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A new approach to healing headaches: 3 coMra-Therapy

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ABSTRACT

If you have had terrible headaches for many years and have been diagnosed with migraine or some other type of primary headache, you were probably told that nothing can be done, apart from trying to manage the condition with medication. And perhaps there is a measure of truth in this, given the current prevailing understanding, or rather lack of one, of causes of such headaches.

But it is time to critically reassess what we know about primary headaches in the light of the fact that we are feeling and thinking beings, as well as the high energetic costs of emotional and mental activity that we place on the nervous system and the brain.

I propose that in seeking a cure for headaches we consider ways of how to support an active and positive stance towards healing from the person concerned, by using a holistic technology that directly and non-invasively supports the impaired cellular processes involved in the manifestation of headaches.

In parts 1 and 2 of this article I put together experimental observations and subjective experiences to lay a foundation for a new and holistic view of primary headaches. In this third and final part of the article I summarise this view and share my understanding of how coMra-Therapy can play a most decisive role in a holistic approach towards healing and curing even the most debilitating headaches.

INTRODUCTION

If you have had terrible headaches for many years and have been diagnosed with migraine or some other type of primary headache, you were probably told that nothing can be done, apart from trying to manage the condition with medication. And perhaps there is a measure of truth in this, given the current prevailing understanding, or rather lack of one, of causes of such headaches.

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In parts 1 and 2 of this article I put together experimental observations and subjective experiences to lay a foundation for a new and holistic view of primary headaches. In this third and final part of the article I summarise this view and share my understanding of how coMra-Therapy can play a most decisive role in a holistic approach towards healing and curing even the most debilitating headaches.

Before getting into technicalities, let me present an imaginary analogy that may help you to understand this novel concept of primary headaches:

"My laptop used to work normally for many years until I noticed that it started to slow down and run hotter than usual. For several months I tried to ignore the heat and kept working on the laptop, but later it started to hang up intermittently in the middle of very important work and became too hot to keep on my lap. Eventually I took the laptop to a repair shop where I was told that all the hardware seemed to be fine, apart from Central Processing Unit (CPU), which was running unusually hot. Hmmm...

In searching for the problem I found out that the CPU was running at almost 100% all the time! Since the CPU is the "brain" of the computer I looked at the installed software and saw many totally unnecessary programs running in the background and keeping the CPU fully loaded. Once I removed the clogging software the CPU temperature dropped. But eventually I also had to replace the CPU and several other components, because after running very hot for so long they had become damaged"

With coMra-Therapy, as you will see below, we are giving the brain the necessary support to restore its normal functioning and to remedy the related damage throughout the body. Therefore, we have to look closely at the "hardware", the physical brain and its operational needs. At the same time, as feeling and thinking beings we also need to take responsibility for what we are asking of our nervous system and the brain. The mental and emotional "software" accumulated over a whole lifetime loads the brain with so much work that it exhausts itself in trying to meet the "computational" demands.

TWO-FOLD NATURE OF PRIMARY HEADACHES

The initial cause of primary headaches lies purely within the subjective realm of how a person is feeling about himself or herself. Although the challenge can be triggered by someone else as in, for example, a wife feeling invalidated by her husband, it is the subjective interpretation of the event that plays the definitive role. Headaches commonly stem from feeling bad about oneself, guilty or feeling somehow inadequate and therefore useless. See ***part 2*** of this article for more details.

To clarify, an experience of negative feelings by itself does not have to lead to a headache. If I feel guilt about an event in the long gone past I can try to reach peace within myself by learning from my mistakes with all the humility that I can muster. If I have most terribly "failed" in a current task, rather than beating myself up I can shift the focus to seeing what caused me to trip up, in order to do things differently in the future. In this sense the negatively-coloured feelings play a valuable role in our lives, because often they point to an unresolved conflict, skewed perception or a lack of knowledge.

