

# Management of *Uthiravathasuronitham* (Rheumatoid arthritis) by Siddha traditional formulation *Amirdha Gandhi Kukkil Vallathy* – A case series

## Case Report

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## Abstract

**Aim and Objectives:** Rheumatoid arthritis is an auto immune disease and its signs and symptoms are correlated with *Uthira vatha Suronitham* (UVS) in Siddha. Here we discussed a case series of Rheumatoid arthritis managed by a novel, classical Siddha formulation *Amirdha Gandhi Kukkil Vallathy* (AGKV). **Methods:** Three cases were diagnosed as Rheumatoid arthritis (RA) based on ACR/EULAR 2010 criteria, along with symptoms of UVS as per Siddha literature. All the three cases were treated with Siddha medicine AGKV 2 gm bid for 48 days in the General out patients department, Siddha Central Research Institute. **Observations:** The assessment was made by the signs and symptoms and serological parameters like C-Reactive protein (CRP), Erythrocyte Sedimentation Rate (ESR), Haemoglobin (Hb), Rheumatoid Arthritis factor (RA factor). **Results:** The RA Factor was reduced in all three patients from 60 to 13.9, from 133 to 106, from 60.7 IU/ml to 35.6 IU/ml ; CRP reduced in case 1 from 135.8 to 34.3, case 3 from 18.9 to 5.6, reduction in RAPS score and clinical symptoms were noticed in all three cases and were followed for 1 year and managed with diet advice. This case series highlights that RA can be successfully managed with Siddha herbo mineral preparation AGKV within a minimum period of 48 days. Hence in a long duration of treatment, it will certainly give good results to reduce the burden of RA patients.

**Key Words:** *Amirdha Gandhi Kukkil Vallathy, Rheumatoid Arthritis, Siddha Medicine, Uthira vatha suronitham.*

## Introduction

In Siddha system of medicine the diseases are broadly classified into *vatham*, *pitham* and *kapam* diseases based on derangement of three *thodam* (three vital forces when affected). There are eighty types of *Vatham* diseases explained in Siddha which occur due to vitiation or reduction of *vatham*. According to *Siddhar Yugi*, *Uthira Vaatha Suronitham* is one of the 80 types of *Vatham* diseases. It is characterized by swelling in ankle joint, knee joint and other joints with intensity of the disease in smaller joints of fingers. Less food intake, weakness, mental confusion will be the associated symptoms (1). These signs and symptoms of *Uthira Vaatha Suronitham* are clinically correlated with the disease of Rheumatoid arthritis.

Rheumatoid arthritis (RA) is a chronic auto immune disease, affecting the female more than male at least twice in ratio and the peak incidence is at 50 years(2). RA affects the joints causing symptoms of pain, stiffness, swelling, and limitation of joint movement. Most of the RA patients have a slow onset of the disease, some with acute onset of polyarthritis. Some patients present with polyarthritis of very acute onset, but a gradual and insidious onset is more common (3). A case was reported that after taking Methotrexate for 12 weeks, after 5 years of treatment with disease-modifying antirheumatic drugs (DMARDs) had been complicated with Pancytopenia. Methotrexate is the effective drug used to treat RA nowadays but it causes complications(4). Hence early diagnosis of this disease and early treatment may contribute a cost effective, promising treatment regimen for an effective disease modification(5,6). The popular criteria to diagnose RA are American College of Rheumatology (ACR) / European League against Rheumatism (EULAR). The early arthralgia patients can also be screened by the ACR/ EULAR classification of Diagnostic criteria and able to start drug effectively (7).

*Serankottai* (SA nuts) is administered in different forms of medicines in Siddha and achieved good

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prognosis in the management of *Uthira vatha suronitham* since it has been mentioned as an equivalent plant drug to the efficacy of mercury which is the prime drug in Siddha(8). *Nandhi mezhugu*, *Serankottai nei*, *Serankottai legium* (9) *Amirdha Gandhi Kukkil* Vallathy(10) are some of the *serankottai* based medicines clinically used in treating the RA.

