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Investigation into the Physiological Effects of Nanometer Light Energized Water Study I

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ABSTRACT

Introduction: This was a discovery study to determine the base physiological effects on individuals consuming water energized by light. The LifeWave Water Device I was used, which energizes water using focused light of specific wavelengths.

Materials: LifeWave Water Device I, distilled water, plastic cups. VarioCAM® HD head 880 / 30 mm near infrared imaging camera and software, laptop and associated cables and stands. Thought Technology BioGraph Infiniti Physiology Suite including HRV analysis modules, leads, pads, and gel. Data Logging multi-meter, AP-Meter (air pressure meter), barometric pressure gage, ambient temperature gage, blood pressure cuff, iHealth non-contact thermometer, pulse-oxygen meter, Omron Body Composition Monitor and Scale (2021). OMAX darkfield/brightfield microscope with video system software, lancets, band aids, cotton balls, alcohol wipes, lens paper, lens wipes, slides, cover-slips. Urine samples for amino acid testing, test tubes, urine cups, -20C freezer, racking. Questionnaires, computers, printer, pens, clipboards and paper. Shipping supplies including Uline triple walled freezer boxes, deluxe liners, medical grade styrofoam freezer containers, dry ice and shipping tape.

Method: A randomized controlled sample of 20 individuals, men and women age 21-81 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 8 oz of one of two versions of water treated by the LifeWave Water Device Version I. Base water product used was commercial distilled water lightly chilled prior to device treatment. Water was treated for approximately 45 minutes. Group one had no additives to the water and group two added a magnesium based commercial detoxification product. Duplicate measures were then taken. Questionnaires were given at baseline and post physiological testing.

Results: There was significance in participant response from this product across several different areas of interest. These areas included amino acid panel, HRV, bioelectric measures and changes in red blood cell response.

Conclusion: The changes produced by the energized water support further exploration and potential further development of this device.

Keywords: Water, light, energy, amino acid, physiology suite, HRV, near infrared, data-logging multimeter, darkfield microscopy, body composition.

Introduction:

This was a prospective pre-pilot discovery study to determine the immediate physiological effects on individuals consuming water energized by light. The LifeWave Water Device I was used, which energizes water using focused light of specific wavelengths.

Recent research has demonstrated the validity of exploration in water structure and function. New research in the area of photobiomodulation supports changes in water structure based on variations of light[1]. Water is vital to human life, the body is made of water[2], it holds cell walls[3] and DNA together[3], and it is critical to life functions[2]. It can also be utilized as a delivery method for nanoparticles, which may improve intake[4, 5]. This is particularly important with poorly soluble compounds[6, 7, 8]. Given the combination of effect of water directly, the potential ability to modify those[9, 10, 11], and the 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 Water Device I, distilled water, plastic cups. VarioCAM® HD head 880 / 30 mm near infrared imaging camera and software, laptop and associated cables and stands. Thought Technology BioGraph Infiniti Physiology Suite including HRV analysis modules, leads, pads, and gel. Data Logging multi-meter, AP-Meter (air pressure meter), barometric pressure gage, ambient temperature gage, blood pressure cuff, iHealth non-contact thermometer, pulse-oxygen meter, Omron Body Composition Monitor and Scale (2021). OMAX darkfield/brightfield microscope with video system software, lancets, band aids, cotton balls, alcohol wipes, lens paper, lens wipes, slides, cover-slips. Urine samples for amino acid testing, test tubes, urine cups, -20C freezer, racking. Questionnaires, computers, printer, pens, clipboards and paper. Shipping supplies including Uline triple walled freezer boxes, deluxe liners, medical grade styrofoam freezer containers, dry ice and shipping tape.

Thought Technology BioGraph Infiniti Physiology Suite:

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.

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.

Bioelectro-magnetic measures:

The Bioelectro-magnetic measures were taken using 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.

Urine Amino Acid Samples:

The urine amino acid samples were done using sterile urine cups and placed in V-Monovette Urin 4ml Borsaure test tubes, racking to keep the samples vertical, and an American BioTech Supply -20 degree Celsius Medical Freezer.

Method:

A randomized controlled sample of 20 individuals, men and women age 21-81 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 8 oz of one of two versions of water treated by the LifeWave Water Device Version I. 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 no additives to the water and group two added a magnesium based commercial detoxification product. Duplicate measures were then taken. Questionnaires were given at baseline and post physiological testing.

