ISSN: 2213-3852
eISSN: 2213-3860

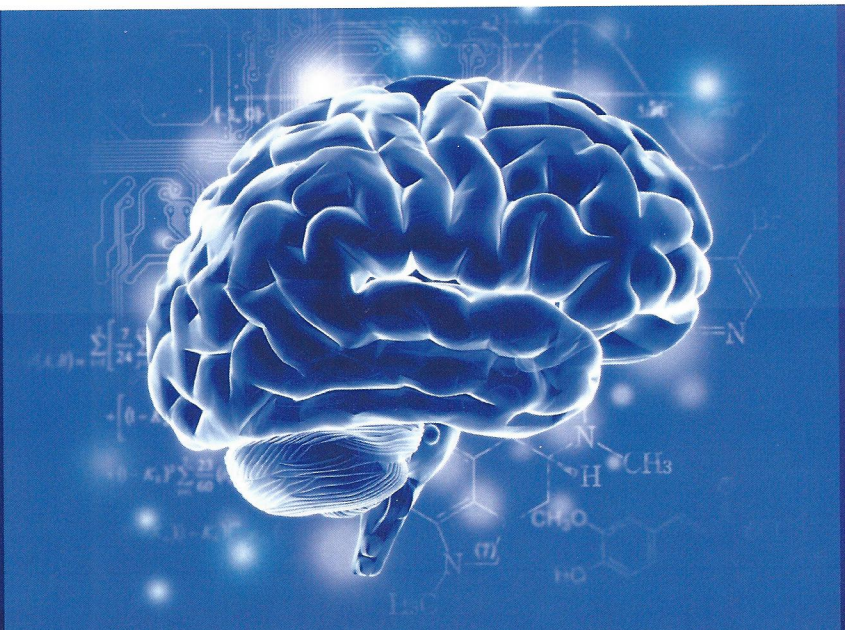
Volume 3, Number 2

Neuroscience and Biomedical Engineering

Getting in Sync: A New Ready-to-use Biofield Resonance Device (Vita Chip) Reduces Chronic Pain and Increases Wellbeing

Rainer Schneider*

RECON, Research and Consulting, Freiburg, Germany



BENTHAM SCIENCE

Send Orders for Reprints to reprints@benthamscience.ae

Neuroscience and Biomedical Engineering, 2015, *3*, 85-93

Getting in Sync: A New Ready-to-use Biofield Resonance Device (Vita Chip) Reduces Chronic Pain and Increases Wellbeing

Rainer Schneider*

RECON, Research and Consulting, Freiburg, Germany

Rainer Schneider

Abstract: *Objectives:* A new information medicine device (Vita Chip) was tested regarding its ability to alter pain dynamics and wellbeing. The Vita Chip is designed to store healing information and to resonate with cells. *Methods:* Two prospective documentation studies were carried out with individuals suffering from various forms of chronic pain. In both studies participants applied two Vita Chips on the pain sites for one hour on each day pain occurred. In study 1, the effects were tested against a natural control condition (crossover design). In study 2, a (pseudo) placebo device was employed in one condition to test for placebo effects. Main dependent variables were pain intensity, onset of pain relief, pain duration, and wellbeing. *Results:* In both studies, the Vita Chips produced large pain reduction effects (Cohen's d). The changes in onset of pain relief, pain duration, and wellbeing indicated high practical relevance. The reduction of pain intensity was not due to placebo effects. Instead, the specific effect outperformed the unspecific effect by more than 150 percent. *Discussion:* The pattern of results suggests that the Vita Chip produces practically relevant pain alleviating effects. It constitutes a safe and effective alternative for pain management in subclinical individuals.

Keywords: Information medicine, mood, pain management, vita chip, well-being.

INTRODUCTION

Within the multifaceted field of complementary medicine, so called biofield, bioresonance, energy or information therapies form a continuously growing domain [1].[1] They are, however, rather heterogeneous with regard to their assumed modes of action. The least common denominator of these therapies is the assumption that interrelated (electromagnetic) fields form the biological basis of life. Starting from this premise, these therapies claim that disturbed living organisms may be externally changed, restored or vitalized.

The scientific study of information medicine may be associated with the pioneering work of the American physician Albert Abrams in the early twentieth century [2]. He observed, inter alia, that patients responded to "vibrating" molecules from removed cancer with muscle contractions. To explain his observations, Abrams postulated a resonance-like correspondence between the earth's magnetic field and that of the human body. His peers, however, taunted him as "dean of quacks of the twentieth century".

Abrams had a number of contemporary colleagues studying similar phenomena. One was the Russian biologist Alexander G. Gurvich who observed that living systems emit ultraweak photons, a phenomenon he dubbed "mitogenetic radiation" [3]. Following-up on this work, the German biophysicist Fritz Albert Popp renewed this line of research in the 1970s. He related Gurvich's observation to the existence of so called biophotons which enable cell communication and cell regulation (for an introduction, see [4]). Largely derided at the time, many of Popp's claims are now confirmed, while others are still speculative. Nonetheless, the existence of biophotons has paved the way for a more holistic and comprehensive understanding of biological cell communication on the grounds of quantum physics.

Another prominent figure and contemporary of Abrams, the Croatian engineer and physicist Nikola Tesla, was granted a patent in 1900 that was based on "transmitting electrical energy through natural mediums" [5]. Although lacking a theory that would explain his findings, Tesla was convinced that high frequent electrical currents had important medical significance. These "Tesla waves", today called scalar waves, have only recently been incorporated in a physical theory by expanding Maxwell's field theory [6]. Scalar waves are a special class of longitudinal waves that can be used to act as a signal carrier between cells and tissues. Ebbers and Meyl [7] have experimentally shown that a resonant scalar wave informed with the biological information of a fungicide (clotrimazole) is able to inhibit the growth of yeast.

