Reduction of EMF-induced Stress by the Harmoni Pendant

Using a Wearable Device to Mitigate the Health Impacts of Electromagnetic Radiation

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Summary:

The health risks from exposure to electromagnetic fields (EMF) are increasingly becoming recognized in public and scientific domains. It is estimated that a growing number of undiagnosed and unexplained illnesses may be attributable to EMF-related causes. In the current clinical trial, a controlled exposure to an EMF-stressor measured a sharp decline in 11 health indices, including heart rate variability (HRV), stress resilience, energy reserves and aging. By activating a Harmoni Pendant, a non-electronic wearable device, there was a significant improvement in 10 out of 11 health indices measured. Following pendant activation, even in the presence of the EMF-stressor, the stress index declined by an average of 48% whereas the regulation of autonomic nervous function increased by 310% on average. The HRV index and total power also increased by 703% and 500%, respectively, on average. Interestingly, Harmoni Pendant appeared to reverse biological aging by an average of 79%. Findings from this study clearly suggest the effectiveness of Harmoni Pendant in attenuating EMF-induced bodily stress and enhancing overall health and wellbeing.

Overview:

As we increasingly surround ourselves with electronic technologies for easy life, better connectivity and work efficiency, we expose ourselves to the unintended effects of electromagnetic radiation in our daily lives [1]. Despite occupational variability and geographical spread of the vulnerable, nearly three billion people worldwide are exposed to EMF every single day [2, 3]. With persistent digital innovations in the past few decades, humans are exposed to and absorbing more

electromagnetic radiation than ever before, as EMFs are now ubiquitous at home, work, and places of leisure.

Chronic exposure to EMF is correlated with various adverse impacts on human health[4]. A number of experimental and pre-clinical studies have made foundational observations on cellular, humoral and genetic alterations induced by EMF [5]. However, gold standard clinical studies establishing a causative or correlative association of EMF with bodily stress are rare. There are at least two major barriers to this effect: a) EMF-related illnesses do not typically present clinical symptoms or, at best, present non-specific symptoms involving multiple organ systems making objective medical assessment difficult, and b) a lack of agreeable biomarkers or indicators of bodily distress making quantitative stress measurement even more challenging. Nevertheless, it has been possible to measure the biochemical alterations of EMF-interferences affecting normal cellular communications (via voltage-gated ion channels) [6, 7]; electron transport chain [8]; free radical metabolism [9-11]; protein aggregation and aberrant deposition [12, 13]; enzyme-substrate interactions [14-16]; gene expression and epigenomic landscape [17]; secretion of hormones [18-20] and neurotransmitters [21, 22]. Moreover, EMF has been implicated in inducing cytotoxicity (cell death) and genotoxicity (DNA methylation and strand breaks) in a number of recent studies [23-28]. Since EMF influences physiologic cellular and subcellular processes, it may present a profound health risk involving multiple organ systems, and affecting both physical and psychological well-being. Of the many potential health implications, EMF exposures have been linked to infertility [29-31], oncogenesis [32, 33], immunologic dysfunction [34, 35], neurodegeneration [36, 37], alterations in brain architecture and neural signal processing [28, 38, 39] and metabolic imbalances [40], and prenatal exposure have been linked to postnatal abnormality [41, 42] and life-long behavioral impacts [43].

EMF exposures have long been known to interfere with the autonomic nervous system, the peripheral neural network that controls performance of internal organs including cardiac regulation, respiration, digestion, vasomotor activity and reflex actions [44, 45]. Heart rate variability (HRV), the variation in time intervals between successive heartbeats, is a reliable measure of autonomic activity [36, 46] and a higher HRV in general is associated with optimal health, resilience and greater cognitive capabilities [47-49] while a decline in HRV, an indicator of autonomic dysfunction, can be used as a predictor of pain, stroke, increased rates of cancer and overall poor health [50-52]. HRV-based evaluations are becoming a mainstay of health surveillance and have been recognized in almost all spectra of medical

specialties and are being adopted in personalized/precision medicine. Apart from the clinical utility in disease prognosis, because of the non-invasive nature and relative ease of testing (performed in minutes), HRV tracking is now being integrated into wearable devices for personalized health monitoring. Since HRV reflects autonomic activity, it is possible to extrapolate the status of various autonomic functions from the HRV measurement. In this context, the HeartScientific advanced HRV analytics developed by Therasage LLC is notable as it has made significant strides in HRV-based assessment that can calculate up to 18 discrete health indices including energy metabolism, aging, stress, the body's biophoton fields and biorhythms, and can provide a platform for objective assessment of physical and psychological stress.