But when such negative intensity is not handled constructively, it can very quickly become completely overwhelming and drain energy in a literal sense, because neuronal activity is very energetically expensive. Although the brain weighs only 2% of total body weight it consumes 20% of total energy production [*1*]. Of the total amount of energy used by the brain about 80% is used for the generation of electrical signals that travel through the nervous system [*2*]. In comparative terms, the energy expenditure of the signal activity in the brain equals the energy usage for a human leg muscle to run a marathon [*3*]! Note that if we are awake and perform no specific tasks, the brain still "runs its marathon" in the background. Only in a deep state of induced anaesthesia does brain energy usage drop from the baseline by about 45% [*4*]. Therefore, in cases of exceedingly strong and prolonged stress the purely mental and emotional experience becomes expressed in neurons as bioenergetic deficit that can be felt firstly as fatigue, neurologic malfunction (migraine aura) and eventually as an acute headache attack. See ***part 1*** of this article for more details.

If the person listens to the increasing fatigue or pain sensation and stops the original mental/emotional pattern, then this transient bioenergetic deficit can be restored naturally and without any long-term ill effects. However, headaches can turn into a chronic and extremely debilitating disease when there is prolonged resistance to finding out why one feels in such a way and no action is taken to resolve the challenge.

Unresolved challenges are very likely to reappear and cause more headache episodes. The accumulation of wear and tear on the overtaxed energetic metabolism in cells can eventually lead to chronification. The disease becomes manifested in abnormal structural changes in the mitochondria and consequently in the limited ability of neurons to function normally under elevated energetic demand (bright lights, loud noise) or under even mild physiologic stress (dehydration, lack of sleep, menstruation). This bioenergetic deficit in the brain spreads through the body via hormonal and nervous links and leads to a host of symptoms, such as aura, nausea, numbness, chronic fatigue and so on.

An important piece of evidence further supports this hypothesis of the two-fold nature of primary headaches: the effect of placebo on headaches.

Numerous clinical trials of acute and preventative headache medication have established that headaches responds very well to placebo [*5*]. In placebo-controlled blind clinical trials participants do not know whether they are receiving an active drug or an inert substance (placebo drug). In triptan trials up to 50% (!) of participants reported headache relief 2 hours after taking placebo [*6*]. In addition, it is generally established that red placebo tablets are more active than blue placebo tablets. Placebo effects are stronger in injections than when taken orally. In other words, the patient's perception of how effective the drug is has a direct and measurable impact on headaches. And this is a logical conclusion if we accept that the initial cause of headaches lies in the person's perception and generated emotions.

The second key finding from many headache clinical trials is that the placebo effect on headaches is greater in mild pain than in severe pain, in children than in adults, in tension-type headache than in migraine. This finding strongly supports the hypothesis that in more severe forms of primary headaches that develop generally only later in life, the secondary damage to cellular bioenergetics becomes a dominant cause, even though the original emotional component may still be present.

In a nutshell, more severe forms of primary headaches are no longer purely a matter of perception and behaviour. The pain and numerous neurological symptoms stem from the secondary cause of the disease - impaired bioenergetic metabolism in cells.

SEEKING SOLUTIONS

I propose that the healing of primary headaches that leads to cure should involve conscious and methodical work in:

1) Recovering impaired bioenergetic metabolism at the cellular level;
2) Providing a regenerative message to the nervous system;
3) Resolving the underlying cause in mindset and behaviour.

Note that such an approach to healing headaches implies that if we accept the subjective origin of headaches at least as a hypothesis, we can no longer see ourselves as victims of genetic inheritance or as helpless consumers of expensive and often dangerous medication. Instead we need to seek ways of how to support and nurture an active and positive stance towards healing from the person concerned.

So how we can address the three aspects of healing headaches outlined above in such a way that will empower the individual and help him or her to overcome feelings of inadequacy?

Firstly and especially in the case of severe and frequent attacks, the impaired energy metabolism appears to be a problem of primary concern. It is very hard to think about one's behaviour whilst experiencing excruciating pain! Suppression of pain with medication may have a limited role as an emergency short-term solution, but pain-killers do nothing to resolve the underlying bioenergetic deficit. The question we should be asking is: What do we know about non-invasive ways of stimulating bioenergetic deficit? Can we address the bioenergetic needs of cells, rather than doing our best to ignore them?