Regardless of such findings, academic medicine in general is rather skeptical when it comes to the use and usefulness of information medicine. Among the most prevalent critiques is the notion that neither the purported mode of action (e.g., the transmission of "information signals" to alter the cells' "frequency"), nor the effectiveness of the method

*Address correspondence to this author at the RECON – Research and Consulting, Unterer Mühlenweg 38 B 79114 Freiburg, Germany; Tel/Fax: ++497614766775; E-mail: info@recon-freiburg.biz

[1] Due to the lack of a coherent terminology, I use the terms biofield, energy, bioresonance and information therapy interchangeably.

2213-3852/15 $58.00+.00

has been scientifically conclusively proven (e.g. in meta-analyses). This critique is indeed warranted. A number of hitherto invented contrivances available on the market rather border on wishful thinking at best and sham at worst [8]. Moreover, many positive testimonies are anecdotal in the first place and/or stem from informal feedback. Also, there is both a lack of empirical evidence for the efficacy of information interventions in non-isolated cell systems (i.e. in complex organisms) and of methodologically sound studies involving humans. This is why in studies with humans critics regard positive empirical findings as evidence of placebo effects [9].

Both arguments should be heeded, but the contention of placebo effects as working mechanisms is of special importance. Not only do placebo effects have to be taken into account when gauging the effect of a hitherto not fully understood form of therapy. They also play an important role whenever so called non-specific effects are at work. Placebo effects are large for the treatment of many medical conditions like pain, respiratory diseases, depression, sexual dysfunctions, mood disorders, or gastro-intestinal complaints, to name but a few [10-12]. Expectation, conditioning, needs, and beliefs may act over and above so called specific effects and sometimes even contribute to an equally large or even substantially larger degree to improvement rates [13]. Most importantly, awareness and meaning of an intervention are important psychological factors that trigger and/or mediate treatment effects. But non-specific effects also comprise factors other than psychological ones (i.e. placebo effects). Examples of such non-specific effects are the natural course of the medical condition, measurement effects, circadian rhythms, or regression effects. Basically, they all contribute to the overall treatment effect to varying degrees and thus may bias outcome rates. Naturally, such effects also play an important role for active pharmaceutical (specific) treatments. This is why comparisons with natural controls are important when gauging any therapeutical effect [14].

From this it becomes clear that effectiveness testing of an unorthodox information therapy form needs to meet certain criteria. In the present work, a new biofield resonance device, the Vita Chip (VC), was tested regarding its capability to relieve chronic pain. The VC information technology was developed for the Soviet astronautics to help deal with extensive cosmic radiation. In its actual and commercial form, the VC is contrived to act as a "metaconverter" that stores "healing information". The VC consists of small scale microscopical crystals and minerals that are also found in the human body. The microcristals are alleged to produce single or multiple scalar beams which make the subatomic particles of the cell's ions rotate in a clockwise spin causing a positive vortex polarity (for a more detailed explanation of this general principle refer to [15]). Most importantly, the VC is regarded as being "intelligent" in that it is sensitive to the environmental electrical and electromagnetic field and in that it "translates" the beneficial information stored onto it to the stressed or energy depleted environment (e.g. the human organism). Although the VC can work as a stand-alone product, it is conceived to work in conjunction with high frequency electronic devices such as cell phones whose frequencies are used as carrier signals.

The aim of this paper is not to test if these basic principles hold true and if these claims ground on actual verifiable (quantum-)physical principles. Instead this work is grounded on the fact that there is anecdotal evidence from hundreds of users claiming the effectiveness of the VC. Thus, this paper explores the question if such effects can be scientifically corroborated and, hence, if the VC actually works.

To do so, the VC was systematically tested against two types of control under real-life conditions. Since a majority of the users report pain alleviating effects, the two studies tested:

1. the pain relieving qualities of the Vita Chip.
2. its specific effects.
3. which pain related dynamics it mainly targets.

MATERIALS AND METHODS

Study 1

Nine women and eleven men were recruited through newspaper advertisements. Their mean age was 45.8 years (range 26 to 76 years). Participants had to be in generally good health but had to suffer from regularly occurring and/or reoccurring strong pain of any type for at least three months. Also, they had to refrain from using prescription analgesia during participation in the study. On average, participants had suffered from pain for six months. All participants provided written informed consent, and the study was run according to the Ethical Principles for Medical Research Involving Human Subjects (World Medical Association).

Questionnaires

All pain indices were adopted from a series of similar studies investigating pain symptoms [16]. The item format and content was chosen in accordance with commonly used response formats and recommendations in pain research [17, 18].

Pain Intensity

Pain intensity was measured with a 7-point-Likert-Scale with the anchors no pain, very little pain, little pain, moderate pain, strong pain, very strong pain, and unbearable pain. Participants assessed pain intensity at two points in time: Before pain management was started (i.e. at the time of maximum pain) and at the time when pain alleviating effects were noticed. Pain intensity was also assessed regarding time effects (i.e., after one hour, two, four, and eight hours).

Onset of Pain Relieving Effect

The onset of the pain relieving effect was measured with an item assessing the time in minutes until pain noticeably subsided.

Pain Duration

Pain duration was measured with an item assessing the time in minutes pain lasted.

Type of Pain

The type of pain was assessed with an open item which was assessed for descriptive purposes.

Number of Pain Days

The number of pain days was assessed to check whether pain intensity was associated with it.