Protocol sequence:

When individuals decided to participate in the study they were scheduled for both an initial consenting time and the main data taking. At the time scheduled for consenting individuals arrived, were given the paperwork, and once it was signed both by the participant and a study team member baseline acupuncture measures, vitals and questionnaire data was taken. On the scheduled day people returned, and at that point a urine sample was taken in sterile urine cups and placed in V-Monovette Urin 4ml Borsaure test tubes. Samples were flash frozen. Once all of the samples were collected they were driven to Carlesbad, CA to guarantee sample viability on a one time basis at the completion of data collection. Amino acid analysis was done on TSQ Quantum Triple Quadrupole LC-MS/MS Mass Spectrometer using amino acid test kit.

Analysis was done at PacifiqueBio laboratory in San Diego which analyzed the urine for amino acids levels. Once the urine test was 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 that was completed an initial near infrared image was taken using VarioCAM® HD head 880 / 30 mm. After that temperature, blood pressure, and O2 saturation were taken. Following that a finger prick blood drop was placed on a slide and viewed under a microscope.

The OMAX 40X-2500X 14MP USB3 Darkfield and Brighfield Trinocular Compound Microscope for Live Blood Analysis model M837Z-A191BOIL-C140U3 with Touptek Photonics ToupView c-mount USB 2.0 CCD camera with Sony ExView HAS.3M-1.4M CCD sensor with ultra-fine color engine video system software with images produced through File Viewer Plus 4 was used for this process. Using sterile lancets, 4 drops of blood were taken at each data point to make 4 microscope wedge slides. Slides were photographed under darkfield microscope while blood was active. Analysis of blood was done looking at blood characteristics such as rouleux and fibrin. Following this acupuncture points were tested using 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. 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 retaken. A final 3-minute round of data from the physiology suite was taken once the prior measure finished or the individual finished drinking, whichever happened last. Following this all of the measures were repeated in reverse order.

Physiological Measures:

Vitals:

The following vitals measures were taken including Pulse Oximeter, Blood Pressure, temperature and respiration.

OMAX Darkfield Microscope with video system software:

The OMAX 40X-2500X 14MP USB3 Darkfield and Brighfield Trinocular Compound Microscope for Live Blood Analysis model M837Z-A191BOIL-C140U3 with Touptek Photonics ToupView c-mount USB 2.0 CCD camera with Sony ExView HAS .3M-1.4M CCD sensor with ultra-fine color engine video system software with images produced through File Viewer Plus 4.

Using sterile lancets, 4 drops of blood were taken at each data point to make 4 microscope slides. Slides were photographed under darkfield microscope while blood was active. Analysis of blood was done looking at blood characteristics such as rouleux and fibrin.

Near Infrared Imaging (Complete specifications in Appendix A):

VarioCAM® HD head 880 / 30 mm
+ Low noise detector for highest sensitivity NETD 20 mK
+ Precision calibrtaion ± 1 K
+ Close up focus for shortest working distance of 100 mm
+ Software package IRBIS®
Options:
+ MicroScan (2048 x 1536) IR-Pixels
+ Close-up lens 0.5x

Two images were taken of each subject before and after drinking the water and analyzed for overall difference in the infrared images.

Thought Technology BioGraph Infiniti Physiology Suite:

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 recorded into spread sheets for additional statistical analysis.

Bioelectric/Acupuncture points:

There have been complaints about the variability of results when taking bioelectric readings of acupuncture points. In order to counter current complaints, three measures were taken for each data point. The first was over all temp and barometric pressure of the ambient environment. The second was the air pressure against the skin so that the same measure of pressure would be used at every data point. The third was the electrical conductance of each acupuncture point as measured with a Data Logging Multimeter/VoltMeter, modelML720, 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). The measurement is passive and there are no known risks to this measurement process.

Amino Acid Panel:

Amino acid analysis of the urine samples was done on TSQ Quantum Triple Quadrupole LC-MS/MS Mass Spectrometer using amino acid test kit. Analysis was done at PacifiqueBio laboratory in San Diego which analyzed the urine for amino acids levels.

