

Research Article

Safety of Colloidal Silver Life Water as Homeopathic Antibiotic: Case from Ghana.

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Abstract: Objective: Colloidal silver water is a very controversial subject with mixed reports on effectivity and safety. Much of the augments is based on the long term effect on humans. However, there are still colloidal silver products being sold as homeopathic remedies and dietary supplements. The present paper discusses the safety issues of colloidal silver life water as homeopathic medicine in Ghana. **Methods:** Six samples of the product, colloidal silver water with the brand name Silver Life Water in a 750ml opaque bottle produced by Edigaf Services were sent to the Department of Theoretical and Applied Biology/Environmental Science and Chemistry for microbiological and physicochemical analysis at the Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana. The bacterial numbers and physicochemical properties of **Silver Life Water** and **Raw Water** were compared in the laboratory. **Result:** The microbiological report revealed that the Silver Life Colloidal Water is of **Very Good Quality** and that of the raw water was equally good. Both product samples are microbiologically **SAFE** for drinking. They conform to WHO Guidelines and Ghana Standards (GS) 175-1:2009. The physicochemical properties report also proved that, the Raw water and the Silver Life Colloidal Silver Water samples both meet the physicochemical quality requirements for drinking water based on the WHO and Ghana Standards GS 175-1: 2009 for drinking water quality parameters. **Conclusion:** The Colloidal Silver Life Water is safe in the Laboratory according to WHO Guidelines and Ghana Standards for drinking water quality. The product, silver Life Water could therefore be used as a homeopathic medicine in Ghana by alternative medicine Practitioners. This is the first research in Ghana that proved that silver water is safe in the laboratory.

Keywords: Colloidal silver water, Safety, Raw Water, homeopathic medicine, supplement.

INTRODUCTION

The field of homeopathic is the most controversial medical area in Ghana and globally. In Ghana, homeopathic medicine practitioners and their drugs are the most vibrant industry in the alternative medicine sector.

Homeopathic remedies are sourced or made from diverse compounds. One such product which has become very controversial is colloidal silver water. There are many practitioners in Ghana who have submitted products of such nature to the Food and Drugs Authority (FDA) with the hope of receiving approval. The key issue with silver water is the long term usage of these products. There is therefore the need for scientific fact on the safety of silver for long term use.

As a medical system, homeopathy is based on a simple concept that the body can cure itself. Practitioners of homeopathy use tiny amounts of natural substances, like plants and minerals. They believe these rouse the healing process. It was developed in the late 1700s in Germany. It's common in many European countries, but now very popular in Ghana. Homeopathy just like any other form of alternative medical system is regulated by the Traditional and Alternative Medicine Practice Council of the Ministry of Health based on Act 575 of the traditional medicine Act. Currently, the law has been repealed to provide a clear role of alternative medicine in Ghana. The new bill is the Traditional and Alternative Medicine bill 2018.

A simple concept behind homeopathy is "like cures like." In other words, something that brings on symptoms in a healthy person can -- in a very small dose -- treat an illness with similar symptoms. This is

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meant to trigger the body's natural defenses (Homeopathy. 2016).

A typical case study, red onion makes your eyes water. It is therefore used in homeopathic remedies for allergies. Treatments for other ailments are made from poison ivy, white arsenic, crushed whole bees, and an herb called arnica.

Homeopathic doctors (who also are called "homeopaths") weaken these ingredients by adding water or alcohol. Then they shake the mixture as part of a process called "potentization." They believe this step transfers the healing essence. Homeopaths also believe that the lower the dose, the more powerful the medicine. In fact, many of these remedies no longer contain any molecules of the original substance. They come in a variety of forms, like sugar pellets, liquid drops, creams, gels, and tablets (Homeopathy. 2016).

The question many are still asking is "what is this silver water? According to one significant account by Dr Axe, before the invention of the refrigerator, it was common practice to drop a silver coin into a container of milk as a preservative because silver was known to prevent the growth of algae, bacteria and other undesirable organisms. Interestingly, in ancient times, silver was also a popular remedy to stop the spread of diseases. Its use as a natural antibiotic continued all the way until the 1940s, when modern antibiotics surfaced.

