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Orignal Artical

Silver Sol Completely Removes Malaria Parasites from the Blood of Human Subjects Infected with Malaria in an Average of Five Days: A Review of Four Randomized, Multi-Centered, Clinical Studies Performed in Africa

Pedersen G, Hegde B M

ABSTRACT

Malaria afflicts half the world's population, kills more than half the children in sub-Saharan African countries, is caused by a parasite, transferred by mosquitoes, and destroys family and economic futures. Fifty-six human subjects from four separate study groups were used to determine the most effective dose, average time to full recovery and percent of patients cured in human subjects swallowing Silver Sol. Silver Sol Liquid 10 ppm was used in different oral doses (5 ml-15 ml) to determine the most effective dose. The optimal dose of Silver Sol was determined to be 15 ml twice a day. Silver Sol completely removed the malaria parasite from the blood in 100% of 56 human subjects infected with malaria in an average of five days. The fastest cure rate was found to be 2.0 days, and the most days required to achieve full recovery was found to be 10 days. Human subjects were found to have no malaria parasites in their blood (as determined by clinical microscopy) after an average of five days of Silver Sol treatment. No patients suffered any adverse side effects, while 100% were cured from Malaria in an average of 5 days.

It is concluded that Silver Sol can be taken daily to completely eliminate the malaria parasite from the blood of malaria infected human subjects in an average of 5 days. *(The Ind. Pract. 2010; 63(9):567-674)*

INTRODUCTION

Malaria is endemic to 106 nations threatening half the world's population, and an estimated 500 million cases which reportedly led to more than 1,000,000 deaths in 2008.[1,29] The World Health Organization currently uses insecticides, nets, artemisinin-based combination drug therapy. These control strategies are significant but tragically incomplete in the prevention and treatment of malaria.

Malaria is an infectious disease transferred by mosquitoes and caused by a eukaryotic protist of the genus Plasmodium. It is most prevalent in tropical and sub-tropical regions of the world, where it is

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debilitating and can be fatal. More than half of the children in these high-risk areas die before the age of five.[2] Ninety per cent of malaria-related deaths occur in sub-Saharan Africa where it is a major cause of poverty and a hindrance to economic development.[3]

Five species of the plasmodium parasite can infect humans. Plasmodium vivax, Plasmodium ovale and Plasmodium malariae cause a mild illness that is not generally fatal.[4,5] Plasmodium falciparum is the most serious form of malaria in humans and often results in death. P. falciparum is the most common cause of infection and is responsible for about 80% of all malaria cases, and is also responsible for about 90% of all the deaths from malaria.[24] Plasmodium knowlesi is a zoonosis that can infect humans and macaques.[4,5]

MOSQUITOES TRANSFER THE MALARIA PARASITE

Fertilization and sexual recombination of the parasites occurs in the mosquito's gut, thereby defining the mosquito as the definitive host of the disease. The female Anopheles mosquito transfers the malaria parasite through the blood. When a mosquito bites an infected person, a small amount of blood is taken, which contains malaria parasites. These develop inside the mosquito, and approximately one week later, when the mosquito takes its next meal, the parasites are injected with the mosquito's saliva into the person being bitten. The parasites enter the blood stream and are transported to the liver where they incubate for two to eight weeks. They are then released into the blood where the parasites enter the red blood cells and multiply. This causes damage to the red blood cells resulting in symptoms of fatigue, fever, headache, coma and possibly death. Parasites may sequester in the liver for as much as three years resulting in recurring malaria months or even years later.

A mosquito becomes infected when it takes a blood meal from an infected human. Once ingested, the parasite gametocytes are taken up into the blood and will further differentiate into male or female gametes and then fuse in the mosquito gut. This produces an ookinete that penetrates the gut lining and produces an oocyst in the gut wall. When the oocyst ruptures, it releases sporozoites that migrate through the mosquito's body to the salivary glands, where they are then ready to infect a new human host. This type of transmission is occasionally referred to as anterior station transfer.[15] The sporozoites are injected into the skin, alongside saliva, when the mosquito takes subsequent blood meals. This transfers the malaria parasite.