Urine samples were taken pre - post water in sterile urine cups consumption and placed in V-Monovette Urin 4ml Borsaure test tubes. Samples were flash frozen and were driven to Carlesbad, CA to guarantee sample viability on a one time basis at the completion of data collection.

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 included original weight, body fat and body age.

Instrument/Questionnaires:

Demographics:
This instrument records basic demographic information such as name, address, birth date and contact information.

Profile of Mood States (POMS):
The POMS is a five-point likert scale. This instrument was used to determine if there are any mood changes as the result of drinking the water.

Arizona Integrative Outcomes Scale - Visual Analogue Scale (AIOS-VAS):
The AIOS-VAS is a 100mm line which shares the state of the participant and their level of vitality.

Global Mood Scale (GMS):
The GMS is a five-point likert scale. This instrument is used as a redundant measure to determine if there are any mood changes as the result of drinking the water.

System Usability Scale (SUS):
The SUS is a five question six-point likert scale. This instrument looks at overall product ease of use.

Single Ease Questionnaire (SEQ):
Originally developed for the computer industry, this is a single question instrument asking for a ranking on the ease of product use.

Marlow-Crowne Social Desirability Scale (MCSDS):
As originally developed, this measure contains 33 true-false items that describe both acceptable but improbable behaviors, as well as those deemed unacceptable but probable. The goal is to determine if responses are politically correct or accurate to what the participant perceives individually.

Statistics:

Statistical Methods: Physiological, acupuncture and questionnaire outcomes were summarized in terms of means and standard deviations, stratified by visit. Mean changes from baseline were calculated and evaluated using a paired t-test. HRV parameters were summarized in terms of medians and interquartile ranges (IQR), stratified by source, epoch and testing period (pre/post vs. during drinking water). Differences of HRV parameters between testing periods were evaluating using a nonparametric Wilcoxon signed rank test. All reported p-values are two-sided. Statistical analyses were conducted using R software (R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria), version 4.3.1.

Results:

Significant results are listed below. Data was gathered at three points. Some data was taken at an initial baseline at consenting. The rest of the data was taken immediately before and after participants drank the water.

Bioelectric Measures/Acupuncture points:
The current theory on the bioelectric results is that the more reactive acupuncture points are where we saw the significant changes. Most of the points that changed significantly were Yang points, and strongly so. We largely did not see a change in the points around digestion, probably because the digestive system often takes over an hour. It would be interesting to test these points over a longer period of time. The between group changes are also interesting, as it is clear that a significant change in Spleen 6 (SP 6) was lost due to the difference in responses between groups. Similarly Stomach 36 (ST 36) and Spleen 6 (Spleen 6) both show statistical significance in the between group numbers, while Gall Bladder 14 (GB 14) and Du 20 both show near significance. This is especially interesting because which group had the stronger change alternates. Group 1 showed more of a change in SP 6 and GB 14, while Group 2 showed more of a change with ST 36 and Du 20.

Table 1: *Descriptive summary and analysis of changes from baseline (visit 1) for acupuncture outcomes*

				Change from Baseline (Visit 1)			
Acupuncture Outcome	**Visit**	**Mean**	**SD**	**Mean**	**SD**	**Effect Size d**	**p-value[1]**
DU14	1	20.2	10.2				
	2	21.3	21.3	1.8	21.4	0.08	0.7121
	3	13.9	7.0	-6.2	11.4	0.54	0.0286
DU20	1	36.3	31.5				
	2	47.8	43.0	8.1	46.7	0.17	0.4591
	3	66.3	70.2	32.4	68.7	0.47	0.0544
LI4	1	15.8	17.8				
	2	24.4	25.7	8.8	34.0	0.26	0.2752
	3	26.1	19.5	10.5	21.7	0.48	0.0496

Questionnaires:

We saw a significant change in Arizona Integrative Outcomes Scale - Visual Analogue Scale (AIOS-VAS) in Group 1, but the lack of change in Group 2 means that there is only near significance when combined. In contrast to this Global Mood Scale (GMS) only show significance when combined, while Profile of Mood States (POMS) shows significance both between groups and in combination, as well as near significance between groups, but neither group shows significance alone. All participants felt the product was easy to use.