Mood and Wellbeing Checklist (MWC)

The MWC consists of 20 adjectives describing various affective and emotional states (example: "tense", "relaxed", "invigorated") on a 4-Point-Likert-Scale ("not at all", "hardly", "somewhat", "very much"). Adjectives indicating negative mood and wellbeing are recoded such that a higher MWC score reflected better mood and wellbeing. Cronbach α for the MWV is .80 [19]).

TREATMENT/INTERVENTION

Natural Control

During the control phase participants were asked to simply document their pain and, if possible, to refrain from resorting to any additional specific pain management (e.g., pain killers). The vast majority of participants adhered to this request. Only one individual employed heat treatment.

Vita Chip

During the intervention participants applied two VCs (SwissMedtechSolutions Inc., Winterthur, Switzerland). The chips are very small (15 mm x 15 mm x 1.2 mm) and attachable to any electronic device. They consist of polyvinyl chloride in which highly minced (1-4 μ grams) minerals and metal oxides (e.g., calcite, vanadium, calcium, fluorite, and magnetite) are blended. The VCs were recorded with information from 1300 meridians totalling 200,000 measurement points. It was derived from a standardized set of health related criteria (e.g., sleep patterns, sensory disturbances, muscle diseases, pain, etc.). This information is expected to counteract or balance any deviant cell oscillation in the participants. Several "reprinters" (e.g., magnetic, quantum-optical, acoustic, and radio frequency) are used to record the information onto the Vita Chip (similar to the recording of a CD with information).

Location of the VCs depended on the type of pain. As a general rule, one VC attached to the participant's mobile phone was placed directly on the pain location (e.g., the shoulder) for at least one hour. To secure proper fit, the mobile phone was attached with a band-aid or a Velcro tape. The other VC was placed on a proximal location (in this case on the cervical vertebrae). Participants were free to use the VCs for a longer time if they so desired. The VC was to be used when pain was maximal.

STUDY DESIGN AND PROCEDURE

The study design involved a prospective, randomized, cross-over repeated measurement documentation spanning two weeks. The documentation was split in two halves: one natural control week (no special pain management) and one intervention week (application of two VCs). Participants documented pain and discomfort on each day pain occurred for at least two hours. To account for non-specific effects, e.g. time effects or regression to the mean [19], the order of the type of intervention was alternated. Participants were tested individually. Before starting the documentation, they were invited to RECON and instructed on the use of the VCs. They were assigned to either of the two conditions according to a randomization protocol computed by the software package SPSS 15. Neither the female experimenter nor the participants had knowledge of the exact ingredients or working mechanism of the VC.

DATA ANALYSIS

To assess statistical effects as well as their clinical/practical relevance, and in alignment with meta-analytical practice [20], effect sizes and confidence intervals rather than significance tests were calculated [2]. To do so, mean comparisons were analyzed according to Cohen's d effect size [21]. For the repeated measurements, mean differences were obtained by subtracting baseline values from post treatment values. Furthermore, confidence intervals (95%) were calculated to estimate the boundaries of the effects. Confidence intervals were obtained according to Borenstein, Hedges, Higgins, and Rothstein [22].

RESULTS

Type of Pain

The majority of the participants (80 percent) reported pain associated with discomfort of joints and/or the musculoskeletal system (lower back [n = 4], shoulder [n = 5], finger [n = 2], knee [n = 1], elbow [n = 2], hip [n = 1], neck (n = 1]). The rest (n = 4) reported headache.

Number of Pain Days

The number of pain days varied considerably between participants (2-14 days). However, there were practically no differences between both the intervention groups and the order of the treatment ($d < 0.1$). Most importantly, the absolute number of pain days and pain intensity did not correlated positively ($r = -0.2$). Thus, pain intensity did not appear to be a function of pain days (cf. 23).

Order of Vita Chip Use

There were no cross-over effects for either of the dependent variables ($d \leq 0.2$). Thus, data were aggregated and analyzed for differences between the groups (i.e. control versus intervention; each n = 20).

---

[2] Despite the widespread use of so called null hypothesis significance testing (NHST), methodologists have harshly criticized and protested its use since the 1930s (for a recent and thorough overview, cf. [33, 34]). For instance, many "highly significant" results are only of small practical/clinical importance due to their small effects [35, 36]. Furthermore, any null hypothesis can easily be rejected with a sufficiently large sample and statistical tests can arbitrarily be rendered significant regardless of the relationship investigated [37]. Also, many statistical assumptions associated with NHST are misconceived despite their ritualistic use (cf. e.g., [38-40]). One such fundamental error is the combination of Fisher's evidential statistic (p-value) and Neyman-Pearson's error estimate (α). As pointed out by many methodologists, they are not in any meaningful way associated when stating that $p < .05$ [41-43]. However, this relationship is falsely represented in statistical text books, often uncritically taught in statistical methodology classes and misconceived by many statistical experts and academics [34, 44].

Responding

Data were descriptively inspected to test for overall pain relief during the documentation and responsiveness to the VC treatment. Three participants reported no pain relief during either documentation condition. Two individuals reported persistent pain during the control documentation, and one person reported no changes in pain during the use of the VCs. Three individuals were pain free after using the VCs. One person was completely pain free after the use of the VCs and subsequently reported no pain during the control week. There was no total pain remission during the control documentation.