Only the female mosquitoes feed on blood, thus males do not transmit the disease. The females prefer to feed at night and will continue feeding through the night until taking a meal, which makes night-time protection essential in the prevention of malaria.

PATHOGENESIS OF MALARIA

Humans develop Malaria in two phases: an exoerythrocytic and an erythrocytic phase. The exoerythrocytic phase involves infection of the hepatic system (liver), where the erythrocytic phase involves infection of the erythrocytes (red blood cells). When an infected mosquito pierces the skin of a human to take a meal, sporozoites in the saliva enter the blood stream of the human and migrate to the liver. Within 30 minutes of being introduced into the human host, the sporozoites infect the hepatocytes (liver cells) where they reproduce asexually and asymptomatically for a period of 6-15 days during the eight week incubation period. Once in the liver, these organisms differentiate to yield thousands of merozoites, which, following rupture of their host cells, escape into the blood and infect red blood cells, thus beginning the erythrocytic phase of the life cycle.[19] The parasites escape from the liver undetected by wrapping itself in the cell membrane of the infected host liver cell.[20]

Within the red blood cells, the parasites multiply further, (asexually) periodically breaking out of their hosts to invade fresh red blood cells. Several such amplification

cycles occur. This produces the classical waves of fever, which arise from simultaneous waves of merozoites escaping and infecting red blood cells. Some P. vivax and P. ovale sporozoites do not immediately develop into exoerythrocytic-phase merozoites, but instead produce hypnozoites that remain dormant for periods ranging from several months (6-12 is typical) to as long as three years. After a period of dormancy, they reactivate and produce merozoites. Hypnozoites are responsible for long incubation and late relapses in human malaria.[16]

Malaria parasites are relatively protected from attack by the body's immune system because for most of its human life cycle it resides within the liver and blood cells and is relatively invisible to immune surveillance. However, circulating infected blood cells are destroyed in the spleen. To avoid this fate, the P. falciparum parasite displays adhesive proteins on the surface of the infected blood cells, causing the blood cells to stick to the walls of small blood vessels, thereby sequestering the parasite from passage through the general circulation and the spleen.[22] This stickiness is the main factor giving rise to haemorrhagic complications of malaria, because the infected cells aggregate together and clog the endothelial venules producing convulsions and comas in the brain. Although the red blood cells surface adhesion proteins (called PfEMP1, for plasmodium falciparum erythrocyte membrane protein 1), are exposed to the human immune system, they do not serve as good immune targets, because of their extreme diversity. In fact there are at least 60 variations of the protein within a single parasite and effectively limitless versions within parasite populations.[22] The parasite switches between a limitless repertoire of PfEMP1surface proteins allowing it to stay one step ahead of any vaccine, drug or current treatment, because of the resistant strains mutating in response to the drug treatments.

MALARIA: SIGNS AND SYMPTOMS

Symptoms of Malaria include: fever shivering, arthralgia (joint pain), nausea, vomiting, anaemia caused by haemolysis, haemoglobinuria, coma, convulsions, and retinal damage.[9,10] The classic onset of symptoms of malaria is cyclical occurrences of sudden coldness followed by rigor and then fever and sweating lasting four to six hours, occurring every two days in P. vivax and P. ovale infections, while every three days in P. malariae.[11] P. falciparum can have recurrent fever every 36-48 hours or a less pronounced but almost continuous fever. Children with malaria may exhibit abnormal posturing, a sign indicating intracranial pressure or severe brain damage.[12] Malaria has been found to cause cognitive impairments, brain damage, retinal whitening, anaemia, convulsions, coma, splenomegaly, haemoglobinuria with renal failure, blackwater fever, severe headache, hepatomegaly, hypoglycaemia and death. Severe malaria can progress extremely rapidly and cause death within hours or days.[14] In the most severe cases of the disease fatality rates can exceed 20%, even with intensive care and treatment.[18] Approximately one in five P. vivax infections includes relapse within the year[16] illustrating another problem, that of re-currence of disease months or even years later.