The second aspect of healing relates to the profound and multi-faceted way of how negative emotions impact our physiology. Clinical trials have shown that suppression of negative emotions with antidepressants has some preventative effects on migraine. But this highly invasive method is addictive, riddled with negative side-effects and costly. We need to turn our attention to alternative non-invasive ways of delivering a soothing, relaxing and regenerative message to the body.

And last but not least, it follows that a complete cure of tension-type headaches or migraine can only be possible when there is a long-lasting and profound change in the mindset and behaviour – a reloading of the "software". To change one's mindset and behaviour is much more difficult than gulping drugs, because habitual ways of responding to our life challenges are often subconsciously copied from our parents. Moreover, feeling bad about oneself in one way or another is nearly universal in humanity and all of us have to walk the thorny path of learning to love ourselves unconditionally. But after even the smallest victory along this path, the sense of liberation and freedom are unmistakable and inspiring!

The topic of working with mindset and behaviour is very large and outside of the scope of this article. I would

like to mention that there are a number of biobehavioural therapies that have demonstrated very good results with headaches and have been endorsed by the American Medical Association and the World Health Organization [*7*]. Various relaxation techniques, such as progressive muscle tensing and relaxing are very effective in easing the negative intensity and stress and can be easily self-taught or learnt from a professional. Cognitive-behavioural therapy is focussed on identifying negative thoughts and implementing behavioural changes, and therefore has direct relevance to the holistic approach to healing headaches.

NONINVASIVE STIMULATION OF BIOENERGETIC METABOLISM

Generally speaking, the energy in brain cells depends on three factors:

1) Supply of oxygen and glucose to cells;
2) Efficiency of production of the universal fuel, the ATP molecule;
3) Expenditure of cellular ATP stores for various cellular functions.

One can expect that normalisation of any of these three factors may ease headaches. Indeed, oxygen therapy has been shown to effectively stop acute attacks [*8*]. Several supplements (magnesium, riboflavin, coenzyme Q10 and alpha lipoic acid) that are known to enhance bioenergetic metabolism and production of ATP in cells have also been proven to have preventative effects on headache attacks [*9*-*11*]. And lastly, one can simply reduce energy expenditure of intense neuronal activity by using biobehavioural therapies such as relaxation.

But are there any other ways of stimulating bioenergetic metabolism?

Stimulation of ATP synthesis with low-level laser

Light plays central role in energy metabolism in many living organisms, such as plants. Plants convert the energy of light into chemical energy and store it when energy-rich molecules, such as sugars, are synthesised from smaller molecules of carbon dioxide and water. Animals, including humans, evolved to use the energy stored in foods to power the body. Blood supplies cells of the body with digested nutrients and oxygen. Inside the mitochondrion, a specialised cellular compartment, sugars are broken down back into carbon dioxide and water, while releasing energy that is used to synthesise the molecule of ATP. The molecule of ATP, in turn, is used to power practically all mechanical and chemical processes in the body, be it muscle contraction or the firing of electrical signals by neurons.

The textbook theory presented above says that the cells of our bodies do not require light to synthesise ATP. However, experiments have shown that light can stimulate this most crucial process! The first scientific breakthrough was made after the discovery of the effect of low-level lasers on animal cells *in vitro* (in test environment). Laser irradiation increased the ATP content in cells by up to 70-90% [*12*]! This is a very large gain, achieved without any invasive procedures but merely through the application of light. Later, *in vivo* (in living organism) experiments confirmed that near infrared irradiation, for example, can restore cortical ATP content after embolic stroke [*13*] and traumatic brain injury [*14*].

There is a vast literature explaining the basic biochemical processes involved in the effects of Low-Level Laser Therapy [see reviews *15*; *16*], but the key fact for our discussion is that light of certain wavelengths (red and near infrared) can stimulate mitochondrial function [*17*; *18*].

These very important discoveries opened a whole new area of possibilities for treating acute and chronic damage to different type of tissue and particularly in the central nervous system. Near infrared light can easily penetrate the skull and stimulate ATP synthesis in cells, without the need for invasive procedures, medication and without any negative side-effects. Low-Level Laser Therapy is actively studied to treat traumatic brain injury, spinal cord injury, acute ischaemic stroke and Parkinson's disease [see reviews *15*; *19*; *20*; *21*]. In application to headaches, Low-Level Laser Therapy has shown promising results for treating tension-type headache [*22*; *23*].