While a number of approaches have been tried to block harmful effects of EMF radiation, many EMF-minimizing or EMF-blocking products' efficacy have not been independently and objectively evaluated. In this cross-sectional clinical study, we measured the efficacy of the Harmoni Pendant, a nonelectronic pendant worn as a necklace, in mitigating EMF-induced bodily stress and boosting the body's resilience and adaptability.

Objectives:

- To understand the nature of stress induced by a short-term exposure to a non-ionizing EMF as evidenced HeartScientific advanced HRV analytics
- To assess the efficacy of activating a Harmoni Pendant in order to mitigate the EMF-induced stress without withdrawal of the stressor
- To develop a panel of health indices for non-invasive assessment of overall health and wellness

Study Methodology:

A multicentered, single-armed and open-label study was conducted at nine (9) healthcare locations across the United States between March 2020 and August 2020. A total of 101 consenting healthy subjects (male and female, >18 years) were enrolled in the study. Prior or current users of the Harmoni Pendant were excluded from this study. Additionally, subjects using any other EMF protection devices were also excluded. The study was designed to measure stress at three (3) time points using HeartScientific advanced HRV technology (schematics of the schedule of events shown in **Fig. 1**). Study data were collected at:

- Baseline (with no source of EMF in the vicinity)
- After introduction of a high EMF source
- After activation of the Harmoni Pendant in presence of the EMF source

Prior to the study, we tested many appliances and found a small portable fan to be a reliable source of consistent and high EMF levels. Cell Phone EMF output proved to be inconsistent and varied between brands.

The absence of EMF was confirmed by Gauss meter reading at baseline, and presence of EMF was confirmed by Gauss meter readings after introduction of the EMF-stressor and after Harmoni Pendant activation. The HRV scans were conducted by placing electrodes on the wrists following the manufacturer's recommended protocol at each of the three timepoints (representative image, **Fig. 2**). Since the study did not involve any invasive testing or procedures, it was deemed a minimal risk study. The HRV scan data was utilized to construct a comparative report by HeartScientific Advanced HRV Software Version 9.7. The subject datasets were anonymized, following which they were analyzed by JMP Pro (15.0.0) and Prism 8 (8.4.3) for statistical comparisons. Principles of intent-to-treat analysis were applied where every piece of collected data was processed without any bias or selection and no enrolled subjects were excluded from the analysis.

The datasets were transformed to measure percent (%) change by the formula:

Percent change following EMF-stress:
*[(EMF Stressed-Baseline)/Baseline]*100*

Percent change following Pendant activation:
*[(Pendant activated-Baseline)/Baseline]*100*

The study parameters were:

- HRV index (marker of stress resilience and behavioral flexibility)
- Vegetative index (measure of autonomic nervous system regulation)
- Total power (energy reserve and mitochondrial power)
- Stress index (energy spent to reach homeostasis)
- Biological age (wear and tear of body)
- Complex state index (measure of overall health)
- Harmonization level (biological rhythms)
- Neurohumoral regulation (stress adaptability and neurohumoral balance)
- Psychoemotional state index (measure of stress handling)

- Power of auras (body's biophoton field)
- Energy balance (steady state of energy flow)

A one-tailed paired T-test was applied to discern significant differences between EMF-stressed and pendant-activated time points. References were prepared by EndNote (X9).

The Heart Scientific Advanced HRV Technology was developed by a team of experts in software development, healthcare and Heart Rate Variability (HRV) technology at Therasage LLC, known as an industry leader in integrated FDA listed medical devices, that harness full spectrum infrared frequencies. In a collaborative effort with Dinamika Research from St Petersburg, Russia, also considered the gold standard in Heart Rate Variability software development ever since 1964, HeartScientific Advanced HRV is the most robust and comprehensive Advanced Heart Rate Variability available today.

The HeartScientific Advanced HRV is a digital bioanalyzer that measures fractal neurodynamics and biorhythms in the body from the electrocardiogram signals. The Advanced HRV device, having a small footprint, is highly portable and does not require a specialized training to operate. It is offered as a hardware-software combo that provides an intuitive user interface and creates easy to interpret infographic reports suitable for use at home and at healthcare clinics in tracking individual's wellbeing on the health continuum.

