Research Article

Investigation into The Physiological Effects of Nanometer Light Energized Water Study 2: Physical Data

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Abstract

Objective: This study seeks to explore the physiologic results and resulting implications of drinking infused water.

Background: New research has suggested the validity of research in water structure and function. Recent research in the area of photobiomodulation supports changes in water structure based on variations of light [1].

Methods: LifeWave X2O™, beakers, beaker stands, and bottled water. Thought Technology BioGraph Infinity™ Physiology Suite. Vitals included Temp, pulse, respiration, blood pressure and O_2 saturation. Interstitial testing included weight, kCal, BMI, % muscle, % fat, visceral fat and body age. The Sit-Stand test was done to test physicality. And near infrared images were taken before, during and after drinking the water. Two computer questionnaires: Living to 100 and Mental Age. Measures were taken before and after drinking the water within the same 24-hour period. Two groups which were a randomized sample of 10 subjects each were made up of both men and women aged 30-90 with the goal of 10 subjects in each group completing the study. Since this study focused on the impact of energized water, 10 subjects drank bottled distilled water in group 1 and 10 subjects drank the energized version of distilled water. Subjects were consented, then testing was done. Following this participant drank the water while concurrent Near Infrared images were taken, and finally all of the tests were repeated in reverse order.

Results: Significant changes were found in body age and multiple parameters in the physio suite. It is interesting to note that only the on-line questionnaires designed to predict body age failed to produce significance yet still showed a positive change with a reduction in age in the active group.

Conclusion: There is an improvement in wellness measures with a documented trend toward improved body function after drinking the infused water.

Trial Registry

This study was not registered as it was a very small, early, research study.

Introduction

This was a discovery pilot study to determine the immediate physiological effects on individuals consuming water energized by light. The LifeWave X2O™ technology, was used by infusing water using focused light of specific wavelengths.

Background

New research has suggested the validity of research in water structure and function. Recent research in the area of photobiomodulation supports changes in water structure based on variations of light [1]. Water is vital to human life, it is critical to life functions [2], it holds cell walls [3] and DNA together [3], and the body is made of water [2]. Water can also be utilized to improve intake of nanoparticles, using it as a delivery method [4,5]. That has a particularly strong impact with poorly soluble compounds [6-8]. Given the combination of the effect of water directly, the potential ability to modify effects [9-11], and the potential for increased absorption of even poorly soluble compounds energized water has the potential ability to broadly effect health and longevity. In this study we have focused on specific wavelengths of light, and the effects in water on changes in human physiological measurements.

Materials

LifeWave X2O™ technology, beakers, beaker stands, and bottled distilled water. Acupuncture measures include AcuGraph™, Excel II™ and Electro point testing using a data logging multimeter, barometric pressure sensor, and air pressure sensor. Thought Technology BioGraph Infinity™ Physiology Suite including HRV, EEG, EMG, TEMP, Galvanic Skin Response and Blood pressure. Vitals included Temp, pulse, respiration, blood pressure and O_2 saturation. Interstitial testing included weight, kCal, BMI, % muscle, % fat, visceral fat and body age. The Biowell™ provided the Bioelectric-magnetic measures and the Sit-Stand test was done to test physicality. And near infrared images were taken before, during and after drinking the water. Two computer questionnaires: Living to 100 and Mental Age.

Thought Technology BioGraph Infiniti™ Physiology Suit

Complete Thought Technology IS7910 Biograph Infinity™ Physiology Suite testing including EKG, temp, galvanic skin response, blood volume pulse, respiration and EMG measures were taken. CardioPro SA7597 Infinity HRV analysis software was used to analyze measures.

Three 3-minute measures were taken: prior, during and post drinking the energized water. Analysis was done with CardioPro software and measures panel was loaded into spread sheets for additional statistical analysis.

Bio-Well™

Bio-Well ™ 3.0, with 3.0 Bio-Well software.

Near Infrared Photos

FLIR One Pro LT iOS Pro-Grade™ thermal camera for smart phones. High resolution IR images with 1440 by 1080 visual resolution and 80 by 60 thermal resolution accuracy is +/-3C or +/-5% when unit is within 15C to 35C. And scene is within 5C to 120C.

Omron Body Composition and Weight Scale (2021)

Made by Omron Healthcare in 2021, the HBF-514C Body Composition and Weight Scale™ has seven measures available: Body fat %, Body Mass Index, Skeletal Muscle, Resting Metabolism, Visceral fat, Body age, weight. Measures for this study include original weight, body fat and body age.

Vitals

The following vitals measures were taken including Pulse Oximeter, Blood Pressure (Sphygmomanometer Manual Arm Blood Pressure Monitor BP Cuff Gauge tester Machine), temperature and respiration.