And because the availability of energy in brain cells is of paramount importance for functioning and recovery after injury, the observed beneficial effects of Low-Level Laser Therapy are numerous:

- **Prevention of neuron death in hypoxic conditions, such as after embolic stroke [*13*; *24*];**
- **Rescue of neurons inactivated by toxins [*25*; *26*];**

- **Improvement of memory retention [*27*];**
- **Improvement of cognitive recovery and limiting inflammation after traumatic brain injury [*28*; *29*];**
- **Improvement of major depression and anxiety [*30*];**
- **Improvement of attention, memory and mood [*31*].**

Effect of weak magnetic field on ATP synthesis

As with low-level lasers, experimental data has clearly shown that a weak magnetic field can enhance ATP synthesis. Bolognani *et al.* investigated the effects of low-level lasers and weak magnetic fields and found that both radiances can recover inhibited ATP synthesis [*32*]. Interestingly, the effect of laser light reaches its maximum a few minutes after irradiation is stopped, while the effect of a magnetic field is nearly instantaneous and present only when the magnetic field is switched on.

Therapeutic applications of static and pulsed magnetic fields are very well-known and are practiced worldwide [*33*]. But the nature of the interaction between a weak magnetic field and biology for a very long time remained elusive. In the case of low-level lasers, a respiratory enzyme (cytochrome c oxidase) in mitochondria has been proposed to be responsible for absorbing photons of light and accelerating ATP synthesis [*34*; *35*]. The same enzyme was found to respond to a weak magnetic field [*36*], but still the question remained of how exactly biochemical processes can be modified by a weak magnetic field. At the same time the fact remained that, for example, birds can orient themselves in the geomagnetic field that is about 100,000,000 smaller than the average strength of a chemical bond [*37*].

Schulten *et al.* proposed radical pair mechanism to explain the influence of a magnetic field already in 1978 [*38*]. The theory suggested that a weak magnetic field can induce changes of quantum spin of electrons in interacting molecules with odd numbers of electrons (radicals). But it was only in 2005 that Buchachenko *et al.* experimentally and theoretically showed that a magnetic field can accelerate ATP synthesis (by up to 70%), and confirmed the presence of radical pair mechanism in the interaction of a magnetic field with biology [*39*-*42*].

Near infrared laser and magnetic field in coMra-Therapy

The discovery of Magnetic Infrared Laser Therapy (MIL-Therapy) in Russia in the 1990s showed that the combination of the two radiances has a greater therapeutic effect than when applied separately.

Friedmann *et al.* experimentally demonstrated that a combination of a weak magnetic field and lower intensity light creates a similar effect in cells to when light is applied alone, but at 10 times higher intensity [*43*]. As higher intensity light creates a potential for damage to cells, the combination of the lower intensity radiances opens a way for a wholly safe application, even in cases of longer treatment times. Notably, in the experiment both the weak magnetic field and the lower intensity light did not produce any measurable effects when applied separately, thus suggesting the emergence of synergy.

In coMra-Therapy this synergy between low-level laser and magnetic field is extended further to include two more radiances: colour LEDs and ultrasound.

COLOURS AND EMOTIONS

The bridge between intense negative emotions and symptoms, such as headaches or fatigue lies in how our body registers, processes and responds to emotions. Obviously, the body does not decide by itself to have a headache, because it is just a bit rounder than slim bodies in a fashion magazine. The body interprets emotional colouring generated in the interaction between the perception of the event and the mindset of the person. If the net result will be, for example, the sensation of fear, then one set of physiological responses is launched in order to run for the hills. If it is sensation of joy and peace then very different physiological responses are appropriate, the ones that promotes digestion, resting and healing. In other words, the incredible complexity of mostly subconscious body functioning is fine-tuned to respond to fairly simple commands, delivered in form of emotions such as “all is well and you can rest” or “run for your life!”