Pain Intensity

(Table **1**) depicts the mean pain intensity ratings for both conditions. As can be seen, there were large pain relieving effects when participants applied the VCs. Initial pain intensity was reduced from "strong" to "low" upon onset of pain relief (see also Fig. **1**). This effect was large (d = 1.3) and accounted for a reduction of approximately 30 percent. Also, for participants whose pain persisted longer, this effect continued for up to eight hours. In contrast, pain intensity in the control phase was only reduced from "strong" to "medium" (13 percent). This effect was decisively smaller (d = 0.5) and inconsistent due to the negative CI boundaries. Also, pain reduction took twice as long to occur (cf. Fig. **2**). In participants who still reported pain after eight hours, pain reduction returned to the initial pain level and even slightly increased. The difference between both conditions at the onset of pain relief was d = 0.6 (0 < d < 1.2). After eight hours, this effect had tripled (d = 1.8; 0.6 < d < 3.0).

Onset of Pain Relief and Pain Duration

(Fig. **2**) shows the onset of the pain relieving effects as well as total pain duration. There were large differences regarding the time dynamics between the natural control phase and the VC use. In individuals reporting pain relief, pain onset was 65.9 minutes when they applied the VCs. Pain in this condition lasted 173.1 minutes. In the natural control condition, pain onset was twice as long (130.4 minutes) and lasted for 240 minutes (28 percent longer). The difference in pain onset was large (d = 0.8; 0 < d < 1.6). However, the difference for pain duration was small and statistically inconclusive due to the negative CI boundaries (d = 0.4; -0.3 < d < 1.1).

Mood

The differential effects of both experimental conditions are depicted in (Table **2**). A much larger effect in mood improvement was found when participants used the VCs. In fact, when pain was untreated (natural control) mood did not change (d = 0.1). When treated with the VCs, there was an increase of about 15 percent (d = 1.1; 0.4 < d < 1.8). The difference between both effects was large (d = 1.0; 0.4 < d < 1.).

DISCUSSION

The aim of study 1 was to explore the effectiveness of the VC, which was developed to counterbalance dysfunctional biological processes and improve wellbeing. Participants tested two VCs for a period of one week and according to a standardized documentation protocol. The results showed that, after the use of at least one hour, the VCs measurably altered pain dynamics. Participants were not selected for etiology or type of pain. Hence, the sample was rather

Table 1. Mean pain intensity ratings (study 1).

	Vita Chip						Control					
	Time Points †						Time Points					
	0	1	2	3	4	5	0	1	2	3	4	5
Mean *	4.5	3.3	3.6	3.6	3.5	3.3	4.5	3.9	4.4	4.4	4.8	4.8
Standard Deviation	0.7	1.3	0.9	1.0	0.9	0.9	1.2	1.3	1.0	1.1	1.0	1.0
Effect size [a] Confidence Interval	1.3 0.7 < d < 1.9						0.5 -.1 < d < 1.1					
	1.0 0.3 < d < 1.7						0.3 -0.7 < d < 0.6					
	1.4 0.6 < d < 2.4						0					
	1.4 0.5 < d < 2.3						-0.4 0.2 < d < -1.0					
	1.8 0.5 < d < 2.3						-0.4 0.2 < d < -1.0					

* Range: 1-7; Control: No treatment; † 0: Pre-treatment; 1: upon onset of pain relief (Vita Chip: 66 minutes; Control: 173 minutes); 2: after one hour (n = 18); 2: after two hours ($n_{Vita\ Chip}$ = 14; $n_{Control}$ = 15); 3: after four hours (n = 12); 4: after eight hours (n = 8); [a]: note that effect calculations depend on mean pretreatment pain intensity ratings which vary as a function of the sample sizes.

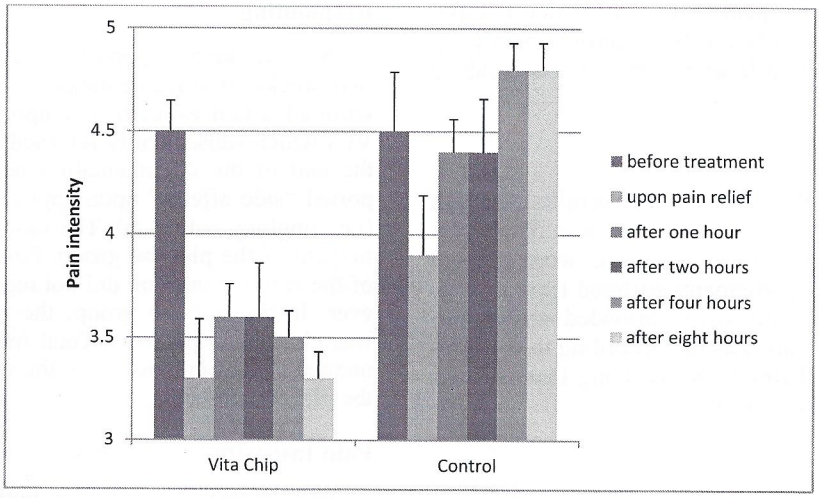


Fig. (1). Mean pain intensity ratings and standard errors in study 1; Control: No treatment; note: sample for post-treatment ratings vary considerably.

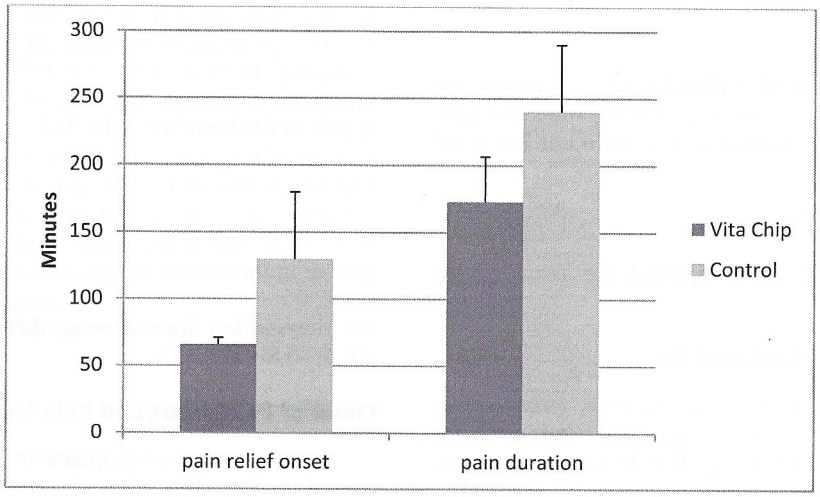


Fig. (2). Differences in onset of pain relief and pain duration in study 1.