Point Measures

The point measures were taken using an AcuGraph™, a Pointer Excel II LT™, a VIVOSUN™ digital indoor thermometer hydrometer calibrated humidity sensor, an EXTECH Instruments MultiLog 720 True RMS™, a CE Digital™ manometer LCD display dual port air pressure gas gauge meter and a VIVOSUN™ digital indoor thermometer hydrometer humidity senser.

Questionnaires

The Living to 100 Life Expectancy Calculator [12] and Mental Age Test [13].

Method

Human Studies Research Ethics review was provided by NAOEP/IJHC approval 08-03-23-8. A randomized controlled single-blind sample of 20 individuals, men and women age 30-81 were recruited, consented and baseline information taken prior to study scheduled date. On scheduled date, participants were on-site for approximately 2 hours. Defined measures were taken and then while attached to HRV system participants drank 16 oz of one of two versions of water treated by the LifeWave X2O™. Base water product used was commercial distilled water lightly chilled prior

to device treatment. Water was treated using the device protocol defined by the developers. Bottled distilled water was placed in beakers on a stand with light panels projecting into the water for approximately 45 minutes. The water was removed and poured into a solo cup immediately prior to the participant drinking the water. It was not allowed to sit between. Group one had the infused water and group two had the untreated distilled water. The untreated water was poured into the solo cups immediately before being handed to the research participant. Duplicate measures were then taken.

Protocol Sequence

When individuals decided to participate in the study they were scheduled to come to the lab at a specific time. At the time scheduled individuals arrived, were given the paperwork, and once it was signed both by the participant and a study team member they were asked to complete the Mental Age and Living to 100 questionnaires, which were taken online. Demographic measures were also taken. Once the questionnaires were completed weight with interstitial age was taken. This was done using the Omron Healthcare in 2021, the HBF-514C Body Composition and Weight Scale™ has seven measures available: Body fat %, Body Mass Index, Skeletal Muscle, Resting Metabolism, Visceral fat, Body age, weight. Measures for this study included original weight, body fat and body age. Once the weight with interstitial age was completed vitals, including blood pressure, temperature, and o2 saturation were taken. Once the vitals were completed a sit/stand test was done, where participants were asked to sit and then stand repeatedly as often as they could within a 2-minute period. The number was counted and then written down on the results sheet.

After the sit/stand test was completed Bioelectric point measures were completed on acupuncture points using multiple test devices. One of these devises was a Data Logging Multimeter/VoltMeter, modelML720™, which was manufactured by Extech Instruments. The AC bandwidth is from 40Hz to 20kHz. The AC accuracy is+/-0.5% and DC accuracy is+/ .08%. The sampling rate was 0.05seconds(50msec). As part of this measure over all temp and barometric pressure of the ambient environment were also taken,

as was the air pressure against the skin so that the same measure of pressure would be used at every data point. An AcuGraph™, and a Pointer Excel II LT™ were the other two devices used. A Biowell measure was also done. At this point participants were wired to the physiology suite, Complete Thought Technology IS7910 Biograph Infinity™ Physiology Suite testing including ekg, temp, galvanic skin response, blood volume pulse, respiration and emg measures. An initial 3-minute round of data was taken before they were asked to drink the water while the physiology suite took another 3-minute round of data and their infrared image was taken 4 times at intervals during that 3-minute round. Following this all of the measures were repeated in reverse order.

Statistical Analysis

All outcome parameters were summarized using means and standard deviations or in terms of medians for non-normally distributed data. Changes from pre- to post-test assessment within each group were evaluate using a paired t-test while changes between groups were evaluated using a two-sample t-test. Non-normally distributed outcomes were analyzed using a nonparametric Wilcoxon Signed rank test for evaluating changes from pre- to post assessments within arms and a Wilcoxon Rank sum test for comparing changes between arms. All reported p-values are two-sided and P<0.05 was used to define statistical significance. Analysis were conducted using the intent-to-treat population.

Results

Demographics

The age range for this study was 35-83, with the average age being 63. The population was ¼ men and the rest were women.

Physiology Suite

Thought Technology BioGraph Infinity™ Physiology Suite measures included HRV, EEG, EMG, Temp, Galvanic Skin Response and Blood Volume Pulse. Areas of statistical relevance were in EKG, EMG, Skin Conductance, and Respiration (Tables 1 and Table 2).

Table 1: Descriptive summary and analysis of difference between Pre/Post Drinking vs. During Drinking Water for HRV outcomes Area, Average, and Mode in the Control group.