Table 2: *Descriptive summary and analysis of changes from baseline (visit 1) for questionnaire outcomes*

				Change from Baseline (Visit 1)			
Questionnaire	**Visit**	**Mean**	**SD**	**Mean**	**SD**	**Effect Size d**	**p-value[1]**
GMS-Sense-well-being[4]	1	2.9	1.1				
	3	3.4	0.8	0.5	0.9	0.56	0.0210
System-Usability	3	89.6	7.5				
Marlow-Crowne-SDC	1	17.8	3.6				

[1]: paired t-test
2: POMS=Profile Mood States Short Form (range 0-148, lower score indicates better outcome)
3: GMS=Global Mood State (range 0-80, higher score indicates better outcome)
4: GMS-Global Mood State- Well-being Item (range 0-10, higher score indicates better outcome)

Thought Technology BioGraph Infiniti Physiology Suite:

A key finding in this study was the significant change in the blood volume pulse and the HRV response epoch 2. In 18 of 20 cases we saw the changes in less than one minute from the start of ingestion of the energized water. The fastest response was within 10 seconds of start of ingestion with the majority within 30-45 seconds. The other two participants showed the change in under two minutes. There was clear improvement in heart rate variability in all participants. This data supports the darkfield microscopy improvement in rouleux. These changes were not different between groups one and two.

Table 3: *Descriptive summary and analysis of difference between Pre/Post Drinking vs. During Drinking Water for EMG outcomes Area, Average, and Mode*

						Difference Pre-Post vs. During Drinking		
Source	**Parameter**	**Epoch**	**Period[1]**	**Median**	**IQR[2]**	**Median**	**IQR[2]**	**p-value[3]**
C:_EMG	Area	1	Pre/Post	232.2	151.64-325.255			
		1	During	369.73	340.99-593.66	163.67	65.09-281.95	0.0003
		2	Pre/Post	200.2	118.525-288.695			
		2	During	196.33	131.23-285.07	8.08	-47.38-101.88	0.5798
		3	Pre/Post	181.79	110.755-256.615			
		3	During	188.62	95.8-259.52	1.19	-55.12-62.3	0.8900
C:_EMG	Average	1	Pre/Post	3.87	2.5275-5.421			
		1	During	6.16	5.683-9.894	2.73	1.085-4.699	0.0003
		2	Pre/Post	3.34	1.9755-4.812			
		2	During	3.27	2.187-4.751	0.13	-0.79-1.698	0.5798
		3	Pre/Post	3.03	1.846-4.277			
		3	During	3.14	1.597-4.325	0.02	-0.919-1.038	0.8900
C:_EMG	Mode	1	Pre/Post	2.47	1.3445-3.48			
		1	During	3.76	1.406-4.822	1.28	0.315-2.224	0.0304
		2	Pre/Post	1.83	1.2605-3.408			
		2	During	2.13	1.254-3.778	0.04	-0.283-1.559	0.4683
		3	Pre/Post	2.23	1.315-2.9405			
		3	During	2.25	1.182-4.005	0.11	-0.581-0.991	0.7819

[1]: Pre/Post Drinking Water vs. During Drinking Water
[2]: IQR: Interquartile-range
[3]:Nonparametric Wilcoxon signed rank test

Table 4: *Descriptive summary and analysis of difference between Pre/Post Drinking vs. During Drinking Water for Skin Conductance outcomes Area, Average, and Mode*

						Difference Pre-Post vs. During Drinking		
Source	**Parameter**	**Epoch**	**Period**[1]	**Median**	**IQR**[2]	**Median**	**IQR**[2]	**p-value**[3]
E:_Skin_Cond	Area	1	Pre/Post	38.71	18.115-65.135			
		1	During	50.13	24.24-95.79	15.45	4.99-35.32	0.0010
		2	Pre/Post	38.36	17.535-64.765			
		2	During	50.98	22.68-94.93	22.6	6.65-41.75	0.0019
		3	Pre/Post	43.17	22.08-76.375			
		3	During	60.36	23.73-94.79	14.46	7.09-27.99	0.0013
E:_Skin_Cond	Average	1	Pre/Post	0.65	0.302-1.086			
		1	During	0.84	0.404-1.597	0.26	0.084-0.588	0.0010
		2	Pre/Post	0.64	0.2925-1.0795			
		2	During	0.85	0.378-1.582	0.38	0.111-0.695	0.0019
		3	Pre/Post	0.72	0.368-1.273			
		3	During	1.01	0.396-1.58	0.24	0.118-0.467	0.0013
E:_Skin_Cond	Mode	1	Pre/Post	0.62	0.305-1.096			
		1	During	0.84	0.407-1.566	0.27	0.089-0.53	0.0013
		2	Pre/Post	0.65	0.2975-1.105			
		2	During	0.81	0.374-1.545	0.31	0.086-0.709	0.0016
		3	Pre/Post	0.71	0.3725-1.178			
		3	During	1.08	0.377-1.549	0.19	0.113-0.445	0.0005