Table 2. Mean mood ratings (study 1).

	Vita Chip		Control	
	1	2	1	2
Mean * Standard Deviation	36.7 5.1	42.3 6.2	35.9 5.5	36.3 5.2
Effect size Confidence Interval	1.1 0.4 < d < 1.8		0.1 -0.5 < d < 1.6	

* Range: 14-56; 1: at time of maximum pain; at onset of pain relief.

heterogeneous. Still, there was a marked decrease in pain, an earlier onset of pain relief and clear improvement of mood. This is noteworthy because the participants suffered from pain for six months on average. The reduction of pain duration was statistically small, but practically relevant, because participants' pain was only little after one hour and henceforth didn't bother them too much. Thus, it appears that the application of the device produced consistent effects by reducing pain and enhancing overall wellbeing in individuals suffering from joint and musculoskeletal pain and headache.

In this study, each participant served as their own control. Therefore, pain dynamics was directly comparable and error variances were reduced. Consequently, the external validity of the study was high. Also, comparing an intervention against natural control best reflects the overall effect and hence may be perceived as the most adequate standard of comparison (12; 24). However, one clear limitation of this study was the lack of control for psychological effects. Specifically, the portion of placebo effects was unclear. These could have been triggered and reinforced by high expecta-

tions and a distinct need for pain relief [25], which is especially high in individuals suffering from chronic pain [12]. To investigate the possible role of placebo effects, study 2 was conducted.

Study 2

Seventeen women and 23 men were recruited through newspaper advertisements. Their mean age was 39.6 years (range 18 to 64 years). All inclusion criteria were adopted from study 1. On average, participants suffered from chronic pain for 10 months. All individuals provided written informed consent, and the study was run according to the Ethical Principles for Medical Research Involving Human Subjects (World Medical Association).

Questionnaires

All questionnaires were adopted from study 1.

TREATMENT/INTERVENTION

Control Group

Participants in the (pseudo) placebo control group applied two non-informed VCs. These contained the same substances (i.e., minerals and magnetite) but were not informed with healing frequencies.

Vita Chip

Participants in the VC group applied the same device described in study 1.

STUDY DESIGN AND PROCEDURE

The study design involved a two-armed, prospective, randomized, placebo controlled, repeated measurement documentation spanning one week. The documentation was adopted from study 1. Participants were tested individually. They were pre-instructed and assigned to the experimental condition on their visit to RECON. As in study 1, both participants and experimenter were blind regarding the exact ingredients of the VC. However, both were instructed that the device contained healing information and thus would help alleviate pain.

RESULTS

Type of Pain

The majority of the participants (92.5 percent) reported pain associated with discomfort of joints and/or the musculoskeletal system (lower back [n = 11], shoulder [n = 8], hand/finger [n = 5], knee [n = 1], elbow [n = 4], hip [n = 2], biceps (n = 3]), thigh [n = 1], heel [n = 2]). The rest was headache [n = 2] and abdomen [n = 1].

Number of Pain Days

The number of pain days varied between participants (1-7 days). The number of pain days in the verum group was 3.3 days and 2.9 days in the placebo group ($d < 0.2$). As in study 1, there was no correlation between number of pain days and pain intensity ($r = 0.05$).

Responding

No individual reported aggravation of pain during the two weeks of documentation. Four participants, however, reported initial exacerbation upon the use of the informed VCs which subsequently returned to its initial value towards the end of the documentation period. Two individuals reported "side effects" upon application of the informed VCs (i.e., tingling, cold skin). The same was the case for one participant of the placebo group. Four participants (20 percent) of the verum condition did not report any pain relief whatsoever. In the placebo group, the number of non-responders was eleven (55 percent). Total remission of pain was documented in four individuals in the verum group and in none of the placebo group.

Pain Intensity

Pain intensity decreased in both conditions from the time of maximum pain until the time it noticeably subsided (cf. Table **3** and Fig. **3**). However, there was a considerable difference between both treatments. In the VC group, pain intensity was reduced by about 36 percent, i.e. from "medium to strong" to "low" ($d = 1.4$, $0.7 < d < 2.1$). In the placebo group, the reduction was only 14 percent, i.e. from "medium to low to medium" ($d = 0.8$, $0.2 < d < 1.4$). As in study 1, the pain alleviating effect took twice as long to show (cf. Fig. **4**). The differential effect between the two groups was large ($d = 1.0$; $0.4 < d < 1.6$). In patients who reported that pain lasted more than one hour, mean pain intensity reductions were greater in the verum group compared to the placebo group ($d = 0.8$; $0 < d < 1.6$). For pain lasting two hours and more after the intervention there were no differences between groups ($d \leq 0.5$; $-0.8 < d < 1.2$).

Onset of Pain Relief and Pain Duration

As in study 1, participants in both groups differed with regard to time dynamics of pain relief. Those who applied the VC reported pain relief after 25.5 minutes (SD 15.3). Those using the placebo chip reported relief only after 57.1 minutes (SD 73.8). This difference was medium in size but fell within negative CI boundaries ($d = 0.7$; $-0.1 < d < 1.5$). Likewise, pain in the VC group lasted shorter than in the placebo group (319.9 minutes versus 402 minutes) which corresponded to a reduction of about 20 percent. However, this effect, too, was statistically small $d = 0.3$ and fell within negative boundaries ($-0.6 < d < 1.4$).