AGKV is a herbo mineral Siddha *Mezhugu* (which has waxy consistency) formulation, consisting of 39 ingredients, in which *Seendhil* (*Tinospora cordifolia*), *Gandhagam* (sulphur), *Kukkil*(*Shorea robusta*), *Vallathy*(*Semecarpus anacardium*) are the major ingredients. These major ingredients has promising anti inflammatory (11, 12,13) and immunomodulatory (14,15) effects. AGKV is mentioned in the Classical Siddha text *Agathiyar Vaithya vallathy* 600, which is classified in the Schedule 1 books list of Drugs and Cosmetics Act and it explains formulations based on the potent drug SA nuts. The immunosuppressive activity was well documented from the results of anti arthritic activity of *Semecarpus anacardium* by inducing adjuvant arthritis in rats and hence it has been proved for its efficacy in treating the disease(16). Crude ethanol extract of SA nuts was elucidated for its invitro anti inflammatory activity using peripheral blood and synovial fluid mononuclear cells of human subjects by suppressing LPS induced NF-κB and AP-1(17). Hence AGKV is the drug of choice since, it is indicated for *vatha noigal* 80 - Z (80 vatha diseases), *kai kaal mudangal*(immobilization of limbs), *pavuthiram* -RP (Fistula), *Yoniputtru* -PD (CA cervix), *Karapan* -BF (Eczema), uterine diseases(10). This present study is aimed at documenting the case series of three RA patients who were successfully managed with AGKV after getting their consent.

### Case series

Three RA cases were enrolled according to ACR/EULAR classification of Diagnostic criteria and after getting consent, described as per CARE guidelines.

According to individual's body constitution/physique, the body of human beings is classified on the basis of the nature of *vali*, *azhal*, *ayiam* into three types. The three *Uyirathukkal* (vital forces) dominate or control ones physical and psychological characters<sup>18</sup>. Hence the assessment of *udal iyal* is a mandatory in all patients before starting the Siddha treatment so as to develop the Treatment Regimen, Diet advice, and Life style modifications. *Udal iyal* assessment was done for the patients using the Siddha YI tool (18).

### Case -1:

A 72 yr old male having a body weight of 72 kg, a retired officer dwelling in urban area has multiple joint pains with stiffness and visited the Out patients Department, Siddha Central Research Institute for treatment in Siddha. He was suffering with severe pain in Meta carpo phallangeal joints of both hands with stiffness, pain and swelling in right knee joint and right ankle, difficulty in standing upright from sitting position. Sleep, appetite and all vitals were normal. The

patient was assessed as *Azhal udal* according to the YI tool.

The patient had pain in any of the joints with mild swelling and stiffness occasionally since 3 months. The pain was treated with non steroidal anti inflammatory oral drug and DMARD for the past one month. He came to the opd, SCRI for a better treatment since the patient was afraid of complications due to those medicines. The patient was worried with the side effects and dependency of the medications increased. There was no history of addiction/diabetic/hypertensive/fits.

When the patient came to our hospital he was diagnosed as *Uthira vatha suronitham* provisionally with the signs and symptoms as per the Siddha text *Yugi sinthamani*. However, to confirm the diagnosis, the blood investigations ESR, CBC, Hb, RA factor, ASO titer, CRP were taken. As per the 2010 ACR/EULAR criteria, he has scored 8/10 and confirmed as RA.

The patient has typical symptoms of RA and has been treated with AGKV, a herbo mineral formulation which is in practice and indicated for eighty types of *vatham* diseases. The drug was given in the dose of 2 gm bid daily for one *mandalam* (a course of 48 days). Before and after the period of 48 days, the tests were done and the drastic reductions in RA factor, CRP after treatment were recorded. The pain has been reduced and the patient is able to close his fingers in both hands. The mild swelling in the rt. Ankle also drains and the patient is able to stand from the sitting position and walk without pain.

The RA factor was reduced from 60 IU/ml to 13.9IU/ml and CRP reduced from 135.8 to 34.3, ESR and other blood parameters have no change.

