

# Acupuncture - as part of the traditional chinese medicine- in evidence based medicine; the present situation of research: results, doubts, solutions

## Abstract

**Introduction:** One of the most accepted CAM therapies, most well-known branch of the TCM / TCM, which flows intensive research a few decades in the US, Europe, even in China. Is backed by proven research results of EBM for properly as well.

**Objective:** To summarize the newer understanding of the mechanism of action and indications with regard to harmonization and closer to the TCM / TCM tenets of contemporary classical Chinese medical applying for.

**Method:** an international literature review, which CAMmbrella, the Pan - European Union project work package 4.-5. Based on its research, which took part in the work of the Department of Complementary Medicine, Health Science Faculty of Pecs University, as well.

**Results:** Acupuncture and TCM, are one of the most researched area of non-conventional, complementary therapies. We have already demonstrated convincingly established by the management of the majority of acupuncture point physiological responses. The mediator neurohormonal transmitters are already known about now. 40 have been identified which are involved in induced “dry needling” (=acupuncture) effect.

**Discussion:** The “Bridge” between the Eastern and Western medicine is the appropriate knowledge transfer, research and application. The performance of in-service training is a university competence. EBM has an efficient and effective use based on the quality of training in-service training, which is conducted in University for more decades. Further development of this training, quality education can only be realistic to achieve the goals (which effectively give rise to a dedicated University Confucius Institute).

Volume 4 Issue 5 - 2016

**Henrik Hamvas, Monika Havasi, Hamvas Szilard**

Department of Dietetics and Complementary Medicine, Pecs University, Hungary

**Correspondence:** Hegyi Gabriella, Head of Department of Dietetics and Complementary Medicine, Faculty of Health Sciences, Pecs University, 7463 Pecs, Vorosmarty u. 4. Hungary, Email drhegyi@hu.internetc

**Received:** August 24, 2016 | **Published:** November 28, 2016

**Abbreviations:** CAM, complementary and alternative medicine; TCM, traditional chinese medicine; EBM, evidence based medicine; SZOTE, University of Szeged - Faculty of Medicine; HIETE, Haynal Imre University of Health Science; PTE ETK, University of Pecs, Faculty of Health Science; AA, Acupuncture Analgesia; KM, Complementary Medicina; LI 4+ST 36, Colon LI 4 Hegu and Stomach 36

## Introduction and Definition

Acupuncture (‘dry needling’)<sup>1</sup> is one of the basic aspects of Traditional Chinese Medicine (TCM). Its classical base is presented by the “principle of energy flow system”, the recognition of the channels (in other words: meridians) and the points of mechanical stimulus, namely the puncture points – acupuncture points - on which the former is based. The application of this principle can be carried out by mechanical stimulus: needle puncture, massage, temperature stimulus, vacuum based suction, as well as by ultrasound, laser, etc. In China it has been known for centuries even about herbs on which meridian they are effective and whether they belong to the type of yin or yang, which means that in Chinese Phytotherapy the knowledge of channels and points is also taken into consideration.<sup>2</sup> Throughout the diagnosis process the examination of pulse plays an important role: by touching the arteria radialis on the wrist with three fingers both on the surface and deeply, valuable information is received on the organs representing the twelve main meridians. We

<sup>1</sup>It includes Chinese Phytotherapy, Cupping, Tuina massage, which constitute together TCM

<sup>2</sup>Materia Medica Institute, Peking, (with WHO support)

can say that we are talking about a diagnostic and therapeutic whole body complex system<sup>3</sup> based on a unitary theoretic foundation which is consistent in itself. Traditional Chinese medicine has already put down all these in writing in its 2600-year-old basic literature known as ‘The Yellow Emperor’s Classic of Internal Medicine’, which is the most important professional literature even today and was later extended. It is also important to mention the point system<sup>4</sup> of the ear – as microsystem – acupuncture, which was only discovered a few decades ago, since ‘...meridians meet on the external ear’ – as the above mentioned basic literature says. A newer recognition is the study and application of the Yamamoto<sup>5</sup> scalp system. Throughout the acupuncture process extremely tiny filiform needles<sup>6</sup> are put into certain so called ‘acupuncture points’ under the surface of the skin. The anatomical situation of a point is an entity which is based on classical descriptions, empirica, today’s biophysical measurements and new knowledge.

## Basic questions

A few questions – already answered and still unanswered - are awaiting to be clarified:

1. Do ‘acupuncture points’ really exist? What is a ‘meridian’ and how can it be explained in the classic synonym system?

<sup>3</sup>“Whole body complex system” -WHO terminology

<sup>4</sup>Paul Nogiere, French doctor, 1950, the terminology is accepted by WHO

<sup>5</sup>YNSA:Yamamoto New Scalp Acupuncture, Bristol, 1986, microsystem discovered and published byYamamoto Japanese professor

<sup>6</sup>Earlier the needles were made of gold or silver, but recently steel with thicknesses 0,30-0,40 gauge, length 1-5 cun (2-10 cm)

2. What is the essence of mechanical peripheral stimulus, the nervous and neurohumoral mechanism mediating acupuncture (eg. painkilling)?
3. Is there an acceptable and relevant professional literature proving the efficiency of clinical acupuncture?