A 5-min scan for the Time-domain and Frequency-domain HRV measurements was conducted to calculate the HRV-Index (also referred to as HRV-Triangular Index or estimate of overall HRV [58]) and 18 other health indices to assess functional state of a person. This methodology was jointly adopted by the task force of the European Society of Cardiology and the North American Society of Pacing and Electrophysiology in the course of developing standard methods for HRV measurement and identifying relevant areas for future cardiology research.

Results:

The study participants had a median age of 44 years (ranging from 18-73 years). Slightly more than half of the participant group was female (**Table 1**). Median reliability of the study was estimated at 88.5% indicating a high reliability score for the entire survey.

The study found that HRV, a marker of autonomic nervous system resiliency, was remarkably impacted by an exposure, albeit briefly, to an EMF source (**Fig. 3**). On average, the HRV-index declined by 1% or 0.33 points from the baseline after the EMF exposure. Activation of the Harmoni Pendant, on the other hand, was followed by a boost in the HRV-index. Following pendant activation, subjects registered a 700% average increase in their HRV-index that remedied the negative effect of EMF exposure and further improved upon baseline observations (**Table 2**).

The Vegetative index, a quantitative measure of autonomic nervous system regulation, was also impacted by the EMF source. The Harmoni Pendant enhanced the Vegetative index by an average of 310%, signifying an immediate apparent benefit from pendant use (**Fig. 3**, **Table 2**).

The trend of EMF-exposure negatively impacting a health index was also observed in Total power, where pendant activation elevated the body's energy reserve by an average of 533%.

The impact of EMF on bodily stress and aging was evaluated (**Fig. 4**, **Table 2**). A few minutes of EMF exposure raised the Stress index by ~20% from the baseline, indicating a direct influence of EMF on bodily distress. Remarkably, Harmoni Pendant was effective in attenuating this stress, with an average Stress index reduction of 48% even in the presence of the stressor. This is a striking observation since complete removal of all EMF sources may not be feasible in modern life and use of a Harmoni pendant can effectively minimize the effects of EMF-induced stress.

Estimation of Biological age (rather than actual age) is a reflection of accumulated wear and tear over time at the cellular and molecular levels. Average Biological age for EMF-stressed subjects was measured as 43.26 years compared to 42.50 years for the same at baseline. In other words, the brief EMF-exposure in the current study induced aging that made the study participants older by an average of 0.76 years. Upon activating the Harmoni Pendant, Biological age was significantly reduced, by ~80%, indicating an anti-aging benefit from pendant usage.

A marked improvement in the indices of Neurohumoral regulation (stress adaptability through neurohumoral balance), Harmonization level (biological and circadian rhythms) and Complex state index (a measure of overall health) were observed following pendant activation (**Fig. 5**, **Table 2**). These improvements were highly relevant with regard to stress handling ability and overall health, where neurohumoral balance was increased on average by 90%. The neurohumoral system includes the

heart-brain connection, and left and right brain hemisphere communication. The better the connection, the better the brain functions. The neurohumoral system regulates the composition and structure of biochemical substances in the body, ensuring the constancy of the internal environment and adaptation of the body to changing living conditions. It expresses the effectiveness of nervous system function and indicates the body's optimal use of energy and physiological resources.

Biological rhythms, including the circadian rhythm, were improved by 159% on average. This may help to explain why people often report improved sleep following activation of their pendants.

The Complex state index, which indicates overall health improvement,was on average 138% greater than at the EMF-stressed measurement point. Together, these findings strongly suggest achievement of a greater level of stress handling and resiliency and better control of the body's ability to adapt to environmental and internal cycles following Harmoni Pendant activation and use.

The study also measured an average boost of 100% in patients; Psychoemotional state indices, a global measure of brain function and stress handling, following Harmoni Pendant activation (**Fig. 6**, **Table 2**).

Measurement of Auras, or the biophoton field, is an emerging concept in energy medicine. Mitochondria, the powerhouse of the cell, harness energy from chemical sources through a series of electron transport systems to power all cellular activities. The measurement of Auras is a measurement of the biophoton field. Harmoni Pendant activation was followed by an increase in total power of the Aura by 138% on average, compared to EMF-stressed levels, indicating improved energy flow and energy production in the body.