Mood

The differential effects of both experimental conditions are depicted in (Table **4**). For both conditions, there was an increase in mood and wellbeing. Unlike in study 1, however, the effect of the VCs was only medium in size ($d = 0.5$). Also, for both conditions, the effects fell within negative CI boundaries.

DISCUSSION

The aim of study 2 was to replicate and extent the findings of study 1 by employing a placebo condition. As in study 1, participants suffering from chronic pain clearly benefited when using the VCs. There was a large effect of pain reduction that was identical to the one found in study 1. Also, there was an earlier onset of pain relief and shorter

Table 3. Mean pain intensity ratings in study 2.

	Vita Chip						Placebo					
	Time Points †						Time Points					
	0	1	2	3	4	5	0	1	2	3	4	5
Mean *	4.4	2.8	3.1	3.5	3.9	4.0	4.2	3.6	3.6	3.6	3.5	3.8
Standard Deviation	0.8	1.4	1.3	1.4	1.6	1.6	0.6	0.9	0.9	0.8	0.9	0.8
Effect size [a] Confidence Interval	1.4 0.7 < d < 2.1						0.8 0.2 < d < 1.4					
	1.2 0.5 < d < 1.9						0.7 0 < d < 1.4					
	0.9 0.1 < d < 1.7						0.9 0.1 < d < 1.7					
	0.5 -0.6 < d < 1.4						0.8 0 < d < 1.6					
	0.3 -0.7 < d < 1.3						0.6 -0.7 < d < 1.3					

* Range: 1-7; † 1: Pre-treatment, 1 = Onset of pain relief (Vita Chip = 26 minutes; Control = 57 minutes); 2: after one hour ($n_{Vita\ Chip}$ = 17; $n_{Placebo}$ = 20); 3: after two hours ($n_{Vita\ Chip}$ = 14; $n_{Placebo}$ = 19); 4: after four hours ($n_{Vita\ Chip}$ = 8; $n_{Placebo}$ = 13); [a]: note that effect calculations depend on mean pain intensity ratings which vary as a function of the sample sizes.

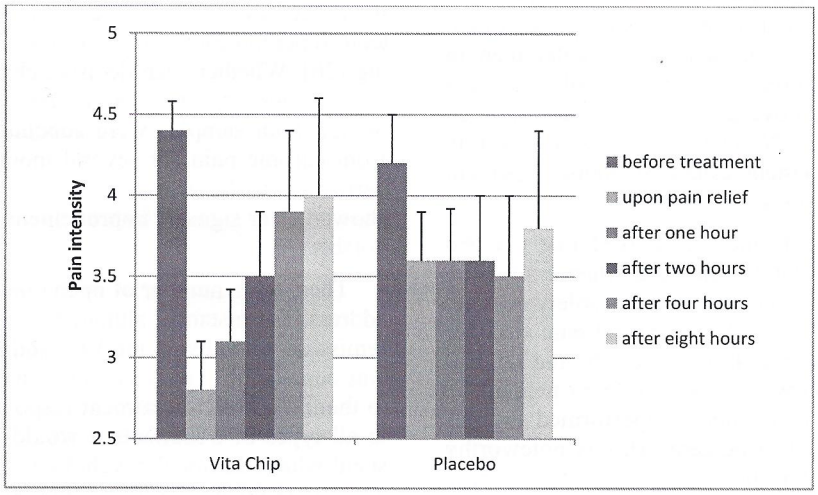


Fig. (3). Mean pain intensity ratings and standard errors in study 2; note: sample for post-treatment ratings vary considerably.

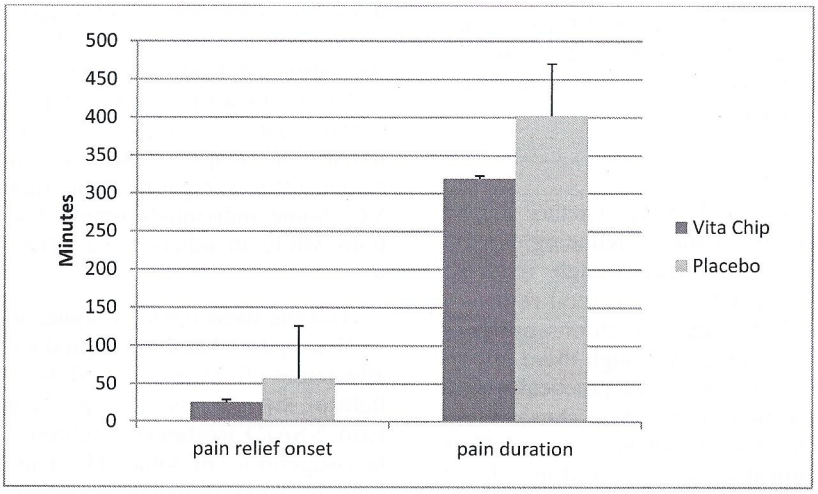


Fig. (4). Differences in onset of pain relief and pain duration in study 2.

Table 4. Mean mood ratings (study 2).

