Environment Conservation Journal 19 (3) 31-36, 2018
ISSN 0972-3099 (Print) 2278-5124 (Online)
Abstracted and Indexed

Effect of Siddharthakadi Agada in the Management of Malaria (Jwara)

Shukla D. Gyanendra[1]✉, Versodiya R. Rimpal[2], Thakar B. Anup[3] and Choudhary Kshiteeja[4]

Received: 25.06.2018 **Revised: 28.09.2018** **Accepted: 14.11.2018**

Abstract

Malaria is a vital parasitic disease of human for centuries, despite the control programs in many parts of the world. Picture of malaria is similar to the symptoms of the Kitadamsha, which leads to Tridosha Prakopa. Siddharthakadi Agada is an anti poison formulation to treat malaria. For present study, total 23 patients of malaria (P.vivax) were divided into 2 groups. Siddharthakadi Agada (Group A) 13 patients and modern medicine (Group B) 10 patients were registered. Complete remission in 20% of patients and marked improvement in 80% of patients was observed in trial group where as control group showed marked improvement.

Key words: Anti Poison, Kitadamsha, Malaria, Parasitic Disease, Siddharthakadi Agada, Tridodha Prakopa.

Introduction

Malaria is one of the most widespread diseases in the world, especially in tropical and subtropical regions. Malaria is caused by a tiny parasite called Plasmodium. Despite the introduction of control programs in many parts of the world over the past few decades, the impact of malaria on human population continues to increase. In 2016, an estimated 216 million cases of malaria occurred worldwide, compared with 237 million cases in 2010 and in 2016 there were an estimated 4, 44,500 deaths from malaria globally, compared to 4, 46,000 estimated deaths in 2015(WHO 2017). In the ancient time also malaria was a dreadful disease with its epidemic nature. Causes of the resurgence of malaria are chloroquine resistant vivax and insecticide resistance of the mosquitoes. Traditional medicines have been used to treat malaria for thousands of years. In recent years, chloroquine-resistant P.vivax malaria has been reported. Malarial drug resistance increases morbidity and mortality. The numbers of new antimalarial are restricted due to lack of investment by the pharmaceutical industry. With the problems of increasing levels of drug resistance and difficulties in poor areas of being able to afford and access effective antimalarial drugs, traditional medicines could be an important and sustainable source of treatment. Signs and symptoms of *Visha Kitadamsha* described by *Acharya Sushruta* are much similar to that of malaria. Various types of *Agada*, *Mantra*, *Dhoopa*, etc., are used for the treatment of *Visha* (*Sushruta*). *Siddharthakadi Agada* is an anti-poison formulation and used to treat *Visha*, *Jwara*, *Unmada*, etc. Almost all the ingredients of *Siddharthakadi Agada* have *Krimighna*, *Jwaraghna* and *Vishaghna* properties. Other properties are *Pleehaghna*, *Deepana*, *Pachana*, *Ruchikara*, *Sveadajanana*, *Raktashodhaka*, *Kasahara*, *Yakritottejaka*, *Dahashamaka*, *Trishahara*, etc. are very useful to treat malaria. So this formulation was selected for the present study.

Author's Address

[1]Department of Panchakrma, Uttarakhand Ayurved University Rishikul campus, Haridwar, Uttarakhand India 249401.

[2&3]Department of Kayachikitsa, IPGT & RA, Gujarat Ayurved University, Jamnagar, Gujarat, India – 361 008.

[4]National Institute of Ayurveda, Jaipur, Rajasthan, India-302002.

E-mail.: *dr.gdshukla@gmail.com*

Material and methods

Aims & Objectives

1. To study the etiopathogenesis of malaria in the parlance of *Jwara* and other *Ayurvedic* concepts.

2. To evaluate the effect of *Siddharthakadi Agada* in the management of malaria (*Jwara*).

Patients were selected from O.P.D. and I.P.D. of I.P.G.T. & R.A., G.G.S. hospital and C.H.C. of Jamnagar district. All patients were randomly selected irrespective of age, sex, religion etc. A specific proforma was prepared and the patients of the present study were examined in detail as per proforma. Haematological investigations like M.P test, T.L.C., D.L.C., Hb, E.S.R & Urine examination were carried out before and after treatment to rule out the other associated pathology as well as to assess and evaluate the effect of therapy. Patients with clinical picture of malaria and in blood smear positive for 'P.vivax' were taken in the study. Child below 5 years of age, Pregnancy, Febrile illness other than malaria and patient suffering from any other serious systemic illness were excluded. If and when any allopathic anti-malarial drug administered prior or during clinical trial then patient was excluded from the study. After proper scrutiny, patients were registered in the study. In the trial group 10 patients were given trial drug Siddharthakadi Agada (S.A.). The control group comprised of 10 patients and was administered modern medicine (Radical Treatment for P.vivax). The duration of treatment in trial group was 7 days and in modern medicine group was 5 days. All patients were randomly selected irrespective of age, sex, religion etc. A specific proforma was prepared and the patients of the present study were examined in detail as per proforma. Haematological investigations like M.P. test, T.L.C., D.L.C., Hb, E.S.R., Urine examination were carried out before and after treatment to rule out the other associated pathology as well as to assess and evaluate the effect of therapy.