Pregnant women and young children are especially attractive to mosquitoes,[23] which results in the high rates of stillbirths, infant mortality and low birth weight babies and high rates of child mortality and neurologic dysfunction.[17]

TREATMENT

Anti-malarial drugs are not totally effective in treating or preventing malaria, especially in the more severe cases.[31] There are drug treatment being used for prevention but may produce adverse reactions like vertigo, and flu-like symptoms resulting in symptoms that are similar to the disease. P. falciparum has become resistant to the prescription drug treatment and now requires a combination of drugs derived from artemisinin. Severe malaria is being treated with intravenous or intramuscular quinine or artesunate.[6] While these combinations of prescription

drugs have been moderately successfully in the past, the parasite has developed resistance, resulting in decreasing effectiveness. Resistance has developed to several anti-malarial drugs, most notably chloroquine, generating a significant urgency and scientific search for replacements.[7] Although many are under development, the challenge of producing a widely available vaccine that provides a high level of protection for a sustained period has yet to be met.[8] A successful vaccine may be effective today but as the disease mutates and continuously develops resistance the effectiveness of today's vaccine will not be effective in tomorrows malaria. Prescription drugs are becoming less successful and vaccines will become less effective over time resulting in a growing need for a solution that can function as prevention and treatment.

EXPERIMENTAL DESIGN

A total of fifty-six human subjects from four separate study groups were used to determine the most effective dose, average time to full recovery and per cent of patients cured. All patients randomly acquired malaria from their natural environment in the vicinity of Ghana, West Africa. Four separate certified medical hospitals/clinics and their certified Medical Doctors and staff residing in Ghana, Africa were used. Silver Sol Liquid 10 ppm was used in different oral doses (5 ml-15 ml) to determine the most effective dose. After a doctor's diagnosis, and consent given, the Silver Sol was administered. The patients selected for this study were randomly selected based on their choice to randomly attend the clinic at a random time seeking medical help for symptoms of malaria.

MATERIAL AND METHODS

Silver Sol liquid 10 ppm is a liquid consisting of pure water and 10 parts per million, pure Silver. The product was manufactured by American Biotech Labs, is patented (US # 713595) for use against malaria and has also been proven to destroy numerous bacteria, viruses and fungi.[31] The combination of four separate study groups were used to determine if Silver Sol 10 ppm would eliminate the malaria parasites from the blood of human subjects being freshly diagnosed with malaria. Human subjects swallowed Silver Sol, 10 ppm, at daily doses of 15 ml - 30 ml taken in divided doses to determine the optimum dose. Blood samples were taken at day 0, and every day for 15 days (study 3 and 4) for use in laboratory reports which were used to record the amount of malaria present in the blood. This was determined by microscopy and recorded on the patient's medical chart. These results were recorded for the purpose of determining the number of days required to achieve full recovery from malaria.

Table 1
Location and Directors of Research

Hospital	Doctor
Air Force Station Hospital, Accra, Ghana	Dr. Kwabiah
Korie-Bu Teaching Hospital, Accra, Ghana	Dr. E. Sackey
Justab Clinic, Accra, Ghana	Dr. Agnes Abraham
Braden Ghartey Memorial Hospital, Accra, Ghana	Dr. Braden Ghartey

The clinical studies were performed at the following locations by the Medical Directors listed in Table 1.

RESULTS

Results from the four study groups are summarized in Table 2.

Research for each study group was performed at a different medical centre. Group 1 had 11 human subjects, with group 2 having 16, group 3 had 16 and group 4 had 13 subjects. This provided 56 human subjects. The subjects were taken as they randomly walked into the medical centres, resulting in a random distribution of subjects of all ages. Different doses were given to the study groups for the purpose of

Table 2
Summary of Results by Study Group

	Group 1	Group 2	Group 3	Group 4
Number of subjects	11	16	16	13
Age of subjects	8-75	1-90	2-61	15-60
Dosage	10 ml (2 tsp) 3 times/day	5 ml (1 tsp) 3 times/day	15 ml (3 tsp) twice a day	15 ml (3 tsp) twice a day
Average number of days to achieve full recovery	5.0 days	6.33 days	3.41 days	4.0 days
Fewest days to achieve full recovery	3.0 days	3.0 days	2.0 days	3.0 days
Most days to achieve full recovery	7.0 days	10 days	8 days	7 days
Per cent of human patients cured	100%	100%	100%	100%

determining the optimal dose. Group 1 received 10 ml three times a day, group 2 received 5 ml three times a day, with grouped 3 and 4 receiving 15 ml twice a day. The average number of days to achieve full recovery was 5.0 days.