Ad 1. Do 'acupuncture points and meridians' really exist?

Is it more efficient to treat an acupuncture point already known than to place the needle into a sham acupuncture point? By examining the efficiency of acupunctural painkilling, B. Pomeranz<sup>7</sup> (2001)<sup>7</sup> came to the conclusion that pains induced in acute, laboratory conditions both in humans and animals could only be efficiently alleviated by stimulating acupuncture points while in the case of treating non-acupuncture points there was not a really measurable painkilling observed. This is in accord with the fact that even the so-called placebo pills without active substance were only successful in killing pain in the 30 % of the cases. At the same time, in the cases of chronic pain this difference is not so obvious. A great number of cases is needed to achieve the statistical significance (a minimum of 122 experimental persons per examination), furthermore this issue has not been closed up to now. Also in Eory's experiments when applying the needle to points considered to have low resistance (acupuncture points are also described as having low resistance and higher impedance, see later) they were able to induce local warming on certain plants (monitored by using infra camera), while in the case of treating points not with low electric resistance the plants did not react with an intense growth.<sup>2-4</sup>

### Do acupuncture points have a specific anatomic structure?

According to the finding of a number of microscopic and electro-microscopic examination there is not a separate structure apart from our skin sense organ representative of special acupuncture points, but a bigger number of sensory nerve endings can be recognized at the indicated points, e.g. GAP junction.<sup>8</sup>

### Physiological and biophysical description of acupuncture points

In Europe it was the French Niboyet who first put it down in writing that the areas of the skin surface with low electrical resistance can be identified with acupuncture points.<sup>9</sup> The electrical resistance of human skin as well as its reciproc, namely conductivity vary within wide limits but compared with adjacent skin areas a significant difference can be measured regarding acupuncture points. Simultaneous factors influencing skin resistance must also be taken into consideration since a measurement can be hindered by several influential factors (temperature, surface humidity, calibration of the measuring device). During the measurement we apply a very weak measuring current. In our days 'point detecting' devices are already widespread based on the electrical resistance of the skin and, in case of an alternate current measurement principle, on the measurement of impedance. The German Voll-type point based method of electric diagnostics and the Japanese so called Ryodoraku ("good conducting connections") method are also based on skin resistance, but with a relatively strong measuring current we can only receive reference values, which means these measurements are not suitable for traditional clinical

diagnostics, however they give information on the operation of the so called 'control circles' in TCM.

The surface of the skin shows 30-100 mV potential difference in its areas where it is the surface to be considered more negative compared to the deeper layers. When measuring skin potential values acupuncture points are also measurable and bigger differences can be measured in these areas.<sup>10</sup> In case of damage a so called damage current is created depending on the potential difference mentioned above. This partially gives an explanation on the chemical and physical processes induced by the needle applied. The adverb 'partially' needs to be explained here. During acupuncture it is not only the damage potential that induces current but also the needle itself functions as a thermo element, since when applying the needle there is a more than 10 Celsius degree temperature difference.<sup>11</sup>

The electric measurements are reproducible, although the measured resistance decrease can only partially be explained by the thinning of the corneum, the denser of 'Gap junction' and the higher density of nerves and sensation. In the 70s the so far best indicator of the increased metabolism in points was found by the application of the supersensitive CO<sub>2</sub> respirometer – FREWIL - developed by professor of physiology V Frenyó.<sup>12</sup> The electrical resistance and the temperature of the skin when at work were measured simultaneously by examining the respiration of the skin. Its result is the following: there is a 52% interconnection between the respiration of the skin and the CO<sub>2</sub> content of the blood running in the capillaries. The physiological role of the significant amount of CO<sub>2</sub> emitted above an acupuncture point might be that it hinders the escape of thermo-energy by enforcing the micro greenhouse effect at the points (by which the relative 'low-thermal' acupuncture point picture on infracamera images can be explained). Bergman (1980) showed that 'acupuncture points' even have infrared emission.

What is the concept of a 'Meridian'? According to our latest knowledge it is a *virtual network system* which refers to the successive sequences of the recognized bioactive acupuncture points, so it is not a separatable and touchable anatomic structure. This notion is also supported by the newer approach that assigns the points of 'meridian' to the embryo structures of spinal cord segmentation in de facto application as well. What is interesting about the concept is that we could get familiar with the zones of Head at the end of the 19th century (in addition, in the same era they were also found by Zanicotti and McKenzie), furthermore we can meet its empirical experience and recognition in the situation of the sequential points on the 'Meridian' and its centuries old de facto application as well!