### Case - 2:

A 41 yr female, a beautician visited the SCRI, OPD for arthritis. The patient had pain and swelling in both knee joints, both ankles, wrist and metacarpo phallangeal joints of both hands with morning stiffness for the past 5 months. Patient had no previous h/o fever, fits, DM, Hypertension. The patient was assessed as *Azhal udal* according to the YI tool.

As she had pain in multiple joints and morning stiffness which are the notable signs of RA, the patient was advised for investigations. The results of investigations confirmed the diagnosis. As per the 2010 ACR/EULAR criteria, she has scored 9/10 and confirmed as RA.

Then the patient was administered with AGKV, twice a day for 48 days at a dose of 2 gm with water. After 48 days the symptoms were gradually decreased, swelling in ankles was reduced, able to close the fingers of hands. The mild swelling in both knees reduced with reduction in pain. The patient felt better after treatment and could do the routine works with no pain in joints. Again the blood investigations were done after 48 days of treatment. The RA factor was reduced from 133 IU/ml to 106 IU/ml and CRP, ESR and other blood parameters show no difference.

### Case - 3:

A 32 yrs old female who was doing her tailoring work in house, came to the opd with symptoms like pain and swelling in minor joints of both hands, pain and swelling in both ankle joints and morning stiffness more than 1 hour. She could not do her daily activities like cutting vegetables, rotating the bottle lids and tailoring. Patient had no previous h/o fever, fits, DM, Hypertension. The patient was assessed as Azhal udal according to the YI tool. As she had the symptoms of RA clinically, she was advised to take investigations. The results of investigations confirmed the diagnosis. As per the 2010 ACR/EULAR criteria, she has scored 9/10 and confirmed as RA.

We planned to give AGKV for 48 days and the medicine has been given in a dose of 2 gm bid with weekly once visit for clinical examination. After 48 days of medication, the patient felt better clinically, with nil pain in the finger joints and able to do all household works and tailoring work regularly. She felt occasional pain in ankles. Swelling reduced well. CRP reduced from 18.9 to 5.6 mg/l, ESR from 45 mm / hr to 20 mm, RA Factor 60.7 to 35.6 IU/ml. Liver function tests, Renal function tests and all other parameters became normal. Hence the medicine AGKV has reduced the symptoms of RA both clinically and hematologically.

**Table 1- Assessment of cases**

Assessment of RA patients				
	EULAR score	Investigations	Before treatment	After treatment
Case 1	More than 10 joints-5 points Low positive RA-2 points More than 6 weeks-1 points Total- 8 points	RA factor	60 IU/ml	13.9 IU/ml
		CRP	135.8	34.3
		ESR	20 mm	20 mm
		Hb	11.7	14.0
Case 2	More than 10 joints-5 points High positive RA-3 points More than 6 weeks-1 points Total-9 points	RA factor	133 IU/ml	106 IU/ml
		CRP	7.8	7.9
		ESR	41mm/hr	41mm/ hr
		Hb	12	12.4
Case 3	More than 10 joints-5 points Low positive RA-2 points More than 6 weeks-1 points Total-8 points	RA factor	60.7 IU/ml	35.6 IU/ml
		CRP	18.9	5.6
		ESR	45mm/hr	20 mm/hr
		Hb	12	13

**Table 2- Rheumatoid Arthritis Pain Scale questionnaire**

S.No	Pain Items	Possible range	Observed range					
			Case – 1		Case - 2		Case - 3	
			BT	AT	BT	AT	BT	AT
1	I would describe my pain as gnawing.	0-6	5	2	5	2	6	1
2	I would describe my pain as aching.	0-6	4	1	4	2	5	3
3	I would use the word exhausting to describe my pain	0-6	3	2	4	2	5	2
4	I would describe my pain as annoying.	0-6	4	2	4	2	4	1
5	I am in constant pain	0-6	5	3	5	2	5	1
6	I would describe my pain as rhythmic	0-6	2	2	1	1	2	1
7	I have swelling of at least one joint.	0-6	6	4	6	3	5	2
8	I have morning stiffness of one hour or	0-6	6	3	6	2	5	1
9	I have pain on motion of at least one	0-6	6	4	5	3	5	2
10	I cannot perform all the everyday tasks I normally would because of pain.	0-6	6	3	6	2	6	1
11	Pain interferes with my sleep.	0-6	5	3	5	4	4	2
12	I cannot decrease my pain by using methods other than taking extra	0-6	5	3	5	2	5	1
13	I would describe my pain as burning.	0-6	2	1	1	1	0	0
<b>Total</b>		<b>0-78</b>	<b>59</b>	<b>33</b>	<b>57</b>	<b>28</b>	<b>57</b>	<b>18</b>