The Energy balance variable as measured by a HeartScientific HRV tool represents the ratio between energy input and energy output. While data from post-pendant activation was not statistically significant, the value for Harmoni Pendant post activation was 72% greater on average than the EMF-stressed levels, indicating more energy production and optimal body function following Harmoni Pendant activation.

The overall response rate to Harmoni Pendant is shown in **Table 3**. Total number of favorable responses (number of subjects who experienced a beneficial effect following pendant activation) was higher than that of no-response or adverse response. Taken together, the results from this panel of 11 health indices, indicate that the activation and use of a Harmoni Pendant was found to reduce stress, increase

the body's stress handling ability and stimulate better health. These results suggest that merely wearing a Harmoni Pendant can provide a meaningful difference in human health in an EMF-polluted environment.

Discussion:

Along with the appreciated benefits of electronic and telecommunication innovations that have taken place over the last several decades, health risks related to associated EMFs have been recognized worldwide [53, 54]. The intensity and diversity of man-made EMFs are definitely on the rise, and they have been referred to as another type of pollution [55]. Even though the health impacts of chronic EMF exposure can vary, from poor sleep and fatigue to cellular dysfunction, the harmful effects of EMFs are not generally understood by the public. Slow onset and a higher biological threshold for discernible disease, coupled with a lack of agreed upon biomarkers for early detection of EMF-induced stress are obvious contributing factors. Interventions to block or mitigate EMF-induced stress are limited and are not backed by objective assessments in clinical settings.

The efficacy of the Harmoni Pendant was demonstrated in this study by results from a panel of 11 health indices. These parameters, developed and validated by HeartScientific Advanced HRV technology, provide a reliable construction of the dimensions of stress precursors. Since EMF-induced distress originates at basic cellular and molecular levels, employing conventional testing methods and markers to detect organ level dysfunction may not lead to discovering the underlying root cause of the issues.

Activation of a Harmoni Pendant significantly reduced 10 out of 11 measures of stress. The pendant additionally improved autonomic regulation, the body's energy reserves and biorhythms, and reversed aging. The research findings particularly illuminate the destructive nature of EMF, showing they cause subclinical stress. The study also shows that there are ways to intervene early and effectively to minimize and/or avoid stress build up caused by EMF exposures.

It is noteworthy that the current study only evaluated the biological effects of EMF on the human body and Harmoni Pendant usage for a relatively short period of time (5-10 minutes). Longer usage and weekly activation of the Harmoni Pendant may harness greater impact in reducing stress and improving overall health, making further study worthwhile.

Observations with thousands of Harmoni Pendant wearers indicate that it seems to take about 3-4 days for the full benefits of the Harmoni Pendant to unfold. Assessments at the 30 minute mark or even longer-term, present an avenue of potential further study.

Conclusion:

The data show that activation of a Harmoni Pendant may effectively minimize EMF-induced stress and other harmful alterations to the human body induced by EMFs. The findings also illustrate a range of health benefits achieved from an optimal regulation of the body's steady state machinery. The results strongly support inclusion of the Harmoni Pendant, worn as a necklace, for building an effective personal shield against omnipresent EMFs, to reduce bodily stress and improve overall physical and emotional well-being. This study marks a breakthrough in the first efficacy evaluation and clinical validation of an EMF-protection device available for general use.

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Thanks to Robert Marking for spending years in trial and error working with thousands of clients to create and develop and bring the world the Harmoni Pendant. His intense study of vibrational medicine was a response to years of health challenges that he could not solve through conventional means. These efforts culminated in his insight, discovery and development of the Harmoni Pendant. We are incredibly grateful for his gift to the world.

Our undying gratitude to Robby Besner for the study design, finding the doctors to participate in the study and his coordination and oversight over the doctors and study results. We are also grateful for his research advancing HRV that culminated in his HeartScientific HRV system that was used in this study.

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Note, the doctors and healthcare providers in this study did not receive any financial compensation for their participation in this study.

The study was conducted by the following healthcare practitioners:

Dr. Lisa Koche, MD is triple board certified in Internal Medicine, Bariatrics, and Anti-Aging and Regenerative medicine and a Mitochondrial Specialist, utilizing the best of traditional and integrative medicine to allow patients to achieve optimal health and well being.