[1]: Pre/Post Drinking Water vs. During Drinking Water
[2]: IQR: Interquartile-range
[3]: Nonparametric Wilcoxon signed rank test

Table 5: *Descriptive summary and analysis of difference between Pre/Post Drinking vs. During Drinking Water for HRV outcomes Area, Average, and Mode*

						Difference Pre-Post vs. During Drinking		
Source	**Parameter**	**Epoch**	**Period**[1]	**Median**	**IQR**[2]	**Median**	**IQR**[2]	**p-value**[3]
EKG_HR	Mode	1	Pre/Post	76.89	67.5855-86.863			
		1	During	86.36	76.947-93.205	9.43	0.347-14.087	0.0013
		2	Pre/Post	78.9	68.1825-88.8475			
		2	During	82.05	69.221-92.033	1.09	-3.178-4.509	0.3692
		3	Pre/Post	80.03	71.0225-89.836			
		3	During	79.86	72.374-93.89	1.09	-1.043-5.709	0.2069
EKG_HR_Max-Min	Mode	1	Pre/Post	2.15	1.3995-3.1585			
		1	During	3.69	2.369-5.931	1.09	0.567-2.972	0.0104
		2	Pre/Post	1.85	1.511-3.1675			
		2	During	3.58	2.709-5.401	1.64	0.73-2.61	0.0019
		3	During	2.7	1.786-4.702	0.03	-0.471-0.824	0.5791
F:_Temp	Area	1	Pre/Post	1922.77	1824.215-2014.645			
		1	During	1963.61	1847.53-2029.57	10.59	-13.59-30.59	0.2462
		2	Pre/Post	1935.67	1849.025-2020.295			
		2	During	1921.49	1821.56-2030.66	-9.4	-39.75-7.33	0.2121
		3	Pre/Post	1961.15	1840.915-2030.63			
		3	During	1932.55	1816.8-2028.49	-30.87	-42.84-3.2	0.0448
F:_Temp	Average	1	Pre/Post	32.05	30.4045-33.5785			
		1	During	32.73	30.793-33.827	0.18	-0.226-0.51	0.2462
		2	Pre/Post	32.26	30.817-33.6715			
		2	During	32.02	30.359-33.844	-0.16	-0.663-0.122	0.2121
		3	Pre/Post	32.69	30.682-33.844			
		3	During	32.21	30.28-33.808	-0.52	-0.714-0.053	0.0448
Resp_Rate	Average	1	Pre/Post	14.36	13.1745-15.8935			
		1	During	13.41	12.055-14.06	-1.59	-3.049--0.071	0.0237
		2	Pre/Post	14.1	12.2815-15.641			

						Difference Pre-Post vs. During Drinking		
Source	**Parameter**	**Epoch**	**Period[1]**	**Median**	**IQR[2]**	**Median**	**IQR[2]**	**p-value[3]**
		2	During	14.06	11.868-14.754	-0.82	-1.683-0.387	0.3038
		3	Pre/Post	14.17	11.6215-15.4595			
		3	During	13.01	11.35-13.703	-0.35	-1.838-0.372	0.3529

[1]: Pre/Post Drinking Water vs. During Drinking Water
[2]: IQR: Interquartile-range
[3]:Nonparametric Wilcoxon signed rank test

Table 6: *Descriptive summary and analysis of changes from baseline (visit 1) for HRV outcomes HF, LF, LF/HF, NN50, PNN50,* Power(ms2/H), RMSSD(ms), SDNN(ms), VLF(ms2/Hz)