BT – Before Treatment, AT – After Treatment

### Discussion

A significant reduction in the time duration of morning stiffness, joint pain score, swelling, tenderness, rheumatoid arthritis titer, CRP and the erythrocyte sedimentation rate was observed.

Rheumatoid arthritis (RA) is a chronic inflammatory disease of joint which results in Stiffness in various joints, destruction and deformity (19) and 1% of the population was affected by this disease. As it is an auto immune disease, the diagnosis and treatment in the early phase of the disease will benefit the patients to



get rid of symptoms (20). Hence the goal in treating Rheumatoid arthritis is to start the treatment earlier. By taking earlier treatment may mitigate the progressive course of RA (21). The involvement of joints particularly destruction of joints and remission of the disease can be prevented by treating the patients earlier (22). Early assessment of RA within 3 months showed 1.34 fold decreases in joint damage as compared with the patients assessed after 3 months (23). Sometimes we can diagnose RA on clinical symptoms. The early diagnosis of RA is accepted as the onset of clinical symptoms like poly arthritis, stiffness or swelling within 3 months of duration (24, 25). The 2010 ACR/EULAR classification will help for this earlier achievement of diagnosis than 1987 criteria (26).

In this case series three cases of different age, gender, and history have been diagnosed earlier and the treatment with AGKV reduced the symptoms of RA and there was observed a drastic reduction in morning stiffness, joint pain score, swelling, tenderness, rheumatoid arthritis titer, CRP and the erythrocyte sedimentation rate. Safety profile of the patients was assessed and no difference in serum bilirubin, SGOT, SGPT, alkaline phosphate, serum creatinine and blood urea.

Hence the case 1 which has been diagnosed earlier, has been treated successfully with AGKV and the case 2 which was chronic ie more than 3 months of duration, was symptomatically relieved yet the RA factor has slightly reduced at the end of treatment within one *mandalam* (48 days), case 3 has been diagnosed earlier and had treatment earlier, had good prognosis. But case 1 suffered a lot, yet he had not the RA factor as much as the case 2 (60 and 133) since the first case has age 72 / male, and the second with 41 yr/ female. It is predicted that even though the onset of the disease with comparatively low RA factor, the age of onset plays an important reason in the aggressiveness of symptoms. A study states that there was a notable difference in the disease activity score among the aged Elderly Onset Rheumatoid arthritis (EORA) and Younger- Onset Rheumatoid arthritis (YORA), where EORA has been defined as patients having onset of RA symptoms after the age of 60 or those having the disease continuously from younger age to elder age. Hence concern and treatment should be given to both age groups but due to the severity of the disease in elders, the treatment should be focused according to age (27,28,29). According to *Udal iyal* assessment in Siddha, among seven *udal thathukkal* bone, bone marrow, and muscle get affected in *azhal* body constitution. But, the *theyu* (fire) in *azhal udal* along with the medicine which has *veppa veeriyam*, neutralizes the increased *iyam* which is responsible for the inflammatory response in RA. The *azhal* body constitution may easily respond to the medicine and the burden of diseases is reduced. All the seropositive patients do not develop any adverse drug reaction and further development of complications since the purification of the drugs has been proved for reducing toxicity of the drug (30, 31). This drug also shows reduction in the Rheumatoid Arthritis Pain Scale

questionnaire score (RAPS) in all the three cases. All three cases were followed for one year and reduction in clinical symptoms were noted and this can be validated in further clinical trials.