Dr. Nathan Bryan PHD is an international leader in nitric oxide research and biochemistry and author of five books. He was the first to describe nitrite and nitrate as indispensable nutrients required for optimal cardiovascular health. He joined the faculty at the University of Texas Health Science Center at Houston under Ferid Murad, M.D., Ph.D., 1998 Nobel Laureate in Medicine or Physiology.

Dr. Lisa Fortin MD is a Harvard trained leader in regenerative functional medicine. She's done training in neurosurgery and radiology and is a published researcher.

Steve Newburn DC, is a functional doctor in practice 25 years who graduated Palmer College of Chiropractic with honors. He employs energy therapies like PEMF, cold lasers, quantum neuro reset therapy, detox and cutting edge testing modalities.

Marlene Siegel DVM is a pioneer in natural alternative veterinary care. She has training in chiropractic, nutrition, Chinese medicine and herbs, acupuncture, Jin Shin jyutsu, intrinsic energy products, therapeutic laser, essential oils, Bach Flowers and certification in Live Blood Analysis.

Dr. Jennifer Gramith, a lymphatic system specialist, holds a doctorate of naturopathic medicine. She is the founder of the Foundation for the Advancement of Energy Medicine Technology (FAEMT), an organization dedicated to research and support of this emerging field.

Michael Rankin Jr, ND, is a specialist in pain management and pioneer in the use of various bioenergetic modalities with his patient population.

Gene Sambataro DDS, is the biohacking biological dentist who believes that nearly 80% of all illnesses are related to infections, toxicities, and imbalances in the mouth.

Tables

Table 1: Participant demographics and study details

Parameters	Value (N=101)
Gender (n)	
Male	44 (44% total)
Female	57 (56% of total)
Median Age (y)	44
Male	42
Female	45
Mean Survey Reliability (%)	87.13

Table 2: Summary of the Responses to Pendant activation

Parameters	% Change[§]
HRV-Index*	**+703.34**
Vegetative Index*	**+310.99**
Total Power*	**+533.90**
Stress Index*	**-48.22**
Biological Age*	**-79.36**
Neurohumoral Regulation*	**+90.66**
Harmonization Level*	**+159.86**
Complex State Index*	**+138.41**
Psychoemotional State*	**+100.61**
Power of Auras*	**+138.41**
Energy Balance	**+72.94**

- following pendant activation compared to that of the EMF-stressed time-point

***** found statistically significant ($p<0.05$)

Table 3: Response rate following Harmoni pendant activation

Parameters	Favorable Response[a]	No Response[b]	Adv
HRV-Index	**45**	**21**	**34**
Vegetative Index	**60**	**10**	**30**
Total Power	**61**	**0**	**39**

Stress Index‡	**62**	**1**	**37**
Biological Age‡	**45**	**21**	**34**
Neurohumoral Regulation	**49**	**8**	**43**
Harmonization Level	**53**	**7**	**40**
Complex State Index	**54**	**6**	**40**
Psychoemotional State	**53**	**5**	**42**
Power of Auras	**54**	**6**	**40**
Energy Balance	**54**	**2**	**44**

[a] post-pendant activated state registered an improvement over that of the EMF-stressed

[b] post-pendant activated state remained the same as that of the EMF-stressed

[c] post-pendant activated state exhibited a deterioration over that of the EMF-stressed

‡ reduction from the EMF-stressed time point was considered as a favorable response

