International Journal of Homoeopathic Sciences

E-ISSN: 2616-4493
P-ISSN: 2616-4485
www.homoeopathicjournal.com
IJHS 2023; 7(1): 474-478
Received: 01-10-2022
Accepted: 03-11-2022

Dr. Radha Mangukiya
Assistant Professor, Department of Pathology, Vidhyadeep Homeopathic Medical college and Research Center, Vidhyadeep University, Surat, Gujarat, India

Dr. Nidhi Joshi
Professor, Department of Forensic Medicine and Toxicology, Jalaram Homoeopathic Medical College, Morva (Rena), Godhra, Gujarat, India

Dr. Harshna Goti
Assistant Professor, Department of Repertory, Vidhyadeep Homeopathic Medical college and Research Center, Vidhyadeep University, Surat, Gujarat, India

Corresponding Author:
Dr. Radha Mangukiya
Assistant Professor, Department of Pathology, Vidhyadeep Homeopathic Medical college and Research Center, Vidhyadeep University, Surat, Gujarat, India

Original research article: Study of effectiveness of homeopathic remedies in treatment of malaria

Dr. Radha Mangukiya, Dr. Nidhi Joshi and Dr. Harshna Goti

DOI: https://doi.org/10.33545/26164485.2023.v7.i1h.792

Abstract
Background: One of India's biggest public health issues is malaria. Malaria is frequently linked to poverty, but it also contributes to it and hinders economic growth. The risk affects approximately half of the world's population (3.3 billion), making it the sixth largest cause of mortality globally.
Objectives: The study's goal was to determine the function of a set of predetermined homoeopathic medications in the treatment of malaria.
Methods: Out of 180 assessed cases, 36 individuals in all were enrolled. The research included patients who had the typical clinical signs and symptoms of malaria and had tested positive for the malaria parasite in a blood test. Based on typical malaria symptoms, experimental medications were chosen from the mainstream homoeopathic literature. Using a student t test calculator online, statistical analysis was performed. p value less than 0.05 recognized as a significant.
Results: Of 36 individuals who tested positive for malaria, the majority (41.66%) had temperatures over 102°F. Just 8 patients had palpable spleens. (22.22%) In 21 individuals, mild body & muscular aches were detected. (58.33%). 22 individuals had mild fatigue and moderate sweating. (20) and (61.11%), respectively. Thirteen individuals (36%) reported experiencing nausea and vomiting. The mean MSS score at the beginning of the treatment was 12.2±1.6, and at the conclusion it was 6.9±3.4 (p 0.05). ESR value decreased as well and results were statistically significant. According to indications, the most often given medications were arsenic album (n=12, 33.33%),

Keywords: Malaria, homeopathy, effectiveness

Introduction
Malaria is a dangerous and sometimes fatal disease caused by a parasite that often infects a specific species of mosquito which feeds on people. Malaria often causes severe disease, including high fevers, shivering chills, and flu-like symptoms. Malaria can be fatal, however most cases of sickness and death from malaria can be avoided [1, 2].
The parasite that causes malaria is a disease spread by mosquitoes [3]. Malaria patients frequently experience fever, chills, and flu-like symptoms. If they are not treated, they might have fatal consequences. Around 241 million cases of malaria were reported globally in 2020, and 627,000 people died from the disease, predominantly children in sub-Saharan Africa. Each year, the United States diagnoses about 2,000 cases of malaria. Travelers and immigrants arriving in the United States from nations where malaria transmission occurs, many of whom are from sub-Saharan Africa and South Asia, account for the great majority of cases [4,5].
Homeopathy is utilized in a number of developed nations, including Brazil and India, where it is a primary treatment option and is integrated into the healthcare system. In India, where there are 120 million people, about 10% of the population uses homoeopathy as their preferred form of care [6], and similar figures are found in Brazil. Its usage is especially common in Bahia and the South [7]. In Western nations, the viability of homoeopathic medicine is debated.

Materials and Methods
This cross-sectional study was carried out over the course of six months, from September 2022 to February 2023, at Vidhyadeep Homeopathic Medical College & Research Center.
The Declaration of Helsinki was followed in the study procedure.
To start, a study was carried out to identify the regions with a high frequency of malaria with the assistance of local health officials. The regular house-to-house visits by a team of doctors and lab technicians in the nearby areas added to the screening and referral of malaria Patients.

