme priaznivo ovplyvniť:

- alergiu dýchacích ciest
- astmu
- nádchu
- zápal dutín tváre a nosa
- podráždenie dýchacích ciest zapríčinené fajčením



Choroby dýchacích ciest sú v súčasnosti na poprednom mieste výskytu v detskej i dospeljej populácii. Ide o značný nárast alergických ochorení – alergická nádcha, bronchiálna astma, chronická obštrukčná choroba pľúc a iné. Sprievodným znakom týchto ochorení v dôsledku zápalu je zvýšená tvorba hlienov, sťažené dýchanie, častejšie záchvaty kašľa, dýchavice. Na uľahčenie expektorácie hlienov okrem medikamentózneho liečby pomáha aj Solná fajka (pre deti Solný sloník). Najčastejšou indikáciou tejto zdravotnej pomôcky, ktorú som indikovala, boli pacienti s častými sínusitídami, exacerbovanými bronchitídami, bronchiálnou astmou, syndrómami dráždivého kašľa, inhaláciou škodlivých látok, tiež pacienti s fajčiarskou bronchitídou.



MUDr. L. Frajtová
Ambulancia TaPCH, Prešov

Výrobky na slovenský trh dodáva:

VitaFit spol. s r.o.

Kontakt:

00421 905 448 715 alebo 00421 2 6241 3212
www.vitafit.sk, www.epredaj.com

LIEČIVÁ MEĎ

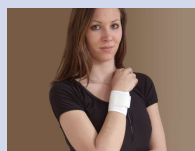
Meď je veľmi dôležitý stopový prvok. Potrebujú ju k svojej aktivite mnohé enzýmy, napríklad: lyzoxidáza, tyrozináza, cytochrómoxidáza, dopamín –b- hydroxyláza, superoxid – dismutáza, aminooxidáza. Do organizmu sa meď dostáva stravou, môže sa však vstrebávať aj cez pokožku. Textilie s obsahom medi pomáhajú znižovať deficit medi v organizme – sú prostriedkom doplnkovej liečby niektorých ochorení.

Ďalšie účinky medi:

- . významnú úlohu zohráva pri zdravej tvorbe kostí, chrupavky, pokožky a kolagénu
- . ničí baktérie, vírusy a zárodky hubových infekcií
- . podporuje krvný obeh
- . zabraňuje vzniku kandidózy
- . urýchľuje regeneráciu organizmu po úrazoch, operáciách a zlomeninách.

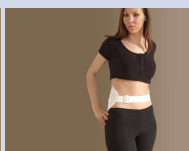
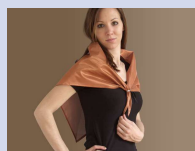
MUDr. J. Lóránth, Maďarsko

Čelenka s obsahom medi – zmierňuje bolesti hlavy, odporúča sa používať ju aj proti migréne. Pri bolestiach hlavy ju možno priložiť okolo krku – uvoľňuje kŕčovitosť svalov krku a podporuje normalizáciu krvného obehu v mozgu. Rovnako pomáha aj pri regenerácii „zlezaných“ alebo prechladnutých svalov krku.



Pás na zápästie s obsahom medi – odporúča sa nosiť ho pri bolestiach zápästia (presilenie napr. pri práci s počítačom), ďalej pri chorobách, ktoré vznikajú z nedostatku medi v organizme (málokrvnosť, osteoporóza, reumatické bolesti, Menkesov syndróm).

Šatka s obsahom medi – odporúča sa pri bolestiach krčnej chrbtice, obmedzenej hybnosti krku a pliec.



Posteľná plachta s obsahom medi – podporuje zdravý, uvoľnený spánok. Textilná s obsahom medi odráža vysokofrekvenčnú radiáciu.

Kontraindikácie: Výrobky sa nesmú používať pri alergii na meď, pri Wilsonovej chorobe a pri zápale kĺbov!

PONOŽKY SO STRIEBROM

Tkanina s obsahom striebra je výborným vodičom tepla a elektriny, čím bráni statickému nabití. Striebro obsiahnuté v ponožkách vo forme postriebreného vlákna ničí baktérie a huby, ktoré vyvolávajú nepríjemný pach spotených nôh. Udržiava nohy v teple, vytvára ideálne prostredie pre kĺby a celkovo zvyšuje fyzický a psychický stav.

Ničivý účinok striebra na huby a baktérie bráni aj ich usídleniu vo vložke topánok.





The change of my acupuncture thinking

prim. Jarmila Opáthová, M.D.

My study of acupuncture happened by chance. I knew about acupuncture that it is a

method of treatment used especially in the East, in China, Korea, Japan. It is used in human, in animals and plants. Pictures of acupuncture meridians and needles stuck in the patients' bodies seemed to me interesting and mysterious. That was everything what I knew at the beginning.