### What is the nervous and neurohumoral mechanism mediating acupuncture (eg.: acupunctural painkilling)?

The very first clear answer to the nervous mediation of low-frequency electroacupuncture (EA) applied via inserted needles was given by Chiang,<sup>5</sup> whose research is still going on. He stated that the stimuli of type 2 and 3 fibres leading to the muscle induces the so called "spreading" needle sensation that is in connection with the effect that gets disturbed by the strong muscle contractions created by stimulation. This explains why an electric stimulation with low frequency and higher current stability is important<sup>13</sup>. The other significant finding is that the induced anesthetic effect is not organ-

<sup>7</sup>Bruce Pomeranz, who was a professor of Department of Physiology at the University of Toronto, has received a Chinese award for his research in TCM in 1990

<sup>8</sup>Proved by H. Heine (professor of Anatomy at the University of Heidelberg)

<sup>9</sup>Point detecting devices developed from devices for the measurement of electrical resistance of the skin are based on this finding

<sup>10</sup>Areas from few square mm to five square cm

<sup>11</sup>With Shang's words (2001) the acupuncture points are the converging points of surface current

<sup>12</sup>Frenyó- Eőry, 1984

<sup>13</sup>Application of electroacupuncture in pain relief (Han, Academy of TCM, Peking, 1998)

specific. This is in accord with the following nervous mechanism in case of applying a low frequency and high intensity EA<sup>14</sup>.

An impulse is generated by the activated sensor receptor when a needle is being applied which first runs to the spinal cord then it advances upward through the ascending tracts then through the nuclei of thalamus to the cortex. The fibres responsible for the impulse transmission are myelinated type 2 and 3 afferents with a small diameter. They are responsible for the numbness and the feeling of fullness induced by the spreading needle sensation ( but the pain is mediated by the bare type 4 fibres). In case of an activation of skin nerves the A-delta fibres play a role.<sup>15</sup> In the spinal cord the activated nerve cell has a short segmental branch that is endorphinergic. This pre-synaptically inhibits either through enkephalin or dynorphin mediation but not through  $\beta$ -endorphin one, which means it blocks the transmission of the pain stimuli. Consequently, the enkephalins and the dynorphin may block the pain already at the level of the spinal cord. Next the needle stimuli advances through the ascending tracts to the thalamus in the spinal cord. In the peri-aqueductal grey matter (PAG) of the midbrain it activates the raphe nucleus in the caudal part of the medulla oblongata through enkephalin mediation. It sends back descending impulses in the dorsolateral (DLT) part of the spinal cord through monoamine (serotonin és norepinephrine) mediation to the cells of the spinal cord. Both monoamin mechanisms might take part in painkilling. The originally activated ascending tract in spinal cord also activates the nucleus arcuatus in the hypothalamus-hypophysis complex, while other parts of the hypothalamus receive  $\beta$ -endorphin from the hypothalamus itself. It effects through the blood current only to a small extent, it rather gets to the cell on a direct retrograde way without getting through the blood-brain barrier. Anyhow, the destruction of hypothalamus in experimental animals inhibits the creation of an acupuncture effect. The hypothalamus also releases ACTH in an equimolar amount with  $\beta$ -endorphin (since their precursor is common).

ACTH stimulates the adrenal gland to release cortisol, which explains the anti-inflammatory effect of acupuncture in conditions such as asthma, arthritis, etc. At the same time this little amount of cortisol does not have harmful side effects neither does it cause a positive feed-back.

The recent radiological diagnostic techniques (PET, fMRI) prove that acupuncture can activate further parts of central nervous system parts such as nucleus accumbens, amygdala, habenula, thalamic nuclei, etc.<sup>16</sup> Perhaps the most exciting period of research of analgesic effect of acupuncture was when it was evident that naloxon, which is an endorphin antagonist can inhibit the analgesic effect of acupuncture, too. In a study volunteer participants with artificially induced toothache were treated by manual stimulation of LI4 acupuncture point<sup>17</sup> to relieve pain. One group received intravenous saline, the other group received intravenous naloxon. None of the participants knew which group they were in. (This is a typical example of double blind clinical research.) In the first group the pain was eliminated in 30 minutes and the effect persisted longer than one hour. The pain did not subside in naloxon group in spite of dry needling. At the same time the participants of placebo group received placebo injection with the instruction that it was a strong painkiller medicine.

These participants did not experience any alleviation of their pain at all.<sup>18</sup> A subsequent study conducted by Cheng and Pomeranz<sup>6</sup> shows that an increasing dosage of naloxon causes increasing blocking of acupuncture analgesia (AA). Shortly after this it was published that the dosage of naloxon needed to block AA depended on applied frequency of electroacupuncture (EA). It is less in case of 2 Hz than in case of 15 Hz and comparatively lot more naloxon was necessary to inhibit pain relief induced by 100 Hz EA. Based on cross-tolerance studies it has become certain that there are different endogenous opiate mediations depending on the frequency of needle stimulation, and all this takes place via different receptors.<sup>19</sup> In 1985 an anti-opioid peptid was first isolated from bovine brain which was chemically equivalent to angiotensin II. Based on this knowledge the explanation of the antihypertensive effect of acupuncture compared with ACE inhibitors is thought provoking. The antihypertensive effect of opioids has long been known. Using the opioid as medicines is proved to be difficult because their elimination in the body is too fast. On the other hand if we inhibit the final synthesis of angiotensin II - ACE inhibitors are examples of this – it loses its antiopioid effect hence we can lower blood pressure, however it eventually happens due to opioid peptides of the body. Lowering blood pressure in the so called neurogenic stage of hypertension could be achieved more directly through opioids facilitated by acupuncture.<sup>20</sup>