	Vita Chip		Placebo	
	1	2	1	2
Mean * Standard Deviation	41 8.4	44.7 6.7	40 7.3	42.1 5.4
Effect size Confidence Interval	0.5 -0.1 < d < 1.1		0.3 -0.6 < d < 0.9	

* Range: 14-56; 1: at time of maximum pain; at onset of pain relief.

pain duration. However, these effects were statistically smaller and less robust. From a practical point of view, the reduction in pain onset (55 percent) and in pain duration (84 minutes) were nonetheless noteworthy since they indicated that the device appeared to work consistently. The differences between VC and placebo also showed in the rate of responding: The number of participants responding to the device was clearly larger than that responding to placebo (80 percent versus 45 percent).

Unlike study 1, however, the effects on mood were less distinct. This could have been due to the fact that participants in study 2 were in a generally better affective state at the beginning of the study and thus obviously were emotionally less affected by their pain (note that the pretreatment pain intensity ratings in both groups were smaller than in study 1). In fact, the mood ratings indicated a rather uplifted affective state in study 2 (above the 7th percentile compared to 6th percentile in study 1). Nonetheless, there was still an incremental mood improvement effect of about 8 percent when participants used the VCs.

The pattern of results of study 2 showed that placebo effects should not be completely ruled out when explaining the effects of the VC. However, they did not solely account for the overall effect. Firstly, the VCs reduced pain stronger than application of the placebo chips. Secondly, the ratio of specific to unspecific effect was 61 percent to 39 percent. In other words, the specific component outperformed the unspecific one by more than 150 percent. This is noteworthy since studies have shown that the percentage of the specific effect of painkillers may be reduced to 25 percent when the placebo effect is accounted for [10]. Thirdly, the main pain relieving effect occurred during the time the VCs were applied (i.e. one hour) which indicated that the actual use and the close proximity of the device to the pain location is a prerequisite for the effect to occur.

CONCLUSION

The aim of this work was to explore whether a new bioresonance device, the VC, is capable of reducing chronic pain. In both studies, pain intensity was strongly reduced. These effects were neither ascribable to the natural course of pain nor to placebo effects. Furthermore, both onset of pain relief and pain duration were altered. Although these effects were statistically less stable they indicated practically usefulness effects since the total time of pain was considerably shortened. Depending on the intensity of pain, users of the VC also benefited psychologically which showed in uplifted mood and well-being.

The aim of this work was not to determine how the VC works but if it works. Against this backdrop, the effects reflect high effectiveness. This is noteworthy because in general chronic pain is difficult to treat, especially when relatively mild pain treatments are used [26]. Research on chronic pain has found extensive alterations in the neurologic pain matrix [27] with both activity and connections of important pain processing brain regions permanently being changed. These changes, in turn, may increase anxiety and/or decrease reward learning or dysfunctional coping with pain. In some individuals, chronic pain decreases the threshold for pain signals which may further enhance physiological and psychological reactions associated with discrepant bodily processes [28-30]. Interestingly, these individuals also tend to perceive pain relief or pain reductions as less rewarding [26]. Whether such decisive changes were existent in the two studies reported herein remains open. However, although both samples were subclinical, individuals suffered from chronic pain for several months and were not able to permanently alleviate pain by themselves. The fact that they showed clear signs of improvement when applying the VC is notable.

There are a number of open questions this work could not address. For instance, although some users reported full pain remission when using the VCs and although on average pain was considerably reduced, some individuals did not respond to them. Although treatment responding is a common theme in all types of treatments it would still be helpful to understand what additional psychological or biological factors act as a prerequisite for the pain reducing effect of the VC. Likewise, further research will be needed to address questions regarding long-term effects or additional boundary conditions. For example, in both studies the average pain was strong, but not excessively high. It might very well be that in (clinical) patients suffering from very strong or unbearable pain the response to the VC is minimized. Additionally, there appears to be a wide range of interindividual responsiveness regarding the time dynamics effect of the VC. Some individuals reported almost instant pain reductions while in others these effects take longer and/or are weaker.

Despite these open questions, the pattern of results of this work suggests that the VC produces practically relevant pain alleviating effects when used as a pain management tool. In light of the recently reported dangers associated with long-term NSAID treatment of chronic pain [31] as well as the non-superiority of some OTC painkillers with regard to placebo [32] bioresonance devices like the Vita Chip may in

fact constitute a safe and effective alternative in pain management.

CONFLICT OF INTEREST

The work of Rainer Schneider was supported by Swiss-MedtechSolutions Inc, Winterthur, Switzerland.

ACKNOWLEDGEMENTS

Declared none.

REFERENCES

[1] Schneider R, Walach H. Randomized double-blind pilot study on psychological effects of a treatment with Instrumental Biocommunication. Res Comp Med 2006; 13: 35-40.

[2] Abrams A. New concept in diagnosis and treatment. Physico-Clinical Co, 1922.

[3] Gurvich AG. Mitogenetic radiation. Moscow: Soviet Science, 1945.

[4] Popp FA, Beloussov LV. Integrative biophysics. Dordrecht: Kluwer Academic Publishers, 2003.

[5] Tesla N. System of transmission of electrical energy. Patent No 645, 576 (1900) taken from Collected German and American Patents, 510-521, Edition Tesla MVV Peiting, 2000.

[6] Meyl K. DNA and cell resonance: Magnetic waves enable cell communication. DNA Cell Biol 2012; 31: 422-426.

[7] Ebbers JA, Meyl K. Drug effects in yeast mediated by scalar waves. Med Sci 2014; 8: 58-62.

[8] Wüthrich B. Unproven techniques in allergy diagnosis. J Investig Allergol Clin Immunol 2005, 15: 86-90.

[9] Ernst E. Bioresonance, a study of pseudo-scientific language. Res Comp Med 2004; 11: 171-173.

[10] Benedetti F. Placebo effects. Understanding the mechanisms in health and disease. New York: Oxford University Press, 2009.