Source	Epoch	Parameter	Baseline Median	Post-Test Median	Change from Baseline Median	Change from Baseline p-value (Change from baseline within Arm)
A: EKG	1	HF	1286.8	81.0	-1262.9	0.049
A: EKG	1	Power (ms2/Hz)	8364.0	850.7	-4158.3	0.049
A: EKG	2	NN50	10.5	3.5	-7.0	0.039
A: EKG	2	PNN50	0.2	0.0	-0.1	0.020
A: EKG	3	SDNN (ms)	168.4	37.4	-117.1	0.039
A: EKG	3	NN50	9.5	0.5	-5.0	0.016
A: EKG	3	PNN50	0.1	0.0	-0.1	0.016
A: EKG	3	RMSSD (ms)	229.5	25.5	-142.2	0.008
A: EKG	3	LF	989.4	161.8	-587.9	0.039
A: EKG	3	HF	1388.9	36.3	-694.8	0.023
A: EKG	3	Power (ms2/Hz)	2737.6	403.9	-1297.2	0.016
C: EMG	1	Mode	2.0	3.5	1.3	0.039
C: EMG	2	Area	153.2	286.5	83.0	0.004
C: EMG	2	Average	2.6	4.8	1.4	0.004
EKG HR	1	Mode	69.5	76.0	8.9	0.010
EKG HR Max-Min	1	Mode	1.5	3.7	1.3	0.064
EKG HR Max-Min	3	Average	27.1	4.1	-15.2	0.016
E: Skin Cond	2	Area	34.0	33.6	3.0	0.037
E: Skin Cond	2	Average	0.6	0.6	0.1	0.037
E: Skin Cond	3	Area	27.3	33.7	6.4	0.016
E: Skin Cond	3	Average	0.5	0.6	0.1	0.016
E: Skin Cond	3	Mode	0.5	0.6	0.1	0.023
Resp.Rate	1	Average	14.7	12.6	-1.4	0.020
Resp.Rate	2	Average	15.8	13.4	-1.8	0.037

Table 2: *Descriptive summary and between group change P-value*

Source	Epoch	Parameter	Baseline Median	Post-Test Median	Change from Baseline Median	Change from Baseline p-value (Comparisons change from baseline between Arms)

A: EKG	2	NN50	2.0	4.0	1.0	0.041
A: EKG	2	PNN50	0.0	0.1	0.0	0.055
A: EKG	3	SDNN (ms)	30.0	43.7	4.1	0.024
A: EKG	3	NN50	0.0	4.0	1.0	0.002
A: EKG	3	PNN50	0.0	0.0	0.0	0.002
A: EKG	3	RMSSD (ms)	19.3	32.2	3.2	0.005
A: EKG	3	LF	80.7	205.5	47.2	0.018
A: EKG	3	HF	72.2	73.5	0.7	0.043
A: EKG	3	Power (ms2/Hz)	158.2	342.6	92.3	0.032
C: EMG	2	Mode	2.4	3.5	-1.2	0.030
E: Skin Cond	3	Area	59.1	41.7	-2.7	0.018
E: Skin Cond	3	Average	1.0	0.7	0.0	0.018
E: Skin Cond	3	Mode	1.0	0.7	0.0	0.013
EKG HR Max-Min	3	Average	6.7	6.5	0.8	0.007
Resp.Rate	2	Average	13.6	14.2	-0.1	0.045

The following parameters were included: weight, kCal, BMI, % muscle, % fat, visceral fat and body age. Interstitial Body Age dropped significantly within the active group, at p=0.052 (Table 3). This finding supports the potential for increased longevity. There were no other significant changes.

Table 3: Evaluation of changes in interstitial resistance from baseline to post

			Baseline	Post-Test	Change from Baseline	
Name	**Parameter**	**Arm**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**p-value (Change from baseline within Arm)**
Interstitial	Body Age	Active	55.2 (15.6)	55.7 (15.5)	0.5 (0.7)	0.052
Interstitial	Body Age	Control	62.5 (13.1)	62.8 (13.2)	0.3 (0.8)	0.279

Discussion

The data to this point has been very encouraging on this device. Both in the first study and the second, we see positive changes in function of the major body systems. Improvement in the interstitial data on age was a confirming measure showing a potential for improved longevity. It is, however, very interesting that the between group significance in the HRV data is due to a decrease in the Control group, while the Active group did not change. This study had a small sample size and very short intervention period. Replication studies with both a larger sample size and longer intervention and data taking period should be done.

Conclusion

There is an improvement in wellness measures with a documented trend toward improved body function. Positive changes in organ function are clearly demonstrated in every major body system including brain, heart, kidneys, liver, gallbladder, pancreas, stomach, intestinal track and bladder/pelvic area. It is interesting to note that the sit-stand physical test and the on-line questionnaires designed to predict body age failed to produce significance yet still showed a positive change with a reduction in age in the active group. Double-blind testing of the device is a logical next step in device development to confirm the current test results.

Statements and Declarations

Ethical Considerations

Human Studies Research Ethics review was provided by NAOEP/IJHC approval 08-03-23-8.

Consent to Participate

All participants signed written informed consent documents.

Declaration of Conflicting Interest

This study was funded using a grant from the LifeWave Corporation. The authors have no other financial or non-financial conflicts of interest.

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Data Availability

This data is not being shared in a repository due to concerns about confidentiality.

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