### There are some known explanations of the effect of acupuncture:

- Augmentation theory – Acupuncture raises the level of triglycerides, certain hormones, prostaglandins, leukocytes, gamma globulins, opsonins, and antibodies. (immunostimulating effect)
- Endorphin theory – Acupuncture stimulates the production of endorphins (especially the enkephalins, and dynorphins) (analgesia)
- Neurotransmitter theory – Acupuncture can influence on the production and secretion of several neurotransmitters (serotonine, noradrenaline) (depression and emotional diseases, the decreased level of serotonin may lead to weight loss)
- Circulatory/vasomotoric theory – acupuncture liberating vasodilant substances (especially histamin). (oedemas, neuropathy and post traumatic regenerative conditions)
- Gate control theory – by acupuncture stimulated somatosensoric A-delta fibres on the level on interneurons of spine lock the thinner viscerosensor C fibers transmitting the incoming pain information, by which they prevent its spreading into higher level center and prevent the perceiving of pain (anesthesia, analgesy, Diffuse Noxious Inhibiting Control, -le Bars, 2003)

### Breakdown of today's more acknowledged and thorough theories:

1. Local segmental effect: axon reflex, vasoactive neuropeptides: mostly calcitonin gene related peptid (CGRP), Substance P (SP) Lundeberg, Kashiba, Schaffer, Calsson, 1991,1992, 1998, Endorphin -antiinflammatory effect (Stein, Yassouridis, 1988).

<sup>14</sup>Pomeranz, 2001

<sup>15</sup>The gate control theory of Melzack and Wall

<sup>16</sup>Yamamoto, T: YNSA publications (1998, 2004, 2010)

<sup>17</sup>The space between I and II metacarpus is the one of the most notable point to pain relief („Hegu” vagy „Hoku”)

<sup>18</sup>Reminder: placebo is only effective in maximum 3 % of the cases in acute pain

<sup>19</sup>Han, 2008. Peking, TCM Academy

<sup>20</sup>Naturally it may be asked whether effect of acupuncture lowering blood pressure

2. Trigger points (70% of them are acupuncture points) treatment ability of myofascial pain syndroms (D.Irnich, Bayer, Charitee Uni, 2002), myofascial trigger points identical with 70 % of acupunctural points (S.Birch 2003), local trigger points - Aschi points, detoning effect to trigger points (Hong, 1994)
3. Regional perfus changes : akupunktüre/elektroakupunktüre (Lundeberg, Karolinka Institute, 1999), periferal vasodilatation (Janson 1989), M-Raynaud electrostimulation, „segment-reflectoric“ effect (Sato, 1995, Smidt, 1973), local tissue mediators role (CGRP, ect.)
4. Nociceptive afferent inhibition: intensive painful stimulus, A-delta fibres (Sandkuhler, 2001) pain release as observed on animals (Anderson/Lundeberg, 1995), the result is a long lasting blockage of disturbance on A-delta afferent fibres (Liu Chen, Sankuhles, 2000) , (Toda/Ichioka, Liu, 1983).
5. Melczak-Wall Control gate theory: this time has been added and adapted neuromatrix theory. „Gate control“ theory has been added by „neuramatrix“ theory, 1999. Differences between excitations of A-delta fibres and A-beta fibres , conduction velocity, inhibition of heterosegmental nociceptive stimulus (Sandkuhler, 1996) they are the part of supraspinal descending inhibiting mechanism.
6. Segmental reflectoric effect: somatovisceral reflective circle, converging of nociceptive neuron population in spinal cord – Shu points (Janik/Habler, 2002), viscerocutan-visceromotoric reflex-Head zones (Head, Zaricott, McKenzie, 1987), connective tissue tone alteration in organ's projection zones (Zimmermann, 2004).
7. Systemic effects: activating of supraspinal descending braking system (Cao, 2002, Tagedhige, 1992), psychic/psychical effect, effect on stress pain (B. Pomeranz, 1996), stress analgesia: through stress-induced reduction of pain sensitivity (Fancelov, 1999), short time activation of endorphin system (but in such an extent explanation of the long term effect is not enough)
8. DNIC: „pain prevents pain“ (La Bars, 2002), Villanueva, La Bars, 1995: „acupuncture painful stimulation prevents more pain...“
9. Endorphin system: endorphinerg system activating (Han, Xie, 1984, Peking), (Tageshire, Pomeranz, 2002, Han Terenius, 1982 - the most accepted explanation until this time, decrease of endorphin system regulation, chronic pain syndroms disregrative changes (especially lumboischalgic pain, haedache, fibromyalgia).
10. Cerebral effects: fMRI, PET, limbic system activate (Hui, 2000, Hui 2005, Hsieh et al., 2001), hypothalamus, periaqueductal grey matter, Gyrus cinguli, cerebellum, semsomororical cortex (Gareus et al., 2002, Biella et al., 2001, R. Niemtchow, 2007), neural sigmal modulation in cerebrovascular excitement – migraine effective (Becker, 2004).
11. Autonom vegetative neural effects: under acupuncture done sympatycotomy, followed by strenghtened parasympaticotonus (Ernst, Lee, 1986) causes „poststimulative sympaticolysis“ (Anderson, Lundeberg, 1996).
12. Endocrine effects: Hypothalamus activation (Hsieh et al., 2001), the role of hypothalamus-hypophysis axis, explanation of humoral endocrine changes, increased level of oxytoxin after EAV<sup>22</sup>, cervical release during childbirth, menses settlement, premenstrual syndrome treatment.