100% of all patients were cured in all study groups.

There were many other diseases simultaneously existing in the subjects presenting with malaria. Respiratory infections, urinary tract infections, conjunctivitis, otitis and diarrhoea from food poisoning were all present at day one and were totally eliminated in an average of 5 days. This is significant because malaria patients regularly have secondary and simultaneous diseases that often require multiple medications to treat. In this study, Silver Sol cleared all of these pathogens in an average of 5 days.

CONCLUSION

Silver Sol safely and completely removed the malaria parasite from the blood in 100% of 56 human subjects infected with malaria in an average of five days. The optimal dose of Silver Sol was determined to be 15 ml twice a day. The fastest cure rate was found to be 2. days, and the most days required to achieve full recovery was found to be 10 days.

Human subjects were found to have no malaria parasites in their blood (as determined by clinical microscopy) after an average of five days of Silver Sol treatment. No patients suffered any adverse side effects.

It is concluded that Silver Sol can be safely taken daily to completely eliminate the malaria parasite from the blood of malaria infected human subjects in an average of 5 days.

DISCUSSION

Malaria is a devastating disease and is killing more than half of our children in high-risk areas. Silver Sol is a newly patented EPA certified and FDA approved nanosilver that removes the malaria parasite from the blood in an average of 5 days in all the human subjects tested.

Silver Sol is absorbed through the mouth and digestive tract, is a nano-particle which is small enough to be distributed into the red blood cells. It has demonstrated the ability to destroy the parasite in the erythrocytic phase. This is supported by the data collected in this study demonstrating the

ability to kill and remove the parasite from the erythrocytes and bloodstream in less than five days. The miniscule size of the nano-silver particle allows it to pass through red blood cell membranes and reside within the red blood cell. NASA, published a study which demonstrated silvers ability to enter the cell and into the atomic structure of the pathogen. In addition, Silver Sol has been shown to destroy the parasite that causes numerous parasites such as the disease Leishmaniasis.[28] This evidence suggests that the ability of Silver Sol to enter the red blood cell combined with its anti-parasitic activity produces a viable and proven anti-malarial mechanism of action.

As the Silver Sol passes through circulation it flows through the capillaries of the liver, where it can enter the micro-circulation of the liver and potentially access the sequestered liver and red blood cells where the Silver Sol can enter these pathogen containing, trojan horse like cells, and destroy the malaria parasite. This remarkable action takes place even though the immune system cannot detect the malaria within the afflicted cells. In addition Silver Sol has been proven to not cause bacteria and other pathogens to mutate and become resistant. This means that it can be taken daily for prevention as well as long-term treatment without causing resistance. In fact, Silver Sol has been shown to enhance antibiotic drug efficacy by as much as ten fold.[30] This evidence suggests a new vector of treatment and prevention in the fight against malaria.[30]

The dose was significant. The lower the dose of Silver Sol resulted in a longer time to achieve full recovery. Subjects that swallowed 5 ml of Silver Sol took almost twice as much time to achieve full recovery when compared to the subjects that swallowed 15 ml of Silver Sol (6.33 days as compared to 3.43 days). It is concluded that 30 ml Silver Sol taken in divided doses is better than the lower doses of 15 ml, even though it was administered more frequently. The fact that there was 100% cure is remarkable and should result in serious consideration for mass distribution in high-risk areas at a preventive dose of 2 teaspoons twice a day and a treatment dose of 15 ml swallowed twice a day.