						Difference Pre-Post vs. During Drinking		
Source	**Parameter**	**Epoch**	**Period[1]**	**Median**	**IQR[2]**	**Median**	**IQR[2]**	**p-value[3]**
A:EKG	LF/HF	1	Pre/Post	2.72	1.0425-4.4285			
			During	2.99	1.43-4.902	-0.36	-3.12-3.194	0.7987
		2	Pre/Post	2.58	1.2825-4.5715			
			During	5.35	1.19-6.737	2.69	-0.118-4.729	0.0268
		3	Pre/Post	3.38	1.442-5.144			
			During	4.35	1.066-5.54	-0.05	-1.669-3.638	0.6112
A:EKG	RMSSD(ms)	1	Pre/Post	71.74	28.05-305.939			
			During	28.84	16.156-62.358	-22.15	-205.291-4.865	0.0268
		2	Pre/Post	24.22	12.5535-339.096			
			During	19.88	11.974-38.718	-2.12	-134.913-5.496	0.1297
		3	Pre/Post	19.83	14.8815-86.983			
			During	16.93	11.107-51.067	0.87	-6.826-15.781	0.8536

[1]: 1=Pre/Post Drinking Water, 2=During Drinking Water
[2]: IQR: Interquartile-range
[3]:Nonparametric Wilcoxon signed rank test

<u>*Amino Acid Panel:*</u>
There were some interesting trends in the amino acid results. We saw repeated significance and near significance in amino acids related to muscle and brain, both through repair and providing nourishment. In the case of muscles this can be seen in the significant change in Valine[12] and Proline[13], as well as the near significant change in Leucine[14] and 3-Methylhistidine[15]. In the case of the brain this is shown in Sarcosine[16] and Kynurenine[17], as well as near significance with Histidine[18]. This does fit with the recognized improved energy and awareness. It should also be noted that three of the amino acids that changed either significantly or near significantly are essential amino acids. Essential amino acids "are not synthesized by mammals and are therefore is essential or indispensable nutrients"[19].

Table 7: *Evaluation of changes in amino acids from baseline to post*

	Change from Baseline to Post		
Amino Acid	**Median**	**Interquartile Range**	**p-value†**
Sarcosine	-0.26	-0.66--0.1	0.03214*
Valine	1.31	-0.59-4.21	0.04844*
Histidine	33.29	-27.84-127.87	0.08969
β-Alanine	-0.93	-5.62-0.72	0.09151
Leucine	-0.94	-3.94-0.31	0.09731
3-Methylhistidine	-10.30	-29.81--0.77	0.07585
Proline	-0.71	-1.83-0.49	0.04844*
Kynurenine	-0.31	-0.72-0.07	0.04299

†nonparametric Wilcoxon signed rank test
*p<0.05

Secondary Testing with separated groups:
Objective: Comparisons of amino acid levels, physiological outcomes, acupuncture outcomes, and questionnaire outcomes between groups.
Group 1: Subjects 1-10 (N=10) no supplements
Group 2: Subjects 11-20 (N=10) commercial magnesium detox supplement

Table 8: *Comparisons of Amino Acid levels between Group 1 vs. Group 2 at each data point (pre post ingestion of the energized water)*

		Group 1 (N=10)		Group 2 (N=10)		
Amino Acid	**Pre post**	**Mean**	**SD**	**Mean**	**SD**	**p-value†**
Phosphoethanolamine	1	25.2	14.7	13.3	8.0	0.0371
Phosphoethanolamine	2	25.3	13.5	12.5	7.4	0.0174
Carnosine	1	6.0	3.5	8.8	10.5	0.4344
Carnosine	2	4.9	2.3	17.7	20.1	0.0604
Saccharophine	1	3.8	1.9	2.2	0.8	0.0223
Saccharophine	2	4.2	1.8	2.0	0.9	0.0024
Alanine	1	182.2	81.2	225.5	107.3	0.3222
Alanine	2	146.4	63.4	205.6	80.4	0.0840
Histidine	1	264.6	214.4	430.9	209.6	0.0964
Histidine	2	328.6	211.0	470.1	239.6	0.1780
Homocystine	1	0.7	0.8	0.3	0.2	0.0880
Homocystine	2	0.8	0.7	0.2	0.1	0.0177
Tyrosine	1	42.5	25.2	71.8	44.1	0.0848
Tyrosine	2	46.8	16.4	73.2	50.0	0.1295
Adenosylhomocysteine	1	1.5	0.5	1.1	0.3	0.0292
Adenosylhomocysteine	2	1.5	0.5	1.1	0.3	0.0678
Argininosuccinate	1	13.4	5.2	9.3	2.4	0.0340
Argininosuccinate	2	12.3	4.9	9.9	2.6	0.1761