## Do we have acceptable data about the clinical effectiveness of acupuncture?

Clinical effect of acupuncture can be assessed only based on human individuals, thoroughly prepared by observation. Later we follow basic rules of evidence – based medicine and then verified and confirmed clinical impact studies. Regular overview summarizing on the evidence based medicine

Overall requirement for effectiveness confirmation is a sufficient amount of performed and well-prepared, random and controlled experiments. Until the 90's experiments of this kind done on individual diseases and its regular evaluation were called metaanalysis.

Today, there is a specific statistical method, where individual examinations are an examined entity. Balanced usage of all the until now gained knowledge about medicine based on facts (evidence based knowledge) is conscientious and open to patient and based on current proven facts decides on the best possible treatment for patients. (EZZO et al., 2001).<sup>19</sup> It is expected from the doctor that he has possibly the best clinical experiences in given specialization and is educated by the best research results. In system included publications, whatever were the results, have to match certain specification requirements. Only then are we able to guarantee objective and unbiased assessments, thanks to which we are able to prevent pointless repetition of experiments, when the result of the repeated experiment isn't better, therefore it doesn't provide us with newer information from the previous. New outcomes of working hypothesis formulation are important for future research.

In order to eliminate possible bias we use so-called sensitivity analysis. There we compare and examine better and worse results of individual experiments and those are then compared only with results and outcomes of the better experiments. When the outcomes from the previous one are “more optimistic” we are most likely dealing with bias. We are also calling it biased when the outcomes – whether intentionally or not – are evaluating the one and the same experiment numerous times (for example: when the experiment was published more times but under different names.)

CAMbrella - Pan-European research project<sup>23</sup> included one worksheet, which was discussing this topic in the recent past, when they analyzed approximately 17.000 articles.<sup>24</sup>

## The proven clinical efficacy of the acupuncture

The acupuncture treatment means a diagnosis of the patient as an individual and a planned treatment according to the given clinical pattern. This also means that according to the unique, extremely detailed Chinese pulse and tongue examination there are no two patients totally alike. In this regard, it is a great task to contract the results of certain experiments but the randomization itself is also difficult. While certain problems are always treated on the same point (for instance nausea and vomiting are treated on Pericardium-6 acupoint<sup>21</sup>), in case of a chronic pain syndrome different treatment protocols must be followed depending on the accompanying symptoms. In order to apply the right acupuncture treatment the criteria is not only the selection of the right puncture points but also the consideration of further factors:

Linde et al. (1996) examined 5 circumstances: 1.) the selected points 2.) the total number of treatments 3.) the number of weekly treatments 4.) the duration of one single treatment 5.) the inducement of needle sensation (in Chinese: De Qi sensation)

<sup>21</sup>“Nei Guan”: It is located on the anterior forearm, two cun above to the wrist crease in the middle

The adequacy of acupuncture can also be estimated by the minimum number of acceptable treatments. According to the criteria of Molsberger and Bowing (Ezzo et al. 2001) it means at least 10 sessions of treatments in which each single treatment session is a minimum of 15 minutes long and the record of the used acupuncture points. Only 16 out of the 88 clinical studies referring to locomotor and/or neurological diseases examined by them met the above criteria furthermore only 2 of them fulfilled the criteria of a controlled experiment.

Patel et al. suggest that for testing the adequacy of acupuncture the criteria should be the ones predominating in the case of experiments with more positive reactions. Although this approach in itself does not give an answer whether the applied acupuncture has been effective enough against the actual disease, it can be observed that experimental group members preferred treatments tailored individually to selection of points according to the standard formula. But how to integrate individual treatments into controlled experimental methods? 'It feels like giving medicine to patients in individual doses instead of the prescription.' (Ezzo, 2001) This contradiction can be dissolved by dividing the treated group into sub-groups. The certain sub-group members will be treated on the points according to the formula.

Following the latter approach it is known that there is no connection between the number of treated points and the successfulness of a treatment, however scientists found a statistically significant relation regarding the number of treatments and the successfulness of the cure. Getting less than 6 treatments was never efficient enough, but those patients having undergone 10 treatments recovered more successfully.

## Accepted treatability of certain clinical pictures through acupuncture

Summarizing the results of meta-analyses carried out so far, we can say that, although to a limited extent we can accept it as a fact ("limited evidence") that acupuncture is more effective than pure placebo, sham acupuncture or traditional 'western' medicine in chronic or acute pain syndrome. (Ezzo, 2001, Pendrick H, Harvard Medical School, 2013).

According to the efficacy examination of acupuncture treatments for lumbal pain acupuncture is a suitable method but only recommended as a complementary treatment. (Molsberger, 1998, Birch, 2001, Hegyi, 2013).

It was found after the statistical evaluation of 7 studies on fibromyalgia that acupuncture is much more effective than (8) sham acupuncture, but there was not a long-term follow up carried out in the examined studies. (Berman et al., 1999, 2013).

Ernst et al. (1998, 2012) also found using acupuncture is effective to treat acute toothache in a systematic review of 16, than 20 articles.