A total of 180 patients of various ages and genders underwent screening; of them, 36 cases with positive blood tests for the malaria parasite were recruited.
All patients provided their informed permission, and for children, the same was true of their parents or legal guardians. Every patient was tracked through their seventh day of sickness. Pre- and post-treatment laboratory confirmation was performed. Participants treated as outside patients in the trial comprised those with the traditional clinical signs and symptoms of malaria.
Traditional symptoms, such as chills, heat, and perspiration in that sequence, are taken into account while deciding whether to enroll a patient in the research. Together with these symptoms, it is also accompanied with bodily aches, nausea, vomiting, exhaustion, and soreness in the abdomen. Significant symptoms were a high body temperature, excessive sweating, and an enlarged spleen. Participants were included in the trial and given laboratory tests if they had all of the aforementioned major symptoms.

Exclusion criteria
Patients with *P. falciparum* infection and presenting with the symptoms such as severe anemia, jaundice, fluid in the lungs (pulmonary edema), kidney failure, convulsions, paralysis, coma, marked prostration, and marked delirium were excluded from the study.
Laboratory investigations of blood and urine were performed. A thick blood film observation every 10 – 12 hours for 3 days was performed for the demonstration of the parasite along with Hb (at entry and after the fever subsides or after 7 days, whichever is earlier), TLC, DLC, and ESR.
Based on typical malaria symptoms, experimental medications were chosen from the mainstream homoeopathic literature [7]. Natrum muriaticum, *Nyctanthes arbor tristis*, Arsenicum album, *Cinchona officinalis*, *Pulsatilla*, *Rhus toxicodendron*, *Eupatorium perfoliatum*, Ipecacuanha, Natrum sulphuricum, Natrum arsenicum, *Gelsemium*, *Azadirachta indica*, *Caesalpinia bonducella*, and *Alstonia constricta* were the experimental medications.
In each case, a thorough case recorder was completed, and the medicine (simillimum) was prescribed in accordance with homoeopathic principles.
Every medication was given a 30/200 potency. Depending on the instance, potency was increased as necessary, and medication was repeated every few minutes to hours until a noticeable difference was observed (improvement of signs and symptoms, the appearance of new symptoms, worsening of signs and symptoms).All follow up actions were taken as per homeopathic principles. All patients were called for follow-up daily or on an alternate day till the seventh day of enrolment or till the fever disappeared, whichever was earlier.
The council created the Malaria Symptom Scale (MSS) as a gauge for the severity of the disease. The MSS was calculated by taking into account 8 signs and symptoms, including temperature, fever stages, spleen enlargement, headache, nausea, vomiting, bodily pain, weariness, and sweat (Table 1). The overall MSS rating was regarded as S1. Another scale (S2) with a range of 1 to 7 was created, where a patient presenting for treatment on the first day of infection received the highest score of 7, and a patient presenting on the seventh day received the lowest score of 1. The highest possible score was 32. As stated in table 1, patients were divided into three severity groups based on the baseline symptom score: mild (1-11), moderate (12-22), and severe (23-32).

Table 1: Malaria symptom score MSS assessment on every visit

Symptom/ score	**0**				**1**	**2**	**3**	**4**	**Concomitants**
Temperature	100				101	102	103	104	
Stages of fever					Only chill	Only heat	Chill followed by heat	All stages prominent	
Spleen enlargement	0 - Not palpable				2 - palpable				
	0				1	2			3
Nausea &vomiting	absent	mild	moderate	Severe	mild	moderate			Severe
Fatigue	absent	mild	moderate	Severe	mild	moderate			Severe
Perspiration	absent	mild	moderate	Severe	mild	moderate			Severe
Headache	absent	mild	moderate	Severe	mild	moderate			Severe
Body & muscle ache	absent	mild	moderate	Severe	mild	moderate			Severe

The improvement of the cases was assessed based on this MSS and the blood test for Malaria parasite. The primary outcome measure was a negative blood test for Malaria parasite and the secondary outcome measure was the reduction in MSS scale.
Statistical analysis was carried out using online student t test calculator. p value less than 0.05 considered as a significant.