Statistical analysis: The information gathered on the basis of classical symptomatology was subjected to statistical analysis in term of mean (X), standard deviation (SD) and standard error (SE). Paired't' test was carried out at $P<0.05$, $P<0.01$, $P<0.001$ significance level. The obtained results were interpreted as insignificant - $P>0.05$, significant - $P<0.05$ and highly significant - $P<0.01$, $P<0.001$.

Results and Discussion

Resistance to antimalarial drugs has been described for two of the four species of malaria parasite that naturally infect humans, P. falciparum and P. Vivax. P. falciparum has developed resistance to nearly all antimalarial in current use, although the geographical distribution of resistance to any single antimalarial drug varies greatly (Murphy GS et al.). P. vivax infection acquired in some areas has been shown to be resistant to chloroquine and/or primaquine (*Looareesuwan S et al 1997*). In *Ayurveda Agada* (antidote) is used to treat *Visha*. Indications of *Siddharthakadi Agada* include *Jwara* and *Visha*. Almost all the ingredients of *Siddharthakadi Agada* are having *Jwaraghna, Vishaghna* and *Krimighna* properties. Other properties like *Vishama Jwaraghna, Yakritottejaka, Pleehaghna, Deepana, Pachana, Ruchikara, Raktashodhaka, Dahashamaka* etc. are very useful to treat signs and symptoms of malaria.

In the present study 23 patients of malaria were treated in two groups. Maximum numbers of patient belonged to the age group 6-15yrs and 16-25yrs equal number (30.43%) (WMR,2005). Other references also show that child and young people are more prone to malaria. Over 3 billion people live under the threat of malaria. It kills over a million each year – mostly children. In particular, young children, pregnant women, and non-immune visitors to malarious areas are at greatest risk of severe or fatal illness. WHO estimates that more than 90% of the 1.5 to 2.0 million deaths attributed to malaria each year occur in African children. In present study 65.22% affected patients were males. Male (SPR 17.5%) suffered relatively more than female (SPR 14.7%) (Prakash *et al.*,2000). Males are more frequently affected because of outdoor life. Females in India are more clothed than males which reduce their exposure. In the present study, Maximum numbers of patients (73.91%) were having primary level education. Because of less awareness about health care in ill-literate or less educated may increase incidence of the disease.

All the patients were having *Alasya, Klama, Asyavairasya, Sheetanubhuti, Sveda Apravartana, Aruchi, Romaharsha, Angamarda, Varnahani* and *Avipaka. Trishadhikya, Arati* and *Gaurava* were found in 95.65% patients while *Jagarana* and *Sabda Asahatva* in 60.87% patients. *Ashrupurnanetra* and *Pindikodveshtana* were observed in 91.30% patients. 65.22% patients were

having excessive *Jrimbha* while *Nidradhikya* was present in 39.13% patients. *Dantaharsha* and

Table 1: Drug *(Siddharthakadi Agada)*: Contents of drug

Drugs	**Botanical Name**	**Part used**	**Praportion**
Siddharthaka (*Sarshapa*)	Brassica *campestris*	Seed	1 Part
Vacha	Acorus *calamus*	Root	1 Part
Hingu	Ferula *foetida*	Niryasa	1 Part
Karanja	Caesalpinia *crista*	Seed	1 Part
Devdaru	Cedrus *devdaru*	Stem	1 Part
Manjistha	Rubia *cardifolia*	Root	1 Part
Haritaki	Terminalia *chebula*	Fruit	1 Part
Bibhitaka	Terminalia *bellirica*	Fruit	1 Part
Amala	Emblica *officinalis*	Fruit	1 Part
Shweta(*Aparajita*)	Clitoria *ternatea*	Root	1 Part
Katabhitwaka (*Shwetashirisha*),	Albizzia *procera*	Bark	1 Part
Sunthi	Zingiber *officinale*	Rhizome	1 Part
Maricha	Piper *nigrum*	Fruit	1 Part
Pippali	Piper *longum*	Fruit	1 Part
Priyangu	Callicarpa *macrophylla*	Flower	1 Part
Shirisha	Albizzia *lebbeck*	Bark	1 Part
Haridra	Curcuma *longa*	Rhizome	1 Part
Daruharidra	Berberis *aristata*	Stem	1 Part
Basta Mootra	Male Goat Urine		As required