In a systematic review of 22 experiments Melchart et al. found the use of acupuncture was superior in treating *headache* compared to sham acupuncture. They came to the conclusion that, although there is not sufficient data to prove that acupuncture is better than treating with medicine, patients with recurrent headache can be encouraged to try out acupuncture (1999). Its application is even more recommended to treat tension headaches (Han, Cheung, 2013).

In a systematic review of 33 studies suggested that in case of nausea and vomiting the stimulation of Pericardium-6 acupoint (through massage, needle, etc.) itself is enough to achieve significant effect (Vickers, 1996). The result contributed a lot to the fact that after Nixon's visit to China in 1998 the American National Institute

of Health (NIH) came to an agreement to recognize acupuncture as a legal treatment (the establishment of NICAM<sup>22</sup>). It is interesting that in the 4 experiments when patients were stimulated on this point while being anesthetized, nausea was not reducible. Perhaps on this point there is a considerable psychological effect manifested as well, that supposes the conscious mental state.

Based on 4 controlled clinical experiments we can state that if we include acupuncture in the common *stroke rehabilitation treatments*, the chance of a successful rehabilitation significantly increases, in addition the cost of post treatments can also be reasonably decreased (Birch, 2001).

By the examination of patients in controlled clinical experiments we can conclude that: there is sufficient data provided to state that acupuncture and in particular the formularized form of ear acupuncture treatments are suitable to cease *alcohol addiction*<sup>23</sup>, furthermore addicts can be more motivated to go on with other therapies (Bullock et al., 1989). On the other hand, according to Birch (2001) the role of acupuncture is promising but contradictory regarding patients with cocaine and opiate addiction. Further research is required in this field. It is worldwide applied as a complementary treatment for reducing withdrawal symptoms.<sup>24</sup>

According to 4 controlled, randomized clinical experiments it can be said that acupuncture as a complementary treatment can be recommended in treating *angina pectoris* (Birch, 2001). The study recommends acupressure as well, which can be carried out as a self-treatment too.

In case of *frequent urination, incontinence, recurring lower urinary tract infection and kidney stone* acupuncture can be recommended due to having significantly less side effects than common pharmacotherapies.

The relevant literature (Birch, 2001) is about the positively influential intervention to ease delivery and cervical dilatation in case of breech birth and transverse lie (only in case of multipara pregnancy). Birch evaluates 3 studies in his work already mentioned. Based on his studies it can be said that acupuncture is useful for *painful period* (dysmenorrhea), *sterility* (due to amenorrhea and luteal insufficiency) and for reduction of *hot flushes during menopause*, although there is a so far insufficient controlled study provided for a systemic review. Despite this fact its application is successful with a lot of patients.

Allen et al. (1998), then others too (Jalinitzhev, 2012) proved that acupuncture is significantly positive for women with depression. Its application in drug addiction already discussed also belongs to the issue of psychiatry and addictology (9), in which it decreases vegetative symptoms during treatment.<sup>25</sup>

## Based on case reports and randomized controlled trials acupuncture treatment is applicable in the following diseases: (source:WHO, 2007)

- allergic rhinitis, biliary colic, dysentery
- cramps caused by acute bacterial enteric infection
- depression like mood disorders, sleep disorders

<sup>22</sup>National Institute of Complementary and Alternative Medicine, www.nicam.com

<sup>23</sup>Actually it only lowers the withdrawal symptoms

<sup>24</sup>Lincoln Hospital, NY-City, Bronx, Dr. introduced by Dr. Smith: NADA program

<sup>25</sup>NADA: National Antinicotine and Drog Acupuncture treatment (introduce by Smith, Bronx, NY City, Lincoln Hospital, start of the international program)

- depression related to chronic disorders and/or conditions (e.g. post stroke)
- dysmenorrhoea, menstrual cramps
- epigastric pain, (peptic ulcer, acute and chronic gastritis)
- facial pain (with different etiology), prosopalgia, craniomandibular dysfunctions, temporomandibular joint disorders, neuralgia (10,11)
- headaches (especially tension-type headache)
- high blood pressure (essential hypertenison)
- support and induction of labor: facilitation of dilatation stage, correction of fetal position
- knee pain, low back pain (discus hernia, discopathia, postoperative pain)
- shoulder and neck complaints (neck-shoulder girdle syndrome)
- leukopenia
- vomiting and nausea (18,26,38)
- renal colic
- postoperative pain syndromes, postoperative nausea (38)
- temporomadibular joint complaints, pain relief before and after dental treatment (11)
- soft-tissue rheumatic conditions, tennis-elbow, lumbago (27, 29)
- stroke, improving the residual symptoms of transient ischaemic attack, rehabilitation (33)
- habilitation, mental and movement development of disabled children
- lability of autonomic nervous system, increased sympatheticotonia

### Outlook and its future – situation in Hungary

Today's "modern" acupuncture methods combine classical, which methods are evolved based on the empirical, and modern, which are evolving on the modern technical methods. This method is also e.g. Soft Laser Biostimulation<sup>26, 27, 28, 29, 30</sup> Laser Acupuncture, which especially with children and elderly replaces induced stimulation. These patients tolerate the laser application better. In case of electroacupuncture we use electric current pulses to induce stimulation. Very often, we use the device also to find the acupuncture points. The effect of magnetic field on acupuncture points is also observed.