Currently available NSAID s and DMARD s reduce inflammation but they are having side effects and affect the organs like liver. These drugs develop tolerance and therefore the dose is increased gradually (32). Hence the drug *Amirdha Gandhi Kukkil Vallathy* will be a safe and effective Siddha medicine to manage the symptoms in earlier phase of *Uthira vatha suronitham* (Rheumatoid arthritis).

## Conclusion

Hence Siddha drugs like AGKV can be validated further and can be used as a potential promising drug for the management of Rheumatoid arthritis.

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## References

1. Yugimuni Vaithya sinthamani-800. Rathna nayakkar and sons. 2 nd ed. Thirumagal vilasa achchu nilayam. 1969; 68p.
2. Silman A.J, Pearson J.E, Epidemiology and genetics of rheumatoid arthritis. Arthritis Res. 2002; 4; 265–272.
3. Van der Woude D, Van der Helm-van Mil AHM, Update on the epidemiology, risk factors, and disease outcomes of rheumatoid arthritis. Best Pract Res Clin Rheumatol .2018; 32; 174-187.
4. Sathi N, Dawson J. Methotrexate-induced pancytopenia associated with co-prescription of penicillin and trimethoprim. Clin Rheumatol. 2007 Jan ;26(1);134-5. doi: 10.1007/s10067-006-0423-y. Epub 2006 Aug 29. PMID: 16941195.
5. Van Nies JA, Krabben A, Schoones JW, et al. What is the evidence for the presence of a therapeutic window of opportunity in rheumatoid arthritis? A systematic literature review. Ann Rheum Dis. 2014; 73;861-70.
6. Van Nies JA, Tsonaka R, Gaujoux-Viala C, et al. Evaluating relationships between symptom duration and persistence of rheumatoid arthritis: does a window of opportunity exist? Results on the Leiden early arthritis clinic and ESPOIR cohorts. Ann Rheum Dis 2015; 74; 806-12.
7. Combe B, Landewe R, Daien CI, et al. 2016 update of the EULAR recommendations for the management of early arthritis. Ann Rheum Dis. 2017; 76; 948-59.
8. Murugaesa Mudhaliyaar KS, Materia Medica Gunapadam 1<sup>st</sup> Part, 3 rd ed. Chennai; Indian Medicine and Homeopathy Department; 1936; 489p.
9. Kuppasamy K.N, Uththamarayan K.S, Siddha vaithya thiratu, 5 th ed. Chennai; Indian Medicine and Homeopathy Department; 2006; 256p.