Table 2: Effect of therapies on various signs and symptoms of Malaria

Signs and symptoms	**N**	**Siddharthakadi Agada (X±S.E)**		**Radical treatment (X±S.E)**
Rigor with chill	n=10	2.4±0.221**	n=10	2±0.210**
Fever	n=10	2.4±0.221**	n=10	2.4±0.163**
Headache	n=10	1.5±0.166**	n=10	1±0.210**
Vomiting	n=3	1.66±0.333*	n=5	1.6±0.244**
Body ache	n=10	1.8±0.133**	n=10	1.3±0.213**
Sweating	n=10	2.1±0.179**	n=10	1.9±0.233**
Anorexia	n=10	1.9±0.100**	n=10	1.1±0.1**
Weakness	n=10	1.6±0.163**	n=10	0.9±0.1**
Cough	n=6	1.75±0.250**	n=3	1.66±0.333*
Abdominal Pain	n=5	0.5±0.223	n=4	0.4±0.163
Hb%	n=10	0.19±1.665	n=10	0.4±0.244
ESR	n=10	3.5±0.833**	n=10	1.8±1.103

Pralapa were observed in 04.35% patients. Tikshnavisha Kitadamsha Lakshana**:** In the present study all the patients were having *Jwara* (fever), Angamarda (body ache), Romancha (horipillation), Daha (burning sensation all over the body), Sheeta (chill) and Vepathu (rigor). Maximum numbers of patients i.e. 95.65% were having Trisha. Chhardi (vomiting) and Jrimbha were observed in 34.78% and 69.56% respectively. Mandavisha Kitadamsha Lakshanas like Shirogaurava (headache), Arochaka (anorexia), Sheeta (chill), and Praseka (nausea) were found in all the patients while Chhardi (vomiting) was found in 34.78% patients. In present study, *Jwaravega Kala* was found in 52.17% patients at evening, in 39.13% patients at morning and in rests of 08.70% patients at noon. According to *Doshaprakopa Kala*, evening is favourable time for *Vataprakopa* and morning for *Kaphaprakopa* (Pandit Hari Sadasiva, 2002) so it can be said that P.vivax malaria is *Vatakapha* dominant. Chief

complaints like rigor with chill, Fever, Headache, Body ache, Anorexia and Sweating were observed in 100% patients while vomiting was found in 34.78% patients. Associated complaints were observed with weakness. 39.13% patients were suffering from cough. Splenomegaly and hepatomegaly were found respectively in 21.74% and in 17.39% patients. Abdominal pain was found in 39.13% patients. According to *Acharya Sushruta Pleehavriddhi* (Splenomegaly) due to *Medokshaya* and he also mentioned that *Tritiyaka Jwara* is *Medo Aashrita*. E.S.R. was decreased by 19.12% in trial group and by 11.84% in Radical Treatment. Properties of the drugs of *Siddharthakadi Agada* like *Raktadoshahara, Vishaghna, Amapachana, Jantughna, Yakritottejaka, Pleehaghna* etc. and pharmacological activities like carminative, anti-inflammatory, insecticidal, blood purifier, hepatoprotective were useful to decrease E.S .R. In malaria, monocyte count increases because of malarial toxins. Decreased monocyte count (by 16.41%) in trial group indicates anti-malarial activity of *Siddharthakadi Agada*. No marked improvement was found in Hb value because of duration of seven days treatment.