Of course, neighboring countries to China (mainly Japan, Korea, Vietnam) also took on acupuncture. In these three countries they developed and extended different techniques, depending on their specific needs. For example Japanese use very thin needles, so called filiform needles, which are injected through a skin with a tube.

In Vietnam they use also very long needles, 20 to 30cm long (for example from both sides of spine longitudinally). This technique is local and Chinese only adopted it and by this they both are influencing its development. In so-called Embedding acupuncture absorbable monofilament sewing sutures are used, which are applied on individual points, and for approximately 3 weeks are being resorbed, and this is causing a stimulating effect. By this it is possible to prevent frequent needle application, especially with children and elderly.

TCM as a part of medicine is accepted and applied in 122 countries of the world, and its popularity is increasing, thanks to the strategy of the current Chinese government. Since 1986 in Hungary, can a doctor be educated in this specialization only in HIETE, later in SZOTE, or in PTE ETK, because the order 11/97 NM. and government notice 40/97 rules, that the complementary medicine is a healing method, which can only be done by a doctor with a diploma, what means it is accepted like a health activity.<sup>25,28</sup>

Apart from that, after finishing a two year long studies the doctor receives a diploma, which authorizes him to request an authorization to operate an independent practice. Acupuncture section of TCM in Hungary is approved and financially covered by the state insurance as part of the rheumatology field, but only in state health facilities. Some of the health insurance companies refund these treatments, but only with the additional health insurance.

Because of these facts, education is part of the university education, which guarantees necessary level of knowledge, and for the future it is therefore important to keep it at such a level. Therefore it is reasonable to keep it at the level of Bachelor and Master of Science. We also need to emphasize that our goal is not to educate "complementary doctors, workers (professional staff)". Person, who chooses to study medicine, should firstly get to know the Western medicine. After gaining sufficient amount of knowledge and experience, one can then focus on individual fields of Complementary medicine,<sup>31, 32, 33, 34</sup> and use them later on. We find useful the sharing and passing on of experience from the authentic source to the specialists with EU diploma, who are interested in broadening their portfolio of healing abilities which are beneficial and safe for the patient. It is also important – mostly per request of the university scholars - that at the universities' students are getting information from authentic sources about given topic, not only partial, often very distorted information.<sup>29-35</sup>

From this process it is clear, that it is necessary to keep increasing public awareness about topics of healthy life style, keep developing system of education and build a strong and stable position of complementary healing. Prerequisite for adequate education is responsible, specialized and ethically accurate medical professional behavior, which guarantees integrated use of both approaches in use. The term complementary medicine needs to be officially added as the additional option to the standard healthcare. It does have an important spot in the areas of healthy lifestyle counseling, in improving of health culture of public, in prevention of common chronic diseases, in curing early symptoms, but it also has its place in rehabilitation and in curing chronic degenerative problems in geriatric patients. Mostly in cases where due to chronic degenerative diseases of musculoskeletal system there is high usage of medication and interaction among the medications occurs.

<sup>26</sup>National Institute of Complementary and Alternative Medicine, www.nicam.com

<sup>27</sup>only thy symptoms of withdrawal moderates in fact!

<sup>28</sup>Lincoln Hospital, NY-City, Bronx, Dr. Smith: NADA program

<sup>29</sup>NADA: National Antinicotine and Drog Acupuncture, (Smith , Bronx, NY City, Lincoln Hospital, international program stated)

<sup>30</sup>Hegyí, G: Mechanic and electromagnetic biostimulation (Mechanikus és elektromágneses biostimuláció), PhD thesis, 2000, Szt. István University

<sup>31</sup>We applied this technic 26 years in Yamamoto institute in Budapest especially in handicapped development movement children and after stroke rehabilitation in older patients

<sup>32</sup>Confucius Institute founded for TCM education and research from

<sup>33</sup>from 1986 is education officially approved in Hungary in this topic

<sup>34</sup>KM=Complementer Medicina (CAM)

By recommendation of WHO, EU CAM Roadmap and Hungarian Academy of Sciences Medical Department the following task have been set:

- Educate doctors in Traditional Chinese medicine (acupuncture, tuina), trained paramedical staff in acupuncture
- Educate doctors and trained therapists in manual therapy – tuina massage
- Educate doctors and paramedical staff trained in Chinese phytoterapy
- Educate doctors and paramedical staff trained in other preventive health maintenance advisory and rehabilitation

Also from the historical medical point of view it is important to provide complete point of view on individual philosophical aspects of healing methods and its forms (Ayurveda, Tibetan, Chinese, folk eastern kinetic and massage healing techniques) but also about those techniques – even with critical standpoints – which theoretical explanation isn't until today unified. Conditions of research CAM can therefore be supported and executed only in the area of academic institutions – universities. There are accessible sufficient scientific and practical resources, which allow the research also in these areas, on the home university field (similar American organization NICAM has current yearly budget of 122 mil. dollars)

Education and postgraduate education of doctors and medical staff with diploma takes place naturally at universities, education of paramedical staff takes place at GYEMSZTI-ETI, or at other than through ÁNTSZ (The National Public Health and Medical Officer Service NPHMOS) certified learning centers.<sup>35-40</sup>

College of complementary medicine takes part mostly in development of curriculum, in pregradual studies, which provides education of students in given topics, continues in educating of doctors for the future. Currently, at the only one workplace in the country, which also works like a „Methodological Center“ they also build the post gradual studying plan, necessary minimal requirements for given rules. Since 2004, college regularly maintains and deepens international relations (mostly with Chinese HUU – Hebei United University of Science and Technology - College of Clinical Medicine, Tangshan, Hebei province, Charitee University of Munchen, University of Bristol, Exeter CAM Institute, Chung Gun Memorial University, The Institute of Complementary Medicine (IKOM) University of Bern, South-West University in London).