My first contact with acupuncture was during the Basic course of acupuncture for medical doctors in the Centre of acupuncture in Bratislava led by spouses MUDr. Gustáv Solár, PhD. and PaedDr. Zlatica Solárová, PhD. The course was held in three-day cycles with a total length of 200 hours. An interesting group of doctors from several medical disciplines (general medicine, gynecology, psychiatry, otology, ophthalmology, acute medicine, dentistry) met there. At that time all course participants have had long-time practice in their medical disciplines, extensive experience in treating patients according to the ideas and the rules of „Western medicine.“

At the beginning of the study we were acquainted with the basic terms and definitions, for example acupuncture point, channel or meridian, Qi. We were dealing with generally

accepted postulates related to the existence of our entire planet from the Big Bang. When receiving such a wide range of information, I often wondered where all this led me. As the teaching sequence was step by step, we started learning about meridians. When learning about meridians, my several classmates and me repeatedly experienced feelings of hopelessness. At the beginning for example the Bladder meridian or Gall bladder meridian with their number of points and processes seemed to me like a nightmare. I really admired those who perfectly handled the primary and all divergent channels belonging to the system of meridians through which Qi flows. That not only in Slovak language.

I started to doubt the significance of my effort, because I knew that if it is necessary to „mug“, I will not be willing to invest so much energy for all this. Led by our strict, didactic but kind and highly professional trainers I started to learn the processes of short as well as longer meridians step by step. I was hoping at the bottom of my heart, that this might not be that acupuncture. I still could not imagine how and where to stick a needle, when to take it out and then, how it manifests on a patient and when he would be healed and healthy. At the beginning we defined acupuncture as the medical discipline, i.e. it is based on the theory, it has its research, methodology, diagnostics, application in prevention and treatment. However, I could not

An Insight into the Acupuncture Thinking

The change of my acupuncture thinking

prim. Jarmila Opáthová, M.D.



even imagine acupuncturist thinking. I was sometimes so chaotic, that I was seriously deciding for several times to leave the course. Well, our collective „spirit“ and my curiosity drove me for something that was still between heaven and earth for me. Sokrates said: „The unexamined life is not worth living.“

Thus, hours and hours of theoretical and practical training followed until it became clear. For example, it is not enough to know meridians, but it is important to have a patient's anamnestic data (the story), it is necessary to use the spectrum of diagnostics methods from aspection, palpation to TST (Tactile Solar's Test) and that the connections between pentagram, organs, colours, tastes, biorhythms and all other are clear and useful. The whole approach is simply holistic. There is really nothing new under the sun, only contexts are more evident. So the level of energy-informational fields, microsystems, their projection in the body awakened my imagination so much that I could really imagine a man as „woven from these microsystems“, that communicate with each other and apply the fractal principle within. At that moment I could literally imagine how the body changes its dynamic states in terms of maintaining homeostasis, maintaining the largest arrangement of health and not only on the biochemical level.

From that moment I started to trust acupuncture. The insertion of needle was not a problem anymore, it became rather a routine. Moreover, new and new phenomena that help our daily work were occurring in our training. And this is for example the doctor's approach itself. According to the quotation of Mother Theresa:

„God does not look on how much we do, but how much love we put in the doing“.

I realized that it is not only the empirical experience written many years ago that matter in this modern understanding of acupuncture. Acupuncture has become a modern medical discipline, following with the spirit of its time, thanks to a change in thinking of acupuncturists, contexts and logic.

All classmates in the group had one thing in common, we were looking for something that the Western medicine gives us rarely, namely the holistic view of a man and his diseases. I think back to a sentence of a theologist who said in a free debate during his performance, that we should take care of our bodies like they were homes so that our souls would want to dwell there. If I could not imagine anything about acupuncture at the beginning of my study, then later I thought that it was the Holy Grail. Finally I came to the knowledge, that acupuncture is one of useful ways of helping patients because health and a disease is a way (Tao). Not even Christ did bear his cross without the help of others, and therefore I am very glad, that my classmates and me could take part of all this.

prim. Jarmila Opáthová, M.D.

CSA 234/139

Kremnica

jarmila.opathova@gmail.com



Acupuncture and Natural Medicine Instructions for Authors

Acupuncture and Natural Medicine is an e-magazine of Medical Society of Natural Medicine (MSNM). It's main scope is the study of pathological changes in humans and the environmental and social influences on people from the standpoint of acupuncture. It publishes articles about acupuncture and other interdisciplinary fields involved.

The publisher enables the author to publish his or her unpublished works. Pursuant to provisions of Act no. 618/2003 Coll. (Copyright Act), the author waives his or her right to equitable compensation for such manuscript. The publisher does not return unsolicited contributions. The publisher sends an electronic contract to authors of studies.