†p-value for comparing Group 1 vs. Group 2

Table 9: *Evaluation of changes in Amino Acid levels from baseline within Groups and comparisons of changes in Amino Acid levels from baseline (1) to post (2) between Group 1 vs. Group 2*

	Group 1 (N=10)			Group (N=10)			
Amino Acid	**M1**	**SD1**	**p-value¹**	**M2**	**SD2**	**p-value¹**	**p-value²**
Carnosine	-1.2	1.8	0.0761	8.8	15.5	0.1051	0.0580
Alloisoleucine	1.2	1.5	0.0299	-0.4	1.4	0.3865	0.0227
Proline	-0.9	1.5	0.0817	-0.5	1.3	0.2390	0.5306
Isoleucine	1.0	1.6	0.0736	-1.3	1.7	0.0405	0.0058

¹p-value for evaluating changes from Visit 1 to Visit 2 within each Group

²p-value for comparing changes from Visit 1 to Visit 2 between Group 1 vs. Group 2

Table 10: *Comparisons of Physiological Outcomes between Group 1 vs. Group 2 at each data point (baseline, pre, post)*

Outcome	**Data point**	**Mean**	**SD**	**Mean**	**SD**	**p-value†**
OxygenSaturation(%)	1	95.9	1.7	97.1	0.6	0.0471
OxygenSaturation(%)	2	96.5	1.6	96.5	1.2	1.0000
OxygenSaturation(%)	3	95.5	1.8	96.7	1.2	0.0982
Pulse(bpm)	1	87.3	13.3	76.2	6.0	0.0280
Pulse(bpm)	2	82.2	13.0	77.4	11.7	0.3963
Pulse(bpm)	3	80.5	11.4	74.1	13.0	0.2571
Diastolic-BP(mmg)	1	76.7	15.2	87.0	20.4	0.2325
Diastolic-BP(mmg)	2	78.4	7.2	86.4	11.0	0.0704
Diastolic-BP(mmg)	3	80.0	8.9	86.4	6.5	0.0841

†p-value for comparing Group 1 vs. Group 2

Table 11: *Comparisons of BioElectric Outcomes between Group 1 vs. Group 2 at each datapoint (baseline(1), during(2), and post(3))*

Outcome	**Data point**	**Mean**	**SD**	**Mean**	**SD**	**p-value†**
GB14	1	16.9	14.7	10.7	6.0	0.2364
GB14	2	12.2	5.5	16.9	14.9	0.3608
GB14	3	21.0	9.9	13.2	7.9	0.0676
DU20	1	30.0	18.8	42.0	40.0	0.4234
DU20	2	59.9	55.3	35.7	22.6	0.2168
DU20	3	39.5	35.5	93.1	86.8	0.0875
SP6	1	24.7	15.2	25.6	14.9	0.8940
SP6	2	11.6	5.7	23.9	14.5	0.0228
SP6	3	15.9	9.5	26.2	28.0	0.2851
ST36	1	21.8	9.7	28.5	17.2	0.3161
ST36	2	16.6	11.7	37.2	25.4	0.0315
ST36	3	20.4	11.7	46.2	43.2	0.0851

†p-value for comparing Group 1 vs. Group 2

Table 12: *Comparisons of Changes in BioElectric Outcomes from baseline (1) to during (2) and post (3) between Group 1 vs. Group 2*

		Group 1 (N=10)				Group 2 (N=10)				
Outcome	Change from baseline to:	Mean	SD	Effect Size d	p-value¹	Mean	SD	Effect Size d	p-value¹	p-value²
DU14	2	0.7	22.0	0.03	0.9297	2.9	22.1	0.13	0.8278	0.6873
DU14	3	-9.1	9.2	0.99	0.0175	-3.6	13.0	0.28	0.3049	0.4030
DU20	2	24.1	56.3	0.43	0.2349	-6.3	32.5	0.19	0.1621	0.5550
DU20	3	11.7	33.2	0.35	0.3224	51.1	87.4	0.58	0.2209	0.0975
SP6	2	-13.9	15.2	0.91	0.0252	-1.7	20.3	0.08	0.1602	0.7970
SP6	3	-8.9	13.2	0.67	0.0776	0.6	27.7	0.02	0.3628	0.9469

