



Research Article

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The Effect of An Aqueous Electricidal Solution on General Well Being

Leonard Sonnenschein^{1*}, Tiberious Etyang², Rutu Shah³, Ruth Frischer⁴ and Glen Rein⁴

¹The Sonnenschein Institute, USA

²eNSPIRE Africa, Kenya

³Case Western Reserve University, USA

⁴International Health Scientist, USA

*Corresponding author: Leonard Sonnenschein, The Sonnenschein Institute, 6617 NW 24th Ave., Boca Raton, FL 33496, (314) 609-2798, USA.

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Abstract

Solution4USA's dietary supplement, referred to here as "ELECTROCIDE™" is a new type of aqueous nutraceutical which is antipathogenic in nature due to pathogen specific electrical charge properties. Thousands of people have been treated with this product when delivered through an existing network of medical professionals validating its efficacy and safety. Using FDA guidelines, "ELECTROCIDE™" was evaluated for wellness benefits as a potential investigational drug under medical supervision using 52 volunteers (Group1: 15 and Group2: 37) in an institutional setting (The Lovelady Center (TLC) in Birmingham, Alabama) using quantitative measurements of vital signs along with two qualitative self-reported questionnaires. The results indicate a highly significant improvement in vital signs and a significant reduction in various physiological and emotional conditions.

At the start of the study, the average temperature and oxygen values were subnormal, indicating poor health status, whereas, by the end of the study, vital signs were all normal. During the study, a cohort study (proof of concept) was conducted with 14 individuals, in the TLC general population, who were identified and diagnosed as COVID-19 positive. After 6 days (on average) of "ELECTROCIDE™" administration, a shift of their COVID-19 status switched to negative, and a complete reversal of symptoms were observed several times faster than predicted by the CDC [1]. Of particular interest were oxygen levels because a previous in-vitro pilot study indicated that dissolved oxygen levels doubled with "ELECTROCIDE™" -It is postulated that this is an important mechanism promoting an immediate sense of wellness.

Keywords: Electrical Charge; Dietary Supplement; Mineral Solution; Oxygen; Electricidal; Wellbeing; Antipathogen; Inflammation; COVID-19; Wellness; Electroicide; Bacterial; Fungi; Viruses

Abbreviations: TLC: The Lovelady Center, EM: Electromagnetic, SB: Small Body, MB: Medium Body, LB: Large Body

Introduction

Electroceuticals are typically bioelectronic signaling devices that deliver electrical energy to the body transcutaneously using electrodes [2]. One can also use patches [3], fabrics [4], biofilms [5], and hydrogels [2] utilizing metallic salts and ions to generate current voltages. Electroceuticals are bactericidal since DC currents as low as 10 micro-amp in combination with electrically generated ions (Ag, Cu, and Zn) have been reported to kill bacterial [6], fungi [7], and viruses [4] in as little as 2 days. Micronized minerals and trace

minerals have been shown to have broad-spectrum anti-pathogenic properties [8,9]. Scanning electron microscope images show pathogens being fragmented by the electrical discharge between the negatively charged pathogens and the positively charged surface of the active minerals [10,11]. It has been proposed that such "iontophoretic killing" of pathogens is mediated by a positive zeta potential generated from a negatively charged RNA envelope inside a positively charged capsid shell [11]. This proposed mechanism of action has recently been demonstrated using an electroceutical

fabric that lowers the coronavirus's zeta potential, resulting in destabilization of its electro-kinetic properties eradicating its infectivity upon contact with the fabric [4].

In addition to having toxic effects on pathogenic microorganisms, bacteria and viruses, electroceuticals have therapeutic effects [12]. They have been shown to increase the bioavailability of dietary supplements [9,13], enhance wound healing [14], have an analgesic action [15], and are used to treat venous leg ulcers [16]. Furthermore, since electroceuticals can target neural electrical circuits and modulate action potentials [17], they can also produce neural-based therapeutic effects. The aqueous electricidal solution used in the current study has another property that could also account for its clinical efficacy-it is hypotonic (Sonnenschein, patent pending). Hypotonic solutions have been used for osmoregulation and extracellular osmotic manipulation resulting in enhanced membrane transport of sodium via activation of Na-K ATPase [18]. This approach has been used to regulate cerebral edema [19], control intraocular pressure in the cornea [20], release glutamate from astrocytes [21], and cause hemolysis in red blood cells [22]. In addition, the aqueous electroceutical used in the current study is also a supersaturated oxygen solution. Hyperoxygenation is used clinically to modulate cognitive function [23], regeneration [24], and pulmonary circulation [25]. In addition, oxygenated water has been used to enhance athletic performance [26], treat diabetics [27], stimulate the immune system [28], accelerate detoxification [29], and increase oxygen availability [30].