The thinking and feeling processes are not the only triggers that can evoke emotions. Notice how often we say that emotions colour our experiences? It is because perception of colour is very similar to the experience

of emotion and has direct impact on the autonomic nervous system that is responsible for the subconscious control of heart rate, digestion, breathing and so on.

The influence of colour on mood and emotional state and consequently on physiology is an experimentally established fact that is employed in various colour light therapies, such as syntonic phototherapy [*44*; *45*]. Very briefly, red and orange colours stimulate the "fight or flight" response via the sympathetic subsystem of the autonomic nervous system. Indigo and blue colours activate the parasympathetic subsystem and promote the "rest and digest" response. Between these two opposites, the yellow-green colour promotes physiological balance. Depending on the disorder and the individual characteristics of the person, a specific choice of colour or sequence of colours is made and applied directly to the eyes, in order to normalise the autonomic nervous system in treating visual dysfunctions, head trauma, headaches, problems with learning and behaviour.

Similar observations of the impact of light on mood lie behind the wide acceptance of light therapy for the treatment of seasonal affective disorder and depression [*46*; *47*].

Colour in coMra-Therapy

The ability of colour to impress an "emotion" on the nervous system opens a possibility of alleviating the destructive effects of intense negative emotions involved in headaches, without interfering with the vast complexity of the neuroendocrine systems. The challenge, however, is that response to colour is specific and depends not only on the wavelength of light (colour), but also on the sequence of colours and the pre-existing state of the nervous system.

coMra-Therapy introduces the novel concept of using three colours in two specific sequences. The sequence of Red -> Indigo-Violet -> Yellow/Green corresponds to a universal impression of the regenerative message. The other sequence is the rejuvenative message and follows the colour sequence Red -> Yellow/Green -> Indigo-violet. In the case of headaches the regenerative message is the most appropriate.

Another novel concept is that in coMra-Therapy the colour messages are delivered not through the visual pathway (eyes), but by direct irradiation of the skin. Photosensitive skin cells, such as pigment producing melanocytes [*48*] and sensory nerves embedded in skin provide a conduit for the modulation of nervous system activity. Direct optical modulation of neural activity is currently being investigated actively as a non-invasive alternative to pharmacological or electrical stimulation [*49*; *50*].

ULTRASOUND

For the sake of completeness, there is one more radiance in coMra-Therapy: ultrasound. Its main role is to accelerate the processes of restoring damaged cellular macro-structures and tissues. In the treatment of headaches ultrasound, however, has a limited role, because of the mostly bioenergetic nature of the disease and the need to avoid introducing unnecessary mechanical vibration into synaptic connections. Ultrasound power levels are too low to introduce any damage, but as a precaution it is recommended to switch it off when it is used over the scalp.

APPLICATION OF COMRA-THERAPY FOR HEADACHES

The coherent combination and the emergent synergy between the different radiances used in coMra-Therapy opens a completely new way of treating headaches. Due to the low intensities of the radiances the treatment is safe, non-invasive and can easily be self-administered.

The basic protocol is simple and involves direct transcranial irradiation of the brain and of the carotid arteries with the Delta Laser (Universal 1 in Delta Laser User Guide).

If the condition does not respond to treatment or in the case of very severe headaches, the following additions can be considered:

• **Universal 3 Blood irradiation** – Blood irradiation with low-level laser has been shown to increase oxygenation of downstream tissue and systemic blood irradiation may help address not only cerebral but

system-wide bioenergetic deficit [*51*; *52*].

- **Universal 5 Nervous system** – As migraine and tension-type headaches are tightly interwoven with neuroendocrine system functioning, this treatment should be added whenever there are signs of acute disorders such as depression, anxiety, fear or emotional exhaustion.
- **Cardiology 3** – When cervical migraine, hypertension or eye pain are present additional neck/shoulder points are strongly recommended.
- **Acupuncture, reflexology, chakras** – Additional treatment points according to the specialised knowledge of the therapist and condition of the patient can be added using the Medical, Probe and Meridian terminals of the Delta Laser.

In combining several treatments note that there is no need to repeat overlapping points in one session.

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