PS for P.vivax: After seven days treatment blood smear found negative for P.vivax indicate antiprotozoal activity of the drugs of Siddharthakadi Agada. Many of the drugs of *Siddharthakadi Agada* are having antimalarial, antimicrobial, anti-inflammatory, anthelmintic, antiprotozoal, hepatoprotactive, etc pharmacological activities and *Krimighna, Vishaghna, Jantughna, Raktadoshahara, Yakritottejaka, Pleehaghna* etc. properties which might be the reason behind the clearance of parasite from the blood. In both groups 100% relief was found in rigor with chill, fever, vomiting and sweating. Most of the ingredients of *Siddharthakadi Agada* are having *Jwaraghna, Chhardinigrahana, Amahara, Pachana* etc. properties and antipyretic, anti-emetic pharmacological activities which are effective on fever and vomiting. In headache 62.50% ($p<0.001$) relief was found in trial group (S.A) while 41.67% ($p<0.01$) in control group because of *Shoolprashamana, Vedanasthapana, Srotorodhahara* etc properties and analgesic, antiinflammatory, antioxidant etc pharmacological activities. 64.29% ($p<0.001$) relief in body ache was observed in trial group (*Siddharthakadi Agada*) and control group it was 52%. In anorexia 76% improvement found in trial group while it was 39.29% relief in control group. Drugs of *Siddharthakadi Agada* are having *Deepana*; *Pachana* properties which increase *Agni* and thus *Pachanakarma* (improve digestive power). Both groups showed statistically highly significant results in rigor with chill, temperature, body ache, sweating, anorexia and headache. In vomiting both groups showed 100% relief but statistically significant in trial group while highly significant ($p<0.01$) in control group. All these effects are may be due to anti-malarial effect of the drugs *Siddharthakadi Agada.*

Regarding the associated symptoms both the groups showed highly significant result in weakness. But percentage wise 57.14% relief in trial group (*Siddharthakadi Agada*) while it was 36% in control group. *Deepana, Pachana* etc. properties improves digestion which facilitates nourishment to body tissue and ultimately helps to decrease weakness. Cough was relieved by 100% in Group A and by 83.33% in Group B. Statistically it was highly significant in trial group (*Siddharthakadi Agada*) but significant in control group. A *Kasahara* property and cough suppressor pharmacological activity might have worked and provided relief in cough. In abdominal pain 83.33% relief was found in trial group and 80% in control group but statistically it was insignificant in both groups. On comparison with control group, the trial group showed more beneficial results in managing the anorexia; headache and body ache because of its *Deepana, Pachana, Shoolaprashamana, Balya, Vedanasthapana* etc. properties. On the comparison of the therapeutic observation collected from study showed that effect on headache was 62.50% in Group A and 41.67% in Group B. In the body ache 64.29% relief was observed in Group A while 52% in Group B. Anorexia was relieved by 76% in Group A and 39.29% in Group B. Effect on weakness was 57.14% in Group A and 36% in Group B. Abdominal pain was relieved by 83.33% in Group A and by 80% in Group B. In cough 100% relief was found in Group A and 83.33% in Group B.

Probable mode of action: Ingredients of S.A. are having *Vishaghna, Krimighna, Pleehaghna, Jwaraghna, Deepana, Pachana, Ruchikara, Raktashodhaka, Chhardinigrahana, Dahashamaka*

etc. properties. Ingredients of S.A. are having Tikta *Rasa, Katu and Kashaya Rasa. Katu, Tikta* and *Kasaya Rasa* increases *Agni* and treats *Mandagi*, and *Agnimandya* is always present in any types of *Jwara*. So ultimately it dissolves *Ama* and increase *Kshudha*. S.A. with its *Tikta Rasa* pacifies the *Pitta* predominance of *Jwara*, as well as initiates *Amapachana* and increases the appetite. *Bast Mutra* also having *Katu, Tikta Rasa*. After completion of schizogony when RBC rupture it release toxin (malaria toxin) with merozoites which is answerable for most of the pathological changes in malaria. In *Ayurveda Ama* is responsible to produce *Jwara* (fever) and named *Visha* (toxin) by *Acharya Vagabhatta*. So with the help of *Vishaghna* property of S.A. it might be acting on malarial toxin and reduces and removes the effect of malarial toxin. All the microorganisms can be considered under '*Krimi'* word in *Ayurveda* and malarial parasite is unicellular microorganism which is responsible to produce disease in human being. Therefore parasite is a one type of *Krimi*. *Achcrya Vagabhatt* described character of *Raktaja Krimi* as *Sukshma, Apada* etc which is similar to malarial parasite. *Krimighna* properties of S.A. act on malarial parasites and may destroy it. *Jwara* is one character of *Visha Kitadamsha Lakshana* and *Jwaraghna* property act on malarial toxin which is released with merozoites after completion of schizogony. These toxins are responsible to produce various types of cytokines which acts on TRC and set it at higher level. When malarial toxins reduce, again TRC set at normal body temperature. In Ayurvedic text *Jwara* occurs because of *Ama* (Visha -toxins). In this way *Jwaraghna* property of the drugs of S.A. act on malaria. Ushna *Veerya* of drugs of S.A. imports *Svedana* and *Vilayana* properties to *Ama*, thereby hindering chances of *Srotorodha*. It becomes more effective with the *Laghu-Ruksha-Tikshna Guna* and *Katu Rasa*. These properties remove obstruction from *Rasa* and *Sveda vaha Srotas* and decrease temperature. *Latakaranja, Haridra, Daruharidra, Bibhitaka, Pippali, Maricha and Shirisha a*re having antimalarial pharmacological activities. Ingredients of S.A. are also having other pharmacological activities like hepatoprotective, antipyretic, antimicrobial, carminative, hypothermic, anthelmintic, analgesic, anti-inflammatory, blood purifier. *Jwara* a manifestation *of Rasavaha Srotorodhajanya Vyadhi* needs a *Deepana, Pachana, Srotosodhana*, qualities for its relief. *Siddharthakadi Agada* is the best combination of *Deepana* and *Pachana* drugs which properly potentates the *Agni* thereby facilitating *Aaharapaka* as well as *Dhatupaka* at *Jatharagni* and *Dhatwagni* levels. In malaria because of decreased flow of digestive enzymes in to stomach digestion is not properly done. *Deepana Dravya* increases *Agni* and *Pachana* property improves digestive action. *Pippali* is a good catalyst agent enhances the absorption and assimilation of drug (S. Chhajed et al 1990). After penetrating 3 or 5 hepatocytes sporozoites success to come into a hepatocyte. Need of suitable state of hepatocytes is necessity for invasion. Hepatoprotective (*Yakritottejaka*) properties act on hepatocytes. Relapse occurs because of remaining merozoites in hepatocytes. *Yakritottejaka* action may create such condition which is not favourable for hepnozoites. In malaria Splenomegaly is common and *Pleehaghna* properties of drug acts on spleen and thus helps to treat Splenomegaly.