## Summary

Acupuncture in a wider meaning like TCM is one of the not so conventional healing methods, which is currently scientifically the best-analyzed field. In European union it is officially accepted and its usage is in a different extent regulated. It is officially used in 122 world countries (Figure 1-2)<sup>35</sup>. Basic research already today provides convincing data about the existence of acupunctural points.<sup>40-42</sup>

To some extent functions of neurotransmitters are clarified, currently approximately 40 of those that play a role in by acupuncture caused effect are identified. For years it's been known that stimulation of individual peripheral acupunctural points causes activation and deactivation of specific parts of brain<sup>36</sup>. Despite that, there are still a

lot of unknown questions regarding clinical effects of acupuncture. It is caused by a small amount of well-controlled, randomized, double blind experiments in this field<sup>37</sup>, but Conceptual barriers are appearing. Acupuncture is hard to formulate, individual healing form, which is hard to apply on chosen groups of uniformed healing processes. Still, it is internationally known and people are in an increased amount demanding its application. Health care providers in the EU are also showing interest in this topic. Basic prerequisite for accurate usage and its effective application are rooted in regularity, education and more education on an accurate level, which for tens of years have been done by universities. Only continuing support for such education and continuing increase of the quality is the right path in accomplishing of quality education (for this purpose a good quality basis is given by the foundation of Confucius Institute University of Pecs, Faculty of Health Science).

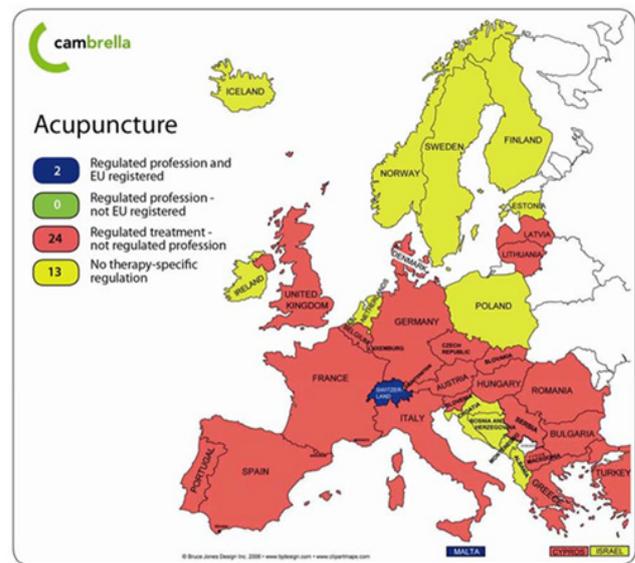


Figure 1 Regulation of acupuncture in EU<sup>24</sup>.

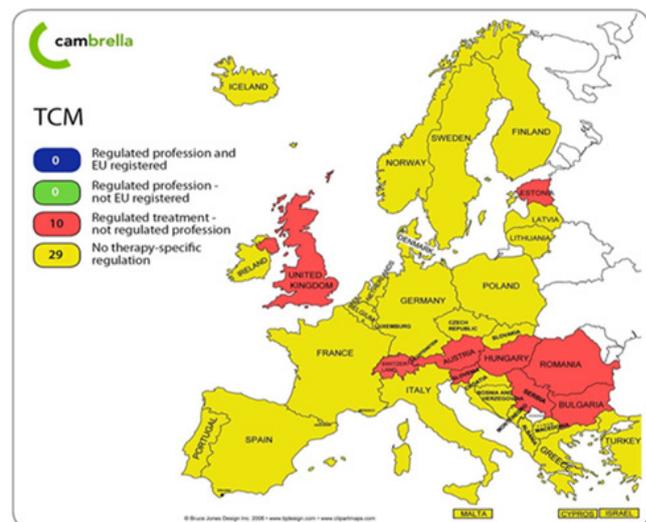


Figure 2 Complex traditional Chinese Medicine (Acupuncture, Herbal medicine, Tuina massage, Moxibustion, Cupping) regulation in EU.

<sup>35</sup>MTA Resolution of the medical department, 2003, 2008: "science based medical entity"

<sup>36</sup>fMRI studies are now justified in each puncture areas of the cortical activation in the field

<sup>37</sup>Pulak Ghosh, Paul S. Albert: A Bayesian analysis for longitudinal semicontinuous data with an application to an acupuncture clinical trial, Computational Statistics and Data Analysis, 2008.

## Conflict of interests

The authors declare that there is no conflict of interests.

## Acknowledgments

None.

## Funding

None.

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