Methodology

Recruitment of Participants

Informed consent was obtained through a release form and a medical history form from each participant, to ensure understanding of potential risks and benefits of consuming the product. All subjects, including the COVID-19 individuals, filled out a daily online survey for 3 days prior to "ELECTROCIDE™" administration that served as control measurements. The treatment groups continued to report the beneficial effects 1 hour after administration for 7 days. Throughout the study, every subject's blood was checked daily before and after using the "ELECTROCIDE™." Near the end of the study, any changes experienced from the initial marked conditions were documented as a percentage change from beginning to end, along with any additional comments. According to The Lovelady Center, it was against their policies to include a placebo group. Therefore, the participants in the first 3 days of the study prior to the administration of "ELECTROCIDE™" served as a control group.

The Wellness Study Protocol

A one-ounce bottle of 1 mL of "ELECTROCIDE™" concentrate was added, and the container was filled with tap water to yield 1-ounce net fluid. The bottles were labeled with product information and

a mixing reminder to activate the suspension properly. They were also tagged for each participant to be refilled and reused throughout the study. When necessary, additional blood chemistry or other lab work was undertaken with such data to become part of the study, including COVID-19 Testing.

Participants

There were 15 participants in Group 1 (1-4 days of product administration), while 37 participated in Group 2 (5-7 days of product administration). The average age of Group 1 was 39.2 years and 41.3 years for Group 2. Participants in Group 1 averaged 2.5 out of 3 in body type (SB {Small Body} =1; MB {Medium Body} =2; LB {Large Body} =3) while those in Group 2 averaged 2.2 out of 3 in body type. On average, 64% of Group 1 reported either smoking or vaping, while 76% in Group 2 reported smoking or vaping. Participants in Group 1 used an average of 2.7 doses, while those in Group 2 used an average of 6.0 doses. All personal information was kept confidential.

Statistical Analyses

Data were analyzed using the Student's T-test in a paired and non-paired format based on data using a two-tailed approach, since data can be bi-directional. P values where $p < 0.05^*$ is considered significant, $p < 0.01^{**}$ is considered very significant, and $p < 0.001^{***}$ is considered extremely significant.

COVID-19 Cohort Study

During the general wellness study, 14 individuals in the general population of The Lovelady Center were noted to have tested positive for COVID-19, with associated symptoms. A cohort "proof of principal" study, comprised of these individuals, was added to the wellness study. However, vital signs and other observations were not performed in this group due to limited access to the infirmary where they were quarantined. However, notes regarding symptoms and the disappearance of symptoms were performed, along with daily administration of the "ELECTROCIDE™" solution. During the wellness study, none of the individuals participating in the wellness study at TLC became ill.

Results

Medical History

Initial Annotated Data were compared to last day's data as Percentage Improvement. Each value presented above represents the percent improvement in their symptomology by comparing their initial entry symptoms with their symptoms on day 7. Raw values for each time were determined using 1-10 numerical scale. Group 1 received 1-4 servings total and Group 2 received 5-7 servings total. All control data represents the average subjective evaluations (scale 0-10) for each subject during the 3-day control period. The overall control averages are compared with the average

subjective evaluations 1 hour after taking the product on day 4. For each parameter, the participants were asked to rank their daily health conditions. These conditions were rated 0 to 10. If the parameter was noted to be -, then 0 would be the optimal numerical value, and 10 would be the worst condition. If the parameter were noted to be +, then 0 would be the worst condition, and 10 would be optimal (Table1-2). The data indicate a highly significant change in the symptomology at day 4 when the entire population (Group

1 and Group 2) were evaluated. Only stomachache and diarrhea issues were not significantly changed. The results indicate a statistically significant increase in both body temperature and blood oxygen levels towards the end of the study. At the start of the study, the average temperature and oxygen values were subnormal, indicating their poor health status, whereas, by the end of the study, their vital signs were normal (Table3-4).

Table 1: Effects of "ELECTROCIDETM" on medical history status.

Test Group (Decrease %)	Group 1	Group 2	Test Group (Increase %)	Group 1	Group 2
Stomach Problems	50	100*	Focus	66.7	76.7*
Back pain	30	83.3*	Sleep	100	97.0*
Leg/ knee pain	50	82.2*	Change in Energy	100	96.8*
Numbness/ Arm pain	34	92.3*			
Arthritis	33.1	75.0*			
Heart Problems	30	100*			
Depression /Anxiety	27.5	82.9*			
Asthma	25	84.5*			
Lung/Breathing Problems	14	91.8*			
Headache	0	91.7*			
Neck pain	0	83.3*			

*Indicates data has been shown to be statistically significant to $p < 0.05$ probability

Each value presented above represents the percent improvement in their symptomology by comparing their initial entry symptoms with their symptoms on day 7. Raw values for each time were determined using 1-10 numerical scale. Group 1 received 1-4 servings total and Group 2 received 5-7 servings total.