10. Veluchamy K, Agathiyar vallathy 600, Second ed. New Delhi; Central Council for Research in Ayurvedha and Siddha; 2005; 8p.
11. Sundaram R, Ayyakkannu P, Muthu K, Nazar SP, Palanivelu S, Panchanatham S. Acyclic Isoprenoid Attenuates Lipid Anomalies and Inflammatory Changes in Hypercholesterolemic Rats. Indian J Clin Biochem 2019; 34(4); 395-406.
12. Shrijani JK, Karunakar Hegde and AR Shabaraya, A Review on pharmacological activities of *Veteria indica* Linn. International Journal of Pharma and Chemical Research. 2018; (4) .
13. Philip S, Tom G, Vasumathi AV. Evaluation of the anti-inflammatory activity of *Tinospora cordifolia* (Willd.) Miers chloroform extract - a preclinical study. J Pharm Pharmacol .2018; 70(8); 1113-25.
14. Sannegowda KM, Venkatesha SH, Moudgil KD. *Tinospora cordifolia* inhibits autoimmune arthritis by regulating key immune mediators of inflammation and bone damage. Int J Immunopathol Pharmacol . 2015; 28(4) ; 521-31.
15. Ramprasath VR, Shanthi P, Sachdanandam P. Immunomodulatory and anti-inflammatory effects of *Semecarpus anacardium* Linn. Nut milk extract in experimental inflammatory conditions. Biol Pharm Bull. 2006; 29(4); 693-700.
16. Saraf M.N, Ghooi R.B, Patwardhan B.K. Studies on the mechanism of action of *Semecarpus anacardium* in rheumatoid arthritis. Journal of Ethnopharmacology .1989; 25(2) ; 159-64.
17. Singh D, Aggarwal A, Mathias A, Naik S. Immunomodulatory activity of *Semecarpus anacardium* extract in mononuclear cells of normal individuals and rheumatoid arthritis patients. J Ethnopharmacol . 2006; 108(3); 398-406.
18. Kannan Muthiah, Kiruthiga Ganesan, Manickam Ponnaiah, Sathiyarajeswaran Parameswaran. Concepts of body constitution in traditional *Siddha* texts: A literature review. Journal of Ayurveda and Integrative Medicine. 2019; 10 (2); 131-134.
19. Rabar D, Crozes P, Lernoud M, Meignan F. Large geodes in rheumatoid arthritis without joint destruction. Joint Bone Spine .2002; 69(6) ; 617-21.
20. Van der Woude D, van der Helm-van Mil AHM. Update on the epidemiology, risk factors, and disease outcomes of rheumatoid arthritis. Best Pract Res Clin Rheumatol. 2018; 32(2); 174-187.
21. Heidari, Behzad. "Rheumatoid Arthritis: Early diagnosis and treatment outcomes." Caspian journal of internal medicine. 2011; 2(1); 161-70.
22. Demoruelle, M Kristen, and Kevin D Deane. Treatment strategies in early rheumatoid arthritis and prevention of rheumatoid arthritis. Current rheumatology reports.2012; 14(5); 472-80.
23. Van der Linden MP, Boja R, Klarenbeek NB, Huizinga TW, van der Heijde DM. van der Helm-van Mil AH. Repair of joint erosions in rheumatoid arthritis: prevalence and patient characteristics in a large inception cohort. Ann Rheum Dis. 2010; 69; 727-9.
24. Kristen Demoruelle M, Kevin D. Deane, Treatment Strategies in Early Rheumatoid Arthritis and Prevention of Rheumatoid Arthritis. Curr Rheumatol Rep. 2012; 14; 472-80.
25. Aletaha D, Eberl G, Nell VP, Machold KP, Smolen JS. Attitudes to early rheumatoid arthritis: changing patterns: results of a survey. Ann Rheum Dis. 2004; 63; 1269-75.
26. Singh JA, Furst DE, Bharat A, et al. 2012 update of the 2008 American College of Rheumatology recommendations for the use of disease-modifying antirheumatic drugs and biologic agents in the treatment of rheumatoid arthritis. Arthritis Care Res. 2012; 64 ; 625- 39.
27. Tutuncu Z, Reed G, Kremer J, Kavanaugh A. Do patients with older-onset rheumatoid arthritis receive less aggressive treatment? Ann Rheum Dis. 2006; 65(9) ; 1226-9.
28. Van Schaardenburg D, Breedweld FC. Elderly-onset rheumatoid arthritis. Semin Arthritis Rheum .1994; 23; 367-78.
29. Kavanaugh AF. Rheumatoid arthritis in the elderly: is it a different disease? Am J Med .1997; 103; 40-8.
30. Lawrence J, Viswan Lilly R, Velmurugan A, Sundhara Moorthy KR, Sudarsanam SR, Parameswaran S, Kadarkarai K. Quantification of anacardic acid, the toxic component in raw and purified samples of *Semecarpus anacardium* L. by *Siddha* purification processes. J Complement Integr Med. 2021 May 19;19(4):947-953. doi: 10.1515/jcim-2021-0010. PMID: 34013671.
31. Juliet L, Karthik Raja S , Reena V L , Aarthi V , Sunil Kumar K N et al., Traditional methods of purification (detoxification process) for Schedule E poisonous drugs , Indian Journal of Traditional Knowledge. 2021;20(3); 740-748.
32. Verma RS, Khan P, Ayub S, Afza S, Akhtar J, Ahmad S and Khan AA. Efficacy and safety of a Unani compound drug-Habb-e-Asgand in Waja 'al-Mafasil (Rheumatoid Arthritis) cases-A preliminary study. Indian Journal of Traditional Knowledge 2021; 20 (1): 8-14.

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