Conclusion

Siddharthakadi Agada is having *Vishaghna, Krimighna, Jwaraghna, Yakritottejaka, Pleehaghna and Raktashodhaka* etc. properties. *Siddharthakadi Agada* removes P.vivax from the blood after seven days treatment. It is more effective in anorexia, headache and body ache than Radical treatment. *Siddharthakadi Agada* has provided statistically highly significant results in fever, rigor with chill, headache, body ache, sweating, anorexia, weakness and cough. Any side effect has not been observed during and after its clinical trial. In nutshell it can be concluded that *Siddharthakadi Agada* can be a potent anti-malarial drug. However, this study was carried out on very small scale and single blind, so large scale and double blind study in this direction is needed which may lead to opening of the new horizon.

References

Sharma Acharya priyavat, Sharma Anantram 2004. Sushruta Samhita, revised by Sushrutavimarshini Hindi commentary. Vol.II, Kalpasthana 8th chapter, 17th sloka, Sutrasthana15/13,

Prakash Anil, Mahapatra P.K., Bhattacharya, D.R., Sharma,C.K., Goswami, B.K., Hazarika,N.C. Mahanta, J.,

2000. Epidemiology of malaria outbreak; Apr/May, 1999 in Titabor PHC, district Jorhat, Assam, Indian J Med Res 111:121-126

http://rbm.who.int/wmr2005/htm/toc.htm;27/02/2006

Looareesuwan, S., Buchachart, K., Wilairatana, P., Chalermrut, K., Rattanapong, Y., Amradee, S., Siripiphat, S., Chullawichit, S., Thimasan, K., Ittiverakul, M., Triampon, A., and Walsh, D. S., 1997. Primaquine-tolerant vivax malaria in Thailand. ***Annals of Tropical Medicine & Parasitology***: 91:939-943.

Murphy, G.S., Basri, H., Purnomo, Andersen, E.M., Bangs, M.J., Mount D.L., Gorden, J., Lal A.A., Purwokusumo, A.R., Harjsuwarno S., 1993. Vivax malaria resistant to treatment and prophylaxis with chloroquine.; 341:96 100; 45.

Pandit Hari Sadasiva Sastri Paradakara Bhisagacarya 2002. Hridaya with the commentaries, Sarvangasundara of Arundatta and Ayurveda Rasayana of Hemadri, 9th Ed, 2002. NidanaSthana 1/11.

Trivikram armaja yadav Sharma , 2006 Agnivesha,Charaka Samhita, revised by Charaka and Dridhbala with 'Ayurveda Dipika' commentary by Chakrapanidatta, vol. 2 Chikitsasthana 9th chapter 69th sloka. P. No.72

www.who.int/malaria/cmc_upload/0/000/015/040/table1.gif; 26/02/2006

WHO, 1993. World malaria situation, part I. ***Weekly Epidemiological Record***; 71:17- 22

WHO, 2017. World malaria report, ISBN: 978 92 4 156552 3. P. no. 15-16