Results
180 individuals were screened over the one-year research period, and of them, 36 patients (26 females and 10 males) had malaria-positive diagnoses and were monitored for seven days.
Table 2 provides information on the cases' demographics.
Participants' average ages were 23.5±12.2 years.
The majority of participants (33.33%) are in the 0 to 10 year age range.

Table 2: Age wise distribution of participants

Age Group(year)	Number (Percentage %)	Mean age ± SD
0-10	12(33.33%)	23.5±12.2
11-20	5(13.88%)	
21-30	6(16.66%)	
31-40	8(22.20%)	
41-50	3(8.33%)	
>51	2(5.55%)	

Table 3: distribution of participants according to duration of disease

Duration	Number (Percentage %)	Average
1 day	2(5.55%)	4.6±1.45
2 day	7(19.44%)	
3 day	8(22.22%)	
4 day	7(19.44%)	
5 day	8(22.22%)	
6 day	1(2.77%)	
7 day	3(8.33%)	

Table 4: Status of Baseline data

Symptoms	Number (Percentage %)
Temperature	
Up to 100 º F	0(0%)
101 º F	9(25%)
102 º F	15(41.66%)
103 º F	12(33.33%)
104 º F	0(0%)
Spleen enlargement	
palpable	8(22.22%)
Not palpable	29(80.55%)
Headache	
Absent	2(5.55%)
Mild	10(27.77%)
Moderate	24(66.66%)
severe	2(5.55%)
Stages of fever	
Only chill	0(0%)
Only heat	10(27.77%)
Chill followed by heat	21(58.33%)
All stages prominent	4(11.11%)
Body and muscle ache	
Absent	3(8.33%)
Mild	21(58.33%)
Moderate	13(36.11%)
severe	0(0%)
Perspiration	
Absent	0(0%)
Mild	12(33.33%)
Moderate	22(61.11%)
severe	3(8.33%)
Fatigue	
Absent	3(8.33%)
Mild	20(55.55%)
Moderate	13(36.11%)
severe	0(0%)
Nausea & vomiting	
Absent	7(19.44%)
Mild	8(22.22%)
Moderate	24(64.661%)
severe	0(0%)

Among total 36 malaria positive patients, Majority of patients (41.66%) having temp 102º F. Spleen was palpable only in 8 patients. (22.22%) Mild Body & muscle ache was present in 21 patients. (58.33%). Moderate perspiration and Mild Fatigue was present in 22 patients.(61.11%) and 20(55.55%)Respectively. Nausea and vomiting was present in 13(36%) patients.

Table 5: Malaria symptom score and laboratory findings at entry

Investigations	Mean ± SD (At entry)	Mean ± SD (At End)	P Value
WBC count	8541.9±1455.3	7641.9±1350.2	0.958
Neutrophil	63.3±4.2	58.3±3.0	0.586
Lymphocyte	30.9±3.0	33.3±4.1	0.495
Monocyte	0.9±0.3	1.2±0.1	0.332
Eosinophil	6.1±2.2	4.3±1.9	0.565
Hb	10.2±1.9	10.4±2.1	0.856
ESR	24±2.5	14±2.2	0.04*
MSS score	12.2±1.6	6.9±3.4	0.001**

The mean MSS score at the starting was 12.2±1.6 and the end of the treatment it became 6.9±3.4 (p<0.05). ESR value also reduced and it showed statistically significant results (Table 5).

Table 6: Medicine used and the Improvement status of Malaria

Medicine used	No of case (%)	Improvement status	
		Cured	Not cured
Ipecac	2(5.55%)	0	2
Nyctanthus arb.	2(5.55%)	2	0
Nat.mur.	8(22.22%)	2	6
Ars. Alb.	12(33.33%)	7	5
Rhus tox.	4(11.11%)	1	3
China	5(13.80%)	2	3
Gelsemium	3(8.33%)	0	3

Most frequently prescribed medicines as per indications were *Arsenicum album* (n=12, 33.33%), *Natrum muriaticum* (n=8, 22.22%), *China Officinal is* (n=5, 13.80%), *Rhus toxicodendron* (n=4, 11.11%), Ipecac (n= 2, 5.5%), Gelsemium (n=3, 8.33%), Nyctanthus (n=2, 5.55%).