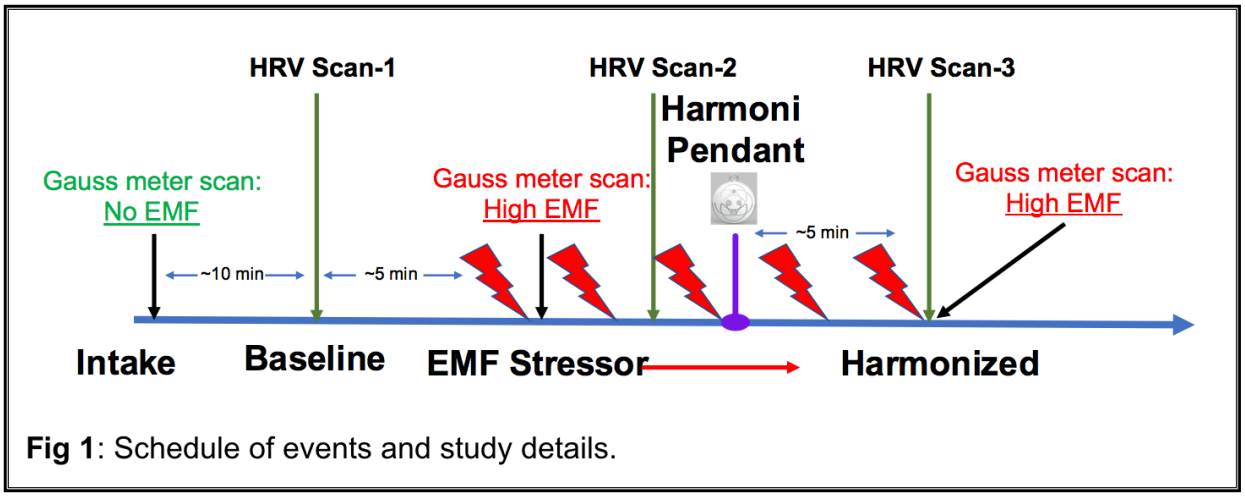

Fig 1: Schedule of events and study details.

Fig 2: A subject being testing for HRV analytics after activatin of Harmoni Pendant.

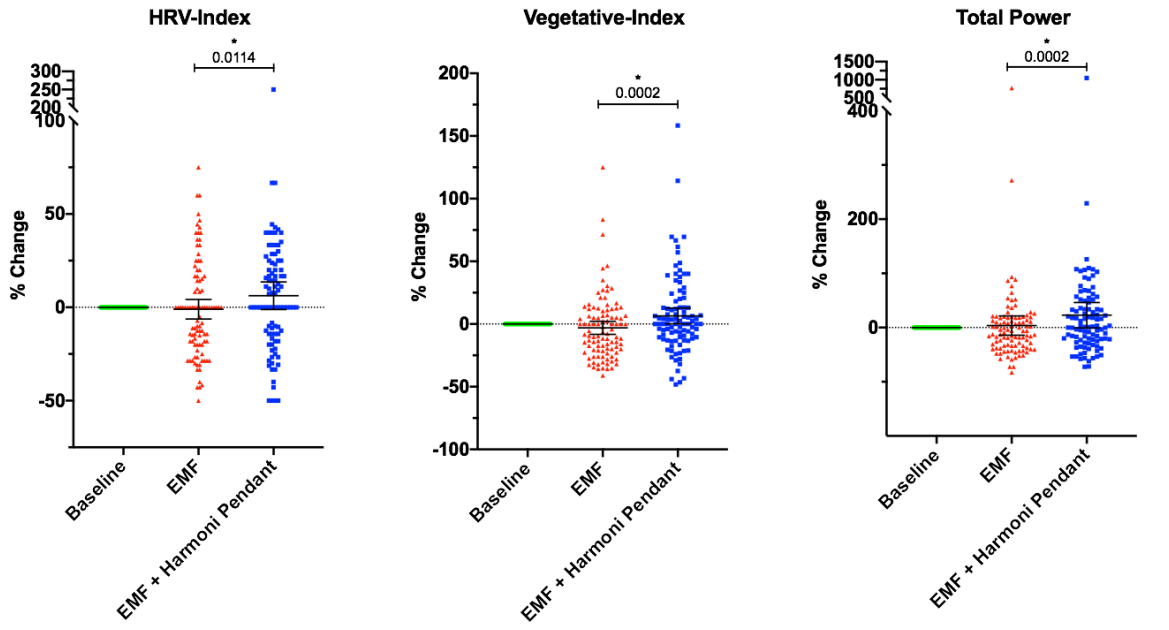

Fig 3: Scatterplot presentation of the HRV-Index, vegetative state and Total power. Percent change in an individual subject (for EMF-stressed and Pendant-activated states) was calculated based on that subject's baseline value. The mean values for each time point are marked (± 95% CI band). Significance (p<0.05) of the difference of means is indicated (*). The pendant activation boosted HRV-index, Vegetative-index and Total power.