Table 2: Daily Online Wellness Survey.

Study Parameters	Statistics			
	Mean-All Control (n=219)	Mean-Treat Day 4 (n=32)	t-value	Net change: Treat
Happy and Content	6.7±0.29	8.4±0.49***	-4.282	1.7
Depressed	4.1±0.54	1.6±0.99***	4.847	-2.5
Anxious	5.1±0.61	2.1±1.43***	5.403	-3
Headache	2.8±0.59	1.3±1.25**	2.773	-1.5
Throat Issues	1.1±0.32	0±0.01**	2.656	-1.1
Trouble Breathing or Shortness of Breath	2.5±0.65	0.2±0.04***	4.301	-2.3
Cough a lot	1.8±0.41	0.3±0.17***	3.487	-1.5
Congested or having a Runny Nose	2±0.43	0.3±0.19***	3.782	-1.7
Feel Nauseous	1±0.3	0.2±0.16*	2.133	-0.8
Stomachache	1±0.29	0.4±0.34	1.364	-0.6
Diarrhea	0.71±0.21	0.2±0.13	1.536	-0.51
Back Pain	4.33±0.71	1.6±1.16***	4.577	-2.73
Muscle Pain	4.26±0.74	1.8±1.34***	4.038	-2.46
Able to Think Clearly	7.17±0.52	8.9±0.47***	-3.465	1.73
Energy Level	4.94±0.28	6.4±1.06***	-3.719	1.46
Feel Sleepy, Tired, or Fatigued	5.51±0.43	2.7±1.38***	5.876	-2.81

*Significant, **Very Significant, ***extremely significant

All control data represents the average subjective evaluations (scale 0-10) for each subject during the 3-day control period. The overall control averages are compared with the average subjective evaluations 1 hour after taking the product on day 4. For each parameter, the participants were asked to rank their daily health conditions. These conditions were rated 0 to 10. If the parameter was noted to be -, then 0 would be the optimal numerical value, and 10 would be the worst condition. If the parameter were noted to be +, then 0 would be the worst condition, and 10 would be optimal.

Table 3: Temperature and Oxygen Vital Signs-Statistical Comparison.

Statistics	Mean-Day 1 (n=25)	Mean-Day 6 (n=35)	t-value	p-Value
Temperature	96.6±0.48	98±0.35***	-5.24	<0.001
Oxygen	97.3±0.28	98.3±0.30**	-2.65	<0.01

Each value represents the average measurement of their vital signs for each of the subjects prior to day 1 product consumption and 1 hour after day 6 product consumption. Day 1 acts as a control because the product had not been taken.

Table 4: COVID-19 PATIENT Health\Wellness Data.

Patient #	Symptoms by Code	Symptoms Gone	
		Partial by Day	Completely by Day
1	RNC, LS, Hf	3	3
2	RNC, C, F, Hf	6	8
3	H, Hf, LS, P	5	5
4	LS, P, Hf	1	4
5	Hf, LS, B	12	12
6	Hf, C, RNC, H, P	8	10
7	L, LS, Hf	5	10
8	Hf, P, H, C, RNC	3	6
9	Hf, LS	1	1
10	Hf, H, F, P	1	5
11	B, Hf, H, RNC	7	9
12	Hf, LS	3	3
13	Hf, RNC, H, LS, L	1	4
14	Hf, F, LS	2	5
Average		4.9 Days	6.1 Days

Symptomology was monitored using a severity scale of 0-9. Partial or complete elimination of symptoms was determined accordingly. Complete removal was indicated by a score of 0. Symptoms by Code: B=breathing; LS=loss of smell/taste; L=lung issues; P=pain & body aches; Hf=high fever; RNC=runny nose and congestion; C=coughing; F=fatigue and brain fog; H=headaches. *p<0.0001 extremely significant difference.

COVID-19 Observations

All participants recovered 100% from the COVID-19 symptoms in an average of 6.1 days compared to the 10-20 days projected by CDC for normal recovery from mild COVID-19 infections¹ and a 3-6-week recovery for severe cases [31]. In this study, 29% of participants started showing recovery to COVID-19 symptoms after the first day of administering the "ELECTROCIDETM" dietary supplement and 36% of the COVID-19 participants were symptom-free by day 4. On average COVID-19 symptoms were entirely absent by day 6. Statistically, this recovery rate is extremely significant (p<0.0001). By the end of the study, all COVID-19 positive individuals were retested and shown to be COVID-19 negative.