Discussion

One of the earliest recognized illnesses in human history is malaria. Despite considerable advancements, the illness continues to be a major contributor to widespread ill health in many tropical regions. [8] 212 million cases of malaria were recorded globally in 2015 alone, although between 2010 and 2015, the incidence of malaria decreased globally by 21%. In 2010 and 2015, the malaria-related death rate decreased to 29%. [9] With the exception of 2007, when malaria outbreaks occurred in India's north-eastern regions, prevalence, annual parasite incidence (API), and deaths from malaria have decreased during the past 1.5 decades. [10].

The World Health Organization has identified homoeopathy as one of the systems of traditional remedy that should be integrated with traditional prescription to ensure effective global health services. According to homoeopathy, a person's symptoms are their body's way of trying to heal itself and shouldn't be suppressed. Homeopathic treatments aid in enhancing the body's ability to modify and heal itself. It intervenes at the level of the individual's sensitive, self-healing powers with the goal of achieving a change in the overall way the body functions [11].

Homeopathy sees illness as a fundamentally disturbed process brought on by the particular side effects of damaging experts of the fundamental principle, as demonstrated by recognisable symptoms. According to the homoeopathic theory, pathogens are carriers of dynamic, distinct traits of distinct disease forces that can only affect the vitality of the defenceless living host in an appropriate domain, delivering comparing change in the capacity and structure of the host's physical body, all of which are referred to as specific diseases [12]. Given that it focuses more on the teleology of the patient's reaction than it does the cause of the sickness, the homoeopathic approach may be particularly useful. As a result, many homoeopaths do not consider it as an optional method, but rather as a valid form of pharmaceutical use. Homeopathy has recently made advancements in clinical, physical, material, natural, and restorative levels with sufficient logical criteria since the season of its debut to the globe. Homeopathy drugs have been approved for their lack of side effects and comfort, and they have been evaluated for their acceptable qualification as potent anti-malarial. This study provides insight into the history of old-fashioned homoeopathy, which was based on experiments with living cells and subcellular structures. [13]

In Boericke Material Medical, *Nat. mur*. *Ars.alb*., Gels., *Ipecac*., and *China* are mentioned as 1st-grade medicines and *Rhus toxicodendron* has been mentioned as 2nd-grade medicine for malarial fever [14]. *Natrum muriaticum*, *Arsenicum album*, *China officinalis*, and *Ipecac* are also mentioned in Synthesis Repertory Homoeopathic under the rubric “malaria” in chapter “Generalities” [15].

Arsenicum album and Natrum Muriaticum are referenced in Kent's Repertory's chapter "Fever" [16] in the first grade under the heading "intermittent fever." Under the heading "intermittent fever" in the chapter "fever," Arsenicum album, Natrum Muriaticum, Ipecac, and China are listed as first-grade medications, and *Rhus toxicodendron* and Gelsemium are listed as second-grade medications [17]. The parasite has become resistant to traditional anti-malarial medications, thus they are no longer effective [18]. Malaria mortality has sharply increased in correlation with chloroquine resistance. The probability of malaria death among children aged 0 to 9 years has increased by 2.1, 2.5, and 5.5 times, respectively, since the establishment of chloroquine resistance [19].

There is an urgent need to assess the role of homoeopathy in the treatment of malaria given the rising resistance to treatment options and the scant scientific evidence supporting their efficacy. In underdeveloped nations like India, homoeopathic therapy may also be a superior option due to its affordability.

Conclusion

This investigation leads us to the conclusion that homoeopathic medicine is effective and secure for treating malaria. In several respects, it bolsters the idea that homoeopathy is a form of individualized therapy. Controlled studies must be done to verify the efficacy of homoeopathic malaria therapies.

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How to Cite This Article
Mangukiya R, Joshi N, Goti H. Original research article: Study of effectiveness of homeopathic remedies in treatment of malaria. International Journal of Homoeopathic Sciences. 2023;7(1):474-478.