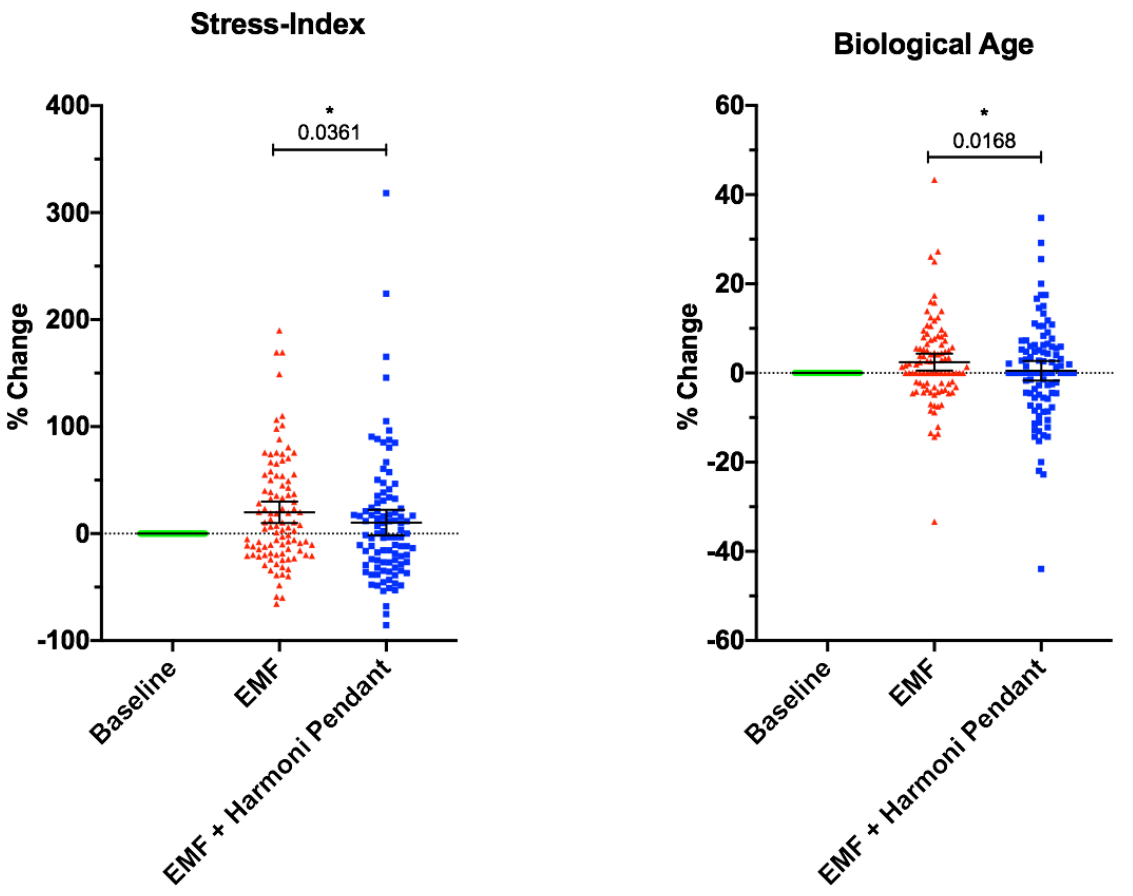

Fig 4: Scatterplot presentation of the Stress-index and Biological-age. Percent change in an individual subject (for EMF-stressed and Pendant-activated states) was calculated based on that subject's baseline value. The mean values for each time point are marked (± 95% CI band). Significance (p<0.05) of the difference of means is indicated (*). A marked decline in Stress-index and aging was observed following the pendant activation.