Discussion

During this study, an overall participant enthusiasm increased daily in their celebration of emerging wellness. After 7 days of treatment, it was clear that all participants achieved some new wellness standard from taking "ELECTROCIDETM," and nearly all requested to continue the program after the end of the study. In

addition, there were no negative interactions or side effects reported from taking the dietary supplements from any of the participants. The present study clearly demonstrates the clinical benefits of short-term use of "ELECTROCIDETM." Vital sign measurements in Table 3 indicate a change toward normal body temperatures associated with wellness, where a statistically significant increase in body temperature was seen between days 1 and 6. Increased body temperature correlates with increased performance in neurocognitive activity [32]. Similarly, there was an overall increase in blood oxygen levels which reached statistical significance by day 4 (although only data for day 6 are presented). Furthermore, participants in Groups 1 and 2 showed a statistically significant improvement in focus, sleep, and energy after "ELECTROCIDETM" administration.

On the surface, it appears remarkable that a simple mineral solution could have such rapid and profound effects on human physiology. However, numerous studies indicate that common minerals found in dietary supplements, including "ELECTROCIDETM," have beneficial effects. For example, magnesium is a cofactor for more than 300 enzymes in the body and is involved with numerous

functions in the brain and muscles [33]. Calcium homeostasis is critical for the function of the skeletal system, regulation of hormonal secretion, transmission of nerve impulses, and a variety of vascular activities [34]. Sodium and potassium lower blood pressure, lower cholesterol, and prevent cardiovascular disease and stroke [35]. Trace minerals like Zn, Fe, Mn, Cr, and Cu are cofactors for various enzymes, and their role in health and disease has recently been reviewed [36]. In addition to these chemically based effects, DC microcurrents present in the aqueous electroceutical product used in the current study act synergistically with the minerals [6,7] to enhance its efficacy.

A Feasible Mechanism of Action

The "ELECTROCIDE™" product used in the present study is an aqueous form of electroceuticals, where micro-electric currents are generated between the metallic ions and the salts in the solution. Electroceuticals with microfluidic properties [37] have been generated using hydrogels embedded with electrode components, including metals and semiconductors [38]. The first application of electroceutical hydrogels was developed with nanoparticles of Ag and shown to generate 100uamps DC current and to be bactericidal with only one minute of exposure [39]. To our knowledge, "ELECTROCIDE™" is the first application of an aqueous electroceutical. We propose that the most likely mechanism of action of "ELECTROCIDE™" is by effecting bioelectric communication between non-neuronal cells and modulating their ion channels as previously stated [12].

It is further postulated that the "ELECTROCIDE™" product primarily affects squamous epithelial cells of the basal mucosa lining the inside of the mouth, where contact is first made when the product is ingested. In addition to the direct effects of ionic metals and salts on buccal epithelial cells, it is likely that the weak Electromagnetic (EM) fields generated from moving ions in the "ELECTROCIDE™" solution can also affect these mucosal epithelial cells. Indeed, weak EM fields have been shown to affect membrane permeability in cheek epithelial cells [40]. Furthermore, it seems reasonable that metallic, ionic solutions can also increase the absorption of vitamins and other nutrients across the plasma membrane [36]. Thus, the health benefits observed in the present study could also be mediated by the enhanced delivery of nutrients and supplements consumed by the subjects in the study [41-55].

Conclusion

The present study demonstrated the clinical benefits of short-term use of "ELECTROCIDE™." Vital sign measurements indicated a significant change toward normal body temperatures and overall increase in blood oxygen levels. In addition, several other

wellness parameters changed, including improvements in energy, focus, and sleeping. Additional benefits were seen in daily surveys for decreasing depression and anxiety, increasing happiness, improving breathing (where a difficulty was initially observed), reducing congestion, and decreasing chronic pain. Assessment of medical histories and additional notated conditions were lessened in severity for asthma, heart and lung conditions, various pains, stomach conditions, headaches, and skin conditions. There were no side effects noted during the study. The results from this study, and the preliminary observations from previous unpublished reports, indicate that there are many positive benefits towards wellness that can be gained from "ELECTROCIDE™."

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Author Contributions

All authors researched the data for the article, contributed to the discussion of the content equally, and contributed to the writing of the article. All authors also provided equal contribution to review the manuscript before submission.

Conflict of Interest

There were no conflicts of interest noted by any of the participants relative to their roles in the study.

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