In recent times, we don't need to drop silver coins into water to experience colloidal silver benefits! What is needed now is to carefully take a few drops from a bottle that you purchased in the store, which is:

A solution of water containing nanometre sized particles of suspended silver. The total silver content is expressed as milligrams of silver per litre (mg/L) of water which is numerically the same as parts per million (ppm). The total silver content is divided

into two forms of silver: ionic silver and silver particles (Inspire Nutrition, Silver Fact).

According to literatures there are three types of products promoted as "colloidal silver" categorized as:

- **Ionic silver**

These ionic silver solutions are products whose silver content primarily consists of silver ions. Although ionic silver is often marketed as colloidal silver, it's not true colloidal silver. Because it's the least expensive to produce, ionic silver is the most popular product in this category. The problem? It simply won't produce the same benefits that true colloidal silver can says Dr. Axe.

- **Silver Protein**

In order to keep large silver particles suspended, silver protein-based products add gelatin. Silver protein is the second-most popular type of colloidal silver product on the market and can easily be made by adding water to silver protein powder. Again, it's also often marketed and labeled as colloidal silver, but should not be confused for the real thing. Silver protein is less effective for human use, and you won't experience the true colloidal silver benefits.

- **True Colloidal Silver**

Finally, true silver colloids do not contain any protein or other additives, as the vast majority of the silver content consists of nanometre-sized silver particles.

METHODOLOGY

Six (6) samples of the Colloidal Silver Water in an 750ml Brown Plastic Bottle were sent to the Kwame Nkrumah University of Science and Technology, KNUST, Ashanti region, Ghana to the Departments of Theoretical & Applied Biology/Environmental Science and Chemistry for analysis. This is in line with the FDA in Ghana requirement of product registration. The product, Colloidal Silver Water was compared to Raw Water in the lab and results showed below:

1. MICROBIOLOGICAL ANALYSIS

Table 1: Bacterial number in SILVER LIFE COLLOIDAL SILVER Water and Raw Water Sample

Sample Identification	Faecal coliforms (cfu 100ml ⁻¹) Method: APHA 922D	Escherichia coli (cfu 100ml ⁻¹) Method: APHA 922D	Streptococcus (cfu 100ml ⁻¹) Method: APHA 922D	Total Heterotrophic Bacteria (cfu 1ml ⁻¹) Method: APHA 9215B
Colloidal Silver Water	0	0	0	0
Raw Water	0	0	0	1
Ghana Water Standards GS 175-1:2009	0	0	0	Max. 10⁵ to 10⁶
Sample Identification	Total coliforms (cfu 100ml ⁻¹) Method: APHA 922D	Sulfite Reducing Bacteria (cfu /100ml) Method: APHA 4500E	<i>Pseudomonas</i> (cfu 100ml ⁻¹) Method: APHA 9213E	
Colloidal Silver Water	0	0	0	
Raw Water	0	0	0	
Ghana Water Standards GS 175-1:2009	0	0	0	

DISCUSSION

The colloidal silver Life Water is of very good quality compared to Raw water per the analysis and microbiologically safe (Tab 1). Also the colloidal Silver life water contained no Total Heterotrophic Bacteria (cfu 1m1-1) as compared to the Raw Water which contained 1(Tab 1)

Mechanism of Action of silver Water:

A document(www.nema-uqd.info) written by Richard Davies and Samuel Etris of The Silver Institute in 1996, there are three primary ways that colloidal silver can help heal the body:

- Catalytic Oxidation: Silver naturally holds onto oxygen molecules, which readily react with the sulfhydryl (H) groups that surround bacterial and viruses. In turn, this helps block the life-preserving cellular process known as cellular respiration, which is defined as “the set of metabolic reactions and processes that take place in the cells of organisms to convert biochemical energy from nutrients into adenosine triphosphate (ATP), and then release waste products (Cellular Respiration).”
- Reaction with Bacterial Cell Membranes: Silver ions can attach to bacteria cell membranes directly and produce the same respiration-blocking effect.
- Binding with DNA: Shown to literally enter bacteria DNA, up to 12% of silver has been detected in *Pseudomonas aeruginosa*. According to one source, “While it remains unclear exactly how the silver binds to the DNA without destroying the hydrogen bonds holding the lattice together, it nevertheless prevents the DNA from *unwinding*, an essential step for cellular replication to occur (Educate Yourself Colloidal silver water).”

Health Significance

According to Dr. Axe (2018), there are about 8 Proven Colloidal Silver Benefits, Uses & Side Effects. Dr. Axe literature provided an objective analysis of silver Water:

1. Antibacterial and Antimicrobial

Colloidal silver has the ability to control antibiotic-resistant superbugs. According to his account, while employed at UCLA Medical School in the 1980s, Larry C. Ford, MD, documented over 650 different disease-causing pathogens that were destroyed in minutes when exposed to small amounts of silver (UCLA Medical Test on Colloidal Silver Water 2012).

Unlike its prescription antibiotic counterpart, colloidal silver water doesn't create resistance or immunity in the organisms that are killed by it. This point cannot be emphasized enough, especially in light

of the Centers for Disease Control and Prevention (CDC) recently reporting that more than 2 million people in the U.S. suffer illness every year as a result of antibiotic-resistant infections and 23,000 die from these infections (Biggest Threats and Data 2013).

Also a study published in the Journal of Alternative and Complementary Medicine supported ionic colloidal silver as a broad-spectrum antimicrobial agent against both aerobic and anaerobic bacteria, but its activity wasn't as pronounced against fungi (Morrill, K. *et al.*, 2013).

2. Wound Care/Skin Health

Robert O. Becker, MD, says that colloidal silver stimulates healing in the skin and other soft tissues (Banishing Disease with unlimited Amounts of Colloidal Silver). In a research article produced by Pharmacognosy Communications in 2012, it was precisely prescribed that certain colloidal silver formulations should be considered for topical use to treat burns, thrush, periodontitis and other conditions (Cock, I. *et al.*, 2012)

Example, according to Dr. Axe, you can treat ringworm (Tinea capitis) at home with colloidal silver because it's a potent anti-fungal. Caused by a fungus that lives on the top layer of the skin, ringworm presents as round, scaly patches. It's contagious and spread by skin contact and by contaminated materials, such as clothing.

He also emphasized that Colloidal silver benefits many skins conditions such as psoriasis and eczema as well. It's soothing to scrapes and even repairs tissue damage from burns. One product, a colloidal silver-based nanogel was successfully used as a dressing for superficial pellet gun wounds in a Journal of Family Medicine and Primary Care study (Dharmshaktu, G. S. *et al.*, 2016).

The combination of silver nitrate and sodium sulfadiazine to create SSD cream helped lead to burn recovery in many patients (Politano, A. D. *et al.*, 2013). Using a silver coating to specialized foam, as part of a wound vacuum system, provides antibacterial activity in vitro. “This technology may assist in preparing infected chronic venous stasis wounds for skin grafting, ultimately leading to better healing (Politano, A. D. *et al.*, 2013).”

3. Antiviral

Colloidal silver benefits can be used as an antiviral for HIV/AIDS, pneumonia, herpes, shingles and warts. Dr. Martin Hum, from the Institute for Optimum Nutrition, lists colloidal silver as one of the natural remedies to stop viruses fast (www.ion.ac.uk). Colloidal silver asphyxiates the virus and can even reduce the activity of the HIV virus in AIDS patients. There are

also numerous anecdotal accounts of colloidal silver's efficacy against the hepatitis C virus.