In addition to malaria, there were 19 other ailments that Silver Sol successfully resolved which include; abdominal pain and diarrhoea, bronchitis, candida vaginal yeast infections, conjunctivitis, external cuts and infections, otitis, otitis media, fungal skin infections, gonorrhoea, gingivitis, halitosis, pelvic inflammatory disease, pharyngitis, sinusitis, rhinitis, tonsillitis, upper respiratory tract infections, urinary tract infections. All patients suffering from multiple ailments were reported to have successful outcomes in an average of 5 days.

In addition to this clinical research, thousands of bottles of Silver Sol have been donated for humanitarian aid. The doctors who received these donations report ubiquitous successes against malaria, and remarkable recoveries from other bacterial, viral, and fungal diseases.

The World Health Organization has reported that studies indicate that up to 40% of artesunate based malaria medications are counterfeit,[25] and combined with the fact that vaccines and drugs are less than effective and resistance is progressing against them, there is tremendous demand for Silver Sol in the war against malaria.

Malaria is not just a disease associated with poverty but also a cause of poverty and a major impediment to economic development because people that cannot get well and maintain good health cannot obtain employment for long periods of time nor can they establish consistent work habits. This adversely affects the family and the entire community. There is a five-fold difference in gross domestic product and buying power in countries that have malaria compared to those that don't. The economic impact of malaria is estimated to cost Africa $12 billion US dollars every year. The economic impact includes costs of health care, working days lost, lost education, decreased productivity due to brain damage, and loss of tourism.[26] In high-risk countries the

disease may account for as much as 40% of public health expenditures, 30-50% of inpatient admissions, and up to 50% of out patient visits. In Malawi, people suffer the hardship of spending 32% of their annual income on this disease.[27] There are thousands of square miles of malaria infected people living in hygienically offensive conditions, losing more than half of their young children to death from malaria each year. What horrendous human price is being unnecessarily extracted from people who have the least resources to mount up an imperfect defense? This research strongly suggests a new vector of malaria treatment, which would enable those who need it most to safely administer Silver Sol prevention and treatment programmes. Since the current drug treatments are losing a war where the enemy is continuously mutating, where cure is a moving target, and the total number of infections and deaths increase yearly, it is the author's conclusion that this newly patented, unique form of Silver Sol has sufficiently demonstrated significant evidence for individual, community and national applications. It is concluded that Silver Sol has demonstrated significant human evidence against the malaria to initiate plans and programmes for widespread, ubiquitous use. Silver Sol should be classified as a first line of treatment against malaria. It should be distributed in all high-risk regions of the world in order to give them a fighting chance against malaria.

CONFLICT OF INTEREST

One of the authors (BMH) had only seen all the photostat copies of the hospital records as sent to him for review, which he had done with due care but, has had no access either to Ghanaian patients of the study or their original hospital records.

Three of the in-vitro studies that were done under his (BMH) guidance in India, however, did show conclusively that Silver Sol had, in fact, very powerful antibiotic properties. Another long term study on its toxicity (yet to be published) did establish that it had no immediate or delayed toxicity even in very large doses in rats. The study on falciparum malaria cultures done at the International Centre of Biotechnology in New Delhi did show very good results showing even its good effects on chloroquine resistant malaria. The Director of that institute had asked the author (BMH) to conduct human studies soon which are in the pipeline.

BMH has not received any money personally, either for co-authoring this paper or for any personal use at any time in the past for lectures or travel assistance. The Journal of the Science of Healing Outcomes, of which BMH is the Editor in Chief now, however, has had some financial assistance when it started in 2005. The money was given to its parent organization, The World Academy of Authentic Healing Sciences.