[11] German Medical Association. Placebo in der Medizin. Herausgegeben von der Bundesärztekammer auf Empfehlung ihres Wissenschatflichen Beirats (Placebo in medicine. Published by the German Medical Association on the recommendation of its scientific advisoiry board). Köln: Deutscher Ärzte-Verlag, 2011.

[12] Schneider R, Kuhl J. Placebo forte: Ways to maximize unspecific therapy effects. Med Hypotheses 2012; 78: 744-751.

[13] Schneider R. The psychology of the placebo effect: Exploring meaning from a functional account. J Mind Behav 2007; 18: 11-17.

[14] Schneider R. Unspecific effects of caffeine consumption: When does the mind overrule the body? In: Romano F D, Russo P F, eds. Caffeine Consumption and Health. New York: Nova Science Publishers 2012; 123-140.

[15] Bearden TE. Theory of Pulsor® operation. In: Yao G T F, ed. Pulsor®. Miracle of Mycrocrystals. Newport Beach: Gyro industries 1985; 114-176.

[16] Schneider R. From pain to pleasure: A newly developed essential oil inhaler (AromaStick®) alters pain dynamics and increases well-being. Submitted manuscript.

[17] Williamson A, Hoggart B. Pain: a review of three commonly used pain rating scales. J Clin Nurs 2005; 14: 798-804.

[18] Jensen MP, Karoly P, O'Riordan EF, Bland F, Burns RS. The subjective experience of acute pain. An assessment of the utility of 10 indices. Clin J Pain 1989; 5: 153-9.

[19] Schneider R. There is something in the air: Testing the efficacy of a new olfactory stress relief method. Stress & Health 2015; onlinelibrary.wiley.com/doi/10.1002/smi.2636/abstract

[20] Schmidt F, Hunter JE. Eight common but false objections to the discontinuation of significance testing in the analysis of research data. In: Harlow LL, Mulaik SA, Steiger JH, eds, What if there were no significance tests? London, UK 1997.

[21] Cohen J. Statistical power analysis for the behavioral sciences. Hillsdale, NJ: Laurence Erlbaum Associates, 1988.

[22] Borenstein M, Hedges LV, Higgins JPT *et al.* Introduction to meta-analysis. Chichester: John Wiley & Sons, 2009

[23] Flor H. New developments in the understanding and management of persistent pain. Curr Opin Psychiatry 2012; 25: 109-113.

[24] Singer J, Schneider R. Smart scents. A guide for effective aromatherapy. Stuttgart: Ebozon, 2014.

[25] Zubieta J-K, Yau W Y, Scott D J *et al.* Belief or need? Accounting for individual variations in the neurochemistry of the placebo effect. Brain Behav Immun 2006; 20:15-26.

[26] Baliki MN, Geha PY, Fields H *et al.* Predicting value of pain and analgesia: nucleus accumbens response to noxious stimuli changes in the presence of chronic pain. Neuron 2010; 66: 149-160.

[27] Simons LE, Elman I, Borsook D. Psychological processing in chronic pain: A neural systems approach. Neurosci Biobehav Rev 2014; 39: 61-78.

[28] Bendelow GA, Williams S J. Transcending the dualisms: towards a sociology of pain. Soc Health & Illness 2008; 17: 139-165.

[29] Bushnell MC, Ceko M, Low LA. Cognitive and emotional control of pain and its disruption in chronic pain. Nature Rev Neurosci 2013; 14: 502-511.

[30] Campbell CM, Edwards RR. Mind-body interactions in pain: the neurophysiology of anxious and catastrophic pain-related thoughts. Transl Res 2009; 153: 97-101.

[31] Roberts E, Delgado Nunes V, Buckner S *et al.* Paracetamol: not as safe as we thought? A systematic literature review of observational studies. Ann Rheum Dis 2015; 2014-206914.

[32] Williams CM, Maher CG, Latimer J. *et al.* Efficacy of paracetamol for acute low-back pain: a double-blind, randomised controlled trial. Lancet 2014; 384: 1586-1596.

[33] Lambdin C. Significance tests as sorcery: Science is empirical - significance tests are not. Theory Psychol 2012; 22: 67-90.

[34] Branch M. Malignant side effects of null-hypothesis significance testing. Theory Psychol 2014; 24: 256-277.

[35] Ioannidis JPA. Why most published research findings are false. PLoS Med 2005; 2: 0696-0701.

[36] Lykken DT. Statistical significance in psychological research. Psych Bull 1968; 70: 151-159.

[37] Bakan D. The test of significance in psychological research. Psych Bull 1996; 66: 423-437.

[38] Armstrong JS. Statistical significance tests are unnecessary even when properly done and properly interpreted: Reply to commentaries. Int J Forecasting 2007; 23: 335-336.

[39] Thompson B. Statistical significance tests, effect size reporting and the vain pursuit of pseudo-objectivity. Theory Psychol 1999; 9: 191-196.

[40] Hubbard R, Armstrong JS. Why we don't really know what statistical significance means: Implications for educators. JME 2006; 28: 114-120.

[41] Gigerenzer G. Mindless statistics. J Soc Econ 2004; 33: 587-606.

[42] Hubbard R. Alphabet soup: Blurring the distinctions between p's and α's in psychological research. Theory Psychol 2004; 14: 295-327.

[43] Wilkinson L & The Task Force on Statistical Inference. Statistical methods in psychology journals: Guidelines and explanations. Am Psychol 1999; 54: 594-604.

[44] Haller S, Krauss S. Misinterpretations of significance: A problem students share with their teachers? Method Psychol Res 2002; 7: 1-20.

Received: May 15, 2015 **Revised: September 28, 2015** **Accepted: September 29, 2015**