4. Anti-Inflammatory

Colloidal silver is also a fantastic anti-inflammatory remedy. Case in point: Researchers at the National Institutes of Health (NIH) studied the effects of inflammation after being treated by colloidal silver; they found that the inflamed skin of pigs treated with silver experienced near-normal skin after 72 hours, while other treatment groups not treated with silver remained inflamed (Nadworny, P. L. *et al.*, 2008).

5. Sinusitis

Promoted to avert sinus infections, colloidal silver can help people as a nasal spray, according to a study published in the International Forum for Allergy and Rhinology in 2014 (Goggin, R. *et al.*, 2014).

A 2018 study published in *Frontiers in Microbiology* proved that colloidal silver nasal rinses, when used twice daily for 10 days, is safe and effective for patients with chronic sinusitis.

Twenty-two patients completed the study and were given either oral antibiotic with saline rinses twice a day or colloidal silver nasal rinses twice daily. The results indicate that both forms of treatment showed similar improvements in sinusitis symptoms, and using colloidal silver in this manner for ten days was deemed safe (Ooi, M. L. *et al.*, 2018). Recent research indicates that hidden infections by pathogens could be a cause of respiratory inflammation associated with common allergies and asthma. Colloidal silver destroys *Pseudomonas aeruginosa* infections, which may be the reason why airborne allergy sufferers often find such dramatic relief from colloidal silver.

6. Cold/Flu

According to anecdotal evidence colloidal silver helps prevent all types of flu, including swine flu, as well as the common cold (COLLOIDAL SILVER. www.webmd.com). However, Few studies have been done to test this clinically, but in 2011 the NIH took 100 children under the age of 12 suffering from the common cold and nasal congestion and assigned them into two groups; the first group was treated with a solution of colloidal silver and beta glucan, and the second group with saline solution. Even though both groups benefited from the treatment, 90% of the people in the colloidal silver group completely recovered (Damiani, V. *et al.*, 2011)!

7. Pneumonia

Allopathic drugs have suffered a setback in potency when it comes to averting bronchitis or pneumonia. Conventionally, antibiotics are administered as the first line of defense, but when the pneumonia is viral, antibiotics would not help in the least says Dr. Axe. According to him, the nice thing

about colloidal silver is that it can help regardless of the pathogen. "Colloidal silver is a remarkable product to help fight against bronchitis and pneumonia when ingested internally, but an even more effective way to utilize it? Simply breathe it into your lungs. This way, the silver directly contacts the germs residing in the lungs, which are causing bronchitis or pneumonia. It's basically the same thing as using respiratory support, and it works speedily, clearing it up within a couple of days", he concluded.

CONCLUSION AND RECOMMENDATION

There are so much supporting documents to prove that colloidal silver water has antibacterial ability. Though, there is a growing concern about the long term safety on human. More research work has to be conducted in Ghana on human to ascertain this safety issues and must start from somewhere. Promoters of silver water in Ghana as homeopathy antibiotic should take every precautionary measures to monitor the post treatment side effect of these products as pertain to all FDA approved products.

Although the National Center for Complimentary and Integrative Health reports that colloidal silver may cause poor absorption of some drugs, there is also limited research proving that side effects to colloidal silver use even exist (Colloidal Silver. <https://nccih.nih.gov/health/colloidalsilver>).

Though the author of this paper came across many cautions about silver water producing permanent condition called argyria (when people turn blue). However, this is caused by misuse not of true colloidal silver, but through other cheaper and not well tested products marketed as colloidal silver. This product Colloidal silver life water has been well analyzed at the Departments of Theoretical & Applied Biology/Environmental Science and Chemistry signed by a well-respected food/Environmental Microbiologist at the Kwame Nkrumah University of Science and Technology and proven to be VERY GOOD QUALITY based on WHO Guidelines and Ghana Standards (GS) 175-1:2009.

Warning on Product Labels

The author recommended that, because colloidal silver is such a potent antibacterial agent, homeopaths should always supplement with probiotics for their patients or put warning labels on their products so that users maintain a proper balance of microflora.

Conflict of Interest

The author of this paper reports no conflict of interest.

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