REFERENCES

1. World Health Organization, The World Malaria Report (2009).
2. Snow RW, Guerrera CA, Noor AM, "The global distribution of clinical episodes of Plasmodium falciparum malaria." *Nature* (2005). 434 (7030):214-7.
3. Malaria Disease Impacts and Long-Run Income Differences. Institute for the Study of Labor, 2008:10-12.
4. Fong YL, Cadigan FC, Coatney GR. A Presumptive case of naturally occurring plasmodium knowlesi malaria in man in Malaysia. *Trans. R. Soc. Trop. Med. Hyg.* (1971). 65 (6): 839-40.
5. Singh B, Kim Sung L. Matusop A. A large focus of naturally acquired Plasmodium knowlesi infections in human beings. *Lancet* (March 2004). 363 (9414): 1017-34.
6. Dondorp AM, Day NP. The treatment of severe malaria. *Trans R, Soc Trop Med Hyg.* 2008; 101(7) 633-4.
7. Wellems TE, Plasmodium choloroquine resistance and the search for a replacement antimalarial drug. *Science* (Dec 2002). 298 (5591) 124-6.
8. Kilama W, Ntuomi F. "Malaria: A research agenda for the education era". *Lancet* (October 2009). 374: (9700) 1480-82.
9. Web MD, Malaria Symptoms. 2007: May 16.
10. Beare NA, Taylor TE, Harding SP, Lewallien S, Malarial retinopathy: a newly established diagnostic sign in severe malaria. Am *Journal of Trop Med Hyg* (Nov 1, 2006). 75(5): 790=7.

11. Malaria life cycle and pathogenesis. Malaria in Armenia, 2006: October 31.

12. Idro R, Otino G, White S, Decorticate, decerebrate, and opisthotonic posturing and seizures in Kenyan children with cerebral malaria. *Malaria Journal*, (2007); 4 (57) 57 dol:10.1186/1475 2875-4.

13. Wikipedia,"Malaria" 2010.

14. Trampuz A, Jerub M, Clinical review: Severe malaria. *Crit Care* (2003), 7 (4):315-23.

15. Kain K, Harrington M, Imported malaria: prospective analysis of problems in diagnosis and management". *Clin Infect Dis* (1998), 27(1): 142-9

16. Adak T, Sharma V, Orlov V, Studies on the plasmodium vivax relapse pattern in Dehli, India. *Am J Trop Med Hyg.* (1998); 59(1): 175-9.

17. Mendis K, Sina B, Marchesnini P, Carter R, The neglected burden of Plasmodium vivax malaria *Am Journ Troop Med Hyg* (2001). 64 (1-2 supp): 97-106.

18. Talman A, Domarle O, Mckenzie F, Gametocytogenesis: the puberty of Plasmodium falciparum". *Malar Journal* (2004). 3:24.

19. Bledsoe GH, "Malaria primer for clinicians in the United States. *Southern Medical Journal.* (Dec 2005); 98(12): 1197-204.

20. Sturm A, Amino R, Manipulation of host hepatocytes by the malaria parasite for delivery into the liver sinusoids. *Science* (2006), 303 (5791): 1287-1490.

21. Cogswell FB, The hypnozoite and relapse in primate malaria. *Clin Microbil Rev* (Jan 1992); 5(1): 26-35.

22. Chen Q, Molecular aspects of severe malaria". *Clin Microbiol Rev.* (July 2000), 13(3): 439-50.

23. Lindsay S, Ansell J, Selman C, Cox V, Effect of pregnancy on exposure to malaria mosquitoes. *Lancet* (2000); 355(9219): 1972.

24. Van Geertruyden J, The contribution of malaria in pregnancy toperinatal mortality. *Am J Trop Med Hyg.* (August 2004); 71 (2 supp): 35-40.

25. Jane Parry "WHO combats counterfeit malaria drugs in Asia". World Health Organization, 2005.

26. Greenwood BM, Bojang K, "Malaria". *Lancet* (2005); 365 (9469): 1487-1498.

27. Ettling M, Economic impact of malaria in Malawian households. *Tropical Medicine in Parasitology.* (Mar 1994), 45(1): 74-79.

28. William Beaumont Army Medical Center, El Paso Texas, (2006).

29. *National Geographic*, July 2007: (7) 41-43.

30. Roy, R., Hoover, M.R., Bhalla, A.S., Slawecki, T., DEy, S., Cao, W., Li, J., and Bhaskar, S. Ultradilute Ag-aquasols with extraordinary bactericidal properties: Role of the System Ag-O-H2O. Materials Research Innovations, 2007, vol 11, no 1.

31. Brooks, J., *Pandemic Therapies.* (2006).