E-magazine Acupuncture and Natural Medicine publishes 4 different types of contributions:

1. **studies** (3 standard pages and above- 1230 words) - original scientific work based on fundamental research
2. **surveys** (3 standard pages and above- 1230 words)- regarding current issues and problems in acupuncture and other interdisciplinary fields, informative articles and discussion
3. **reviews**- short informative reviews of up to 1 standard page
4. **reports** on scientific events – up to 10 lines, the title constitutes a part of the text

The form of studies and surveys:

- **Basic format:** MS Word, font Times New Roman, font size 12, double spaced, unaligned on the right edge, paragraph 5 strokes from the left, aligned to the left, no page numbering, refrain from word division;
- **The first page** contains the name of the study, the author's name and institution, abstract in Slovak language, respectively, in the language of the paper, max. 600 symbols (including spaces), Times New Roman font type with font size 11 points, 4-6 key words, phrases;
- **A summary** in English language below the study shall be present, approximately 10 lines (600 symbols including spaces) in lengths, including the author's name and address, or e-mail address;
- **Citations:** kindly include citations of less than 4 lines in double quotation marks inline, quotes exceeding 4 lines shall be divided into visually separate short paragraph absent of quotation marks, 5 strokes from the left, using Times New Roman font type size 11 points;
- For citation within citation, single quotes shall be used;
- Short bibliographic reference styled as (Bakoš 1966, 115) following a citation shall be used;
- citations originally in foreign language authentic and translated (inline or in the end note);

- Insert notes using MS Word feature (endnotes) to the very end of the text. Comments should be minimalistic and include information that cannot be written directly to the text;.
- **Bibliography** is mandatory, for formatting please kindly see examples.

Bibliography: (examples)

Monographies:

Bakoš, M.: *Vývin slovenského verša od školy štúrovej*, 3. vyd. Bratislava: VSAV, 1966.

If the citation is not from the original edition, a year of original edition should be stated:

Kundera, M.: *Žert*. (1969). Praha: Orbis, 2005.

If the citation is from a translated work, the original title and the year of its original edition should be stated:

Kristeva, J.: *Jazyk lásky* (La Revolution du langage poetique, Histories d'amour, 1974, 1983). Prel. J. Fulka. Praha: One Woman Press, 2004.

Almanacs:

Šišmišová, P. (ed.): *Translatologické štúdie. Teória, história a prax umeleckého prekladu v románskych krajinách*. Bratislava: Anapress, 2010.

Páleníková, J.— Šišmišová, P. (ed.): *Translatologické reflexie*. Bratislava: Anapress, 2010.

Contributions in a monograph or almanac:

Pašteková, S.: Premeny estetického kánonu a čitateľská pamäť. In Pašteková, S. — Podmaková, D. (ed.) *Kontinuita a diskontinuita vývinového procesu poézie, prózy a drámy. Premeny estetického kánonu. Konceptie literárnych dejín*. Bratislava: Veda, s. 116-122.

Magazines and periodical press:

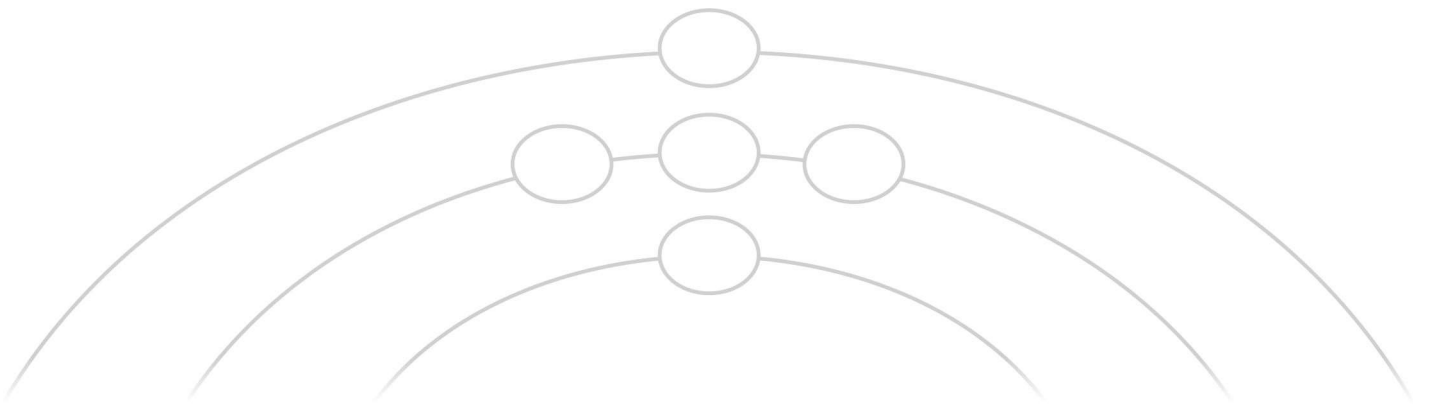
Dvořáková, A. — Žiaranová, R.: Utrpenie prekladateľa z druhej ruky. In *Revue svetovej literatúry*, roč. 20, 1984, č. 4, s. 95

Topol, J.: Prokletí nechtěných dětí. In *Lidové Noviny*, 10.4.2006, s. 6.

Citations of online publications:

Nouss, A.: Texte et traduction. Du sacre chez Jacques Derrida. <http://www.infoamerica.org/documentos_pdf/derrida03.pdf> [22.11.2010].

Tkačíková, D.: Když se řekne digitální knihovna... In *Ikaros* [online]. 8.3.1999. <http://ikaros.ff.cuni.cz/ikaros/1999/c08/usti/usti_tkacikova.htm>. [6.10.2000].



Also your advertisement could be here...

Acupuncture and Natural Medicine