¹p-value for evaluating changes from Visit 1 to Visit 2 within each Group
²p-value for comparing changes from Visit 1 to Visit 2 between Group 1 vs. Group 2

Table 13: *Comparisons of Questionnaire Outcomes between Group 1 vs. Group 2 at each data point (pre/post water consumption)*

Outcome	Pre-Post	Mean	SD	Mean	SD	p-value†
POMS	1	0.0	1.4	1.2	1.1	0.0570
POMS	2	-0.4	1.0	0.4	1.0	0.0806
System-Usability	1	87.2	10.3	92.0	0.0	0.1576
Marlow-Crowne-SDC	1	18.3	3.8	17.3	3.5	0.5498

†p-value for comparing Group 1 vs. Group 2

Table 14: *Comparisons of Changes in Questionnaire Outcomes from baseline to post visit*

		Group 1 (N=10)				Group 2 (N=10)				
Outcome	Change from Visit 1 to:	Mean	SD	Effect Size d	p-value¹	Mean	SD	Effect Size d	p-value¹	p-value²
AIOS	2	12.2	12.7	0.96	0.0142	5.0	25.4	0.20	0.5531	0.4316

¹p-value for evaluating changes from Visit 1 to Visit 2 within each Group
²p-value for comparing changes from Visit 1 to Visit 2 between Group 1 vs. Group 2

Discussion:

There was significance in participant response from this product across several different areas of interest. These areas included amino acid panel, HRV, bioelectric measures and changes in red blood cell response. The changes produced by the energized water support additional exploration and potential further development of this device.

OMAX Darkfield Microscope with video system software:
Please see Appendix D for sample images. Changes in the level of rouleux were significant in 6 of the group 1 participants. Less significant but still clear changes in the level of rouleux were seen in 4 of the group 2 participants. All participants had some level of improvement in rouleux. While these changes are clear there is no specific indication yet as to why some participants showed improvement and some did not. Rouleux happens in the blood when the surface proteins on the red blood cells become too sticky. This causes the red blood cells to stick together and produce chains of cells or groupings that are too big to fit into capillaries. The result can be anoxia for the brain and damage over time to hands, feet and organs that have smaller blood vessels.

All participants had a level of rouleux than was higher than expected at baseline. While there is data available that both the mRNA vaccines and 5G networks increase rouleux this data is only now being developed by the scientific community, and there is an incomplete understanding of both processes. However, we did see marked increase in rouleux in all participants over what would be expected in a normal random population. The participants included individuals both vaccinated and non-vaccinated. All participants carried cell phones.

A limited number of white blood cells were seen in the images. There was no increase in white blood cells in the images post ingesting the energized water.

In two of the images foreign body appeared in the samples. This may have been caused by contamination. Other reasons have not been ruled out.

Near Infrared Imaging:
While infrared images were taken pre/post of each participant, the camera involved did not demonstrated sufficient clarity to provide distinguishing data. There were subtle changes but they were not clear enough to provide results.

Omron Body Composition and Weight Scale (2021):
All but two of the participants, both of whom were male (age 35 and age 70), dropped a minimum of two years in age after drinking the energized water. The two participants who did not drop in age both gained one year. Both individuals who gained age came to the study site stated they were dehydrated.

Limitations:

The small sample size, limited amount of time included, and broad coverage of the tests included are all limitations of this study. It would be a good idea to increase the sample size and cover a longer period of time in future research.

Conclusion:

This was a fairly complex randomized prospective pre-pilot study with testing done over a very short period of time. As such, in general significance of any kind in more than one area would be unusual. Despite this there was significance in participant response from this product across several different areas of interest. These areas included amino acid panel, HRV, bioelectric measures and changes in red blood cell response. The changes produced by the energized water support additional exploration and potential further development of this device.

Conflicts of Interest:

Kelly Schmidt was later made the research coordinator for LifeWave.

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