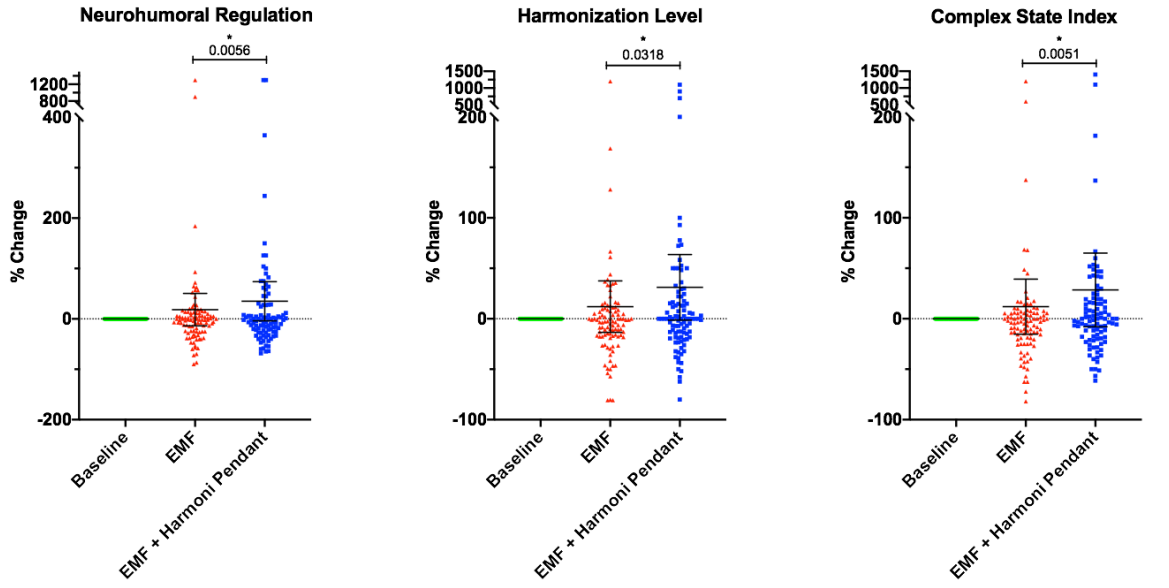

Fig 5: Scatterplot presentation of the Neurohumoral-regulation, level of Harmonization and Complex state index. Percent change in an individual subject (for EMF-stressed and Pendant-activated states) was calculated based on that subject's baseline value. The mean values for each time point are marked (± 95% CI band). Significance (p<0.05) of the difference of means is indicated (*). The pendant activation boosted Neurohumoral regulation, Harmonization level and Complex state index.

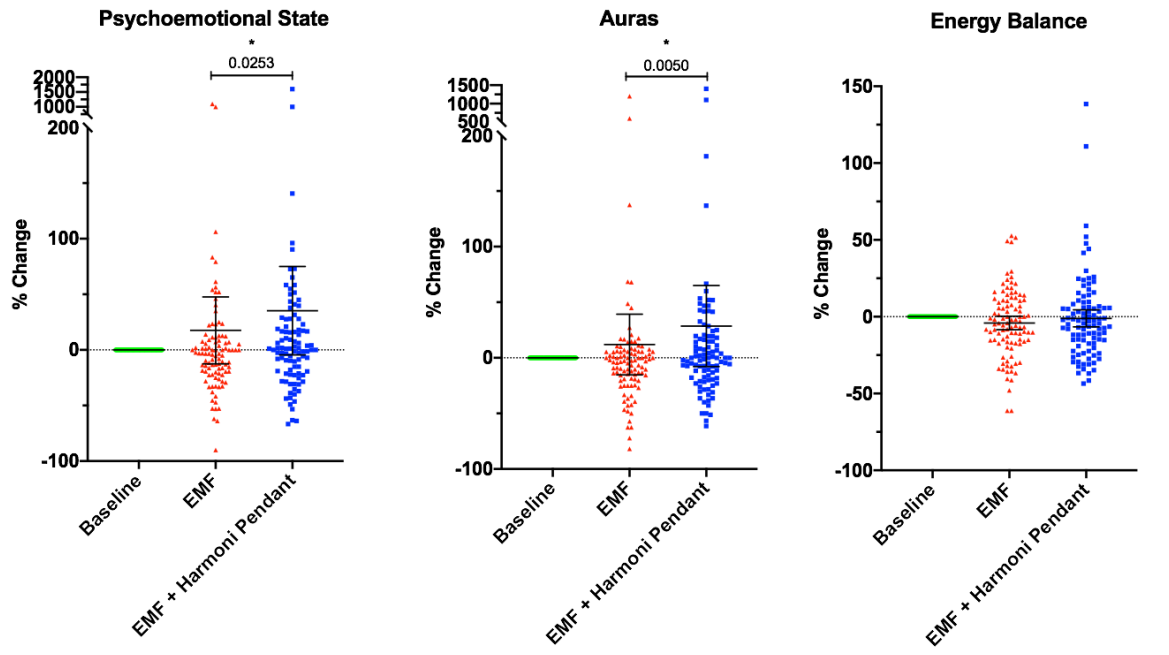

Fig 6: Scatterplot presentation of the Psychoemotional state, power of Auras and Energy balance. Percent change in an individual subject (for EMF-stressed and Pendant-activated states) was calculated based on that subject's baseline value. The mean values for each time point are marked (± 95% CI band). Significance (p<0.05) of the difference of means is indicated (*). The pendant activation elevated Psychoemotional state index, total power of Auras as well as Energy balance.

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