A STUDY ON
UHIRA VATHA SURONITHAM
(RHEUMATOID ARTHRITIS)

Dissertation Submitted To

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DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation entitled **"A STUDY ON UTHIRA VATHA SURONITHAM"** is a bonafide and genuine research work carried out by me under the guidance of **Dr.A.S.POONGODI KANTHIMATHI, M.D(s).,** Professor, HOD, PG-III, Department of Sirappu Maruthuvam, Govt. Siddha Medical College, Palayamkottai and the dissertation has not formed the basis for the award of any Degree, Diploma, Fellowship or other similar title.

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S.NO	CONTENTS	PAGE NO
1	INTRODUCTION	1
2	AIM AND OBJECTIVES	3
3	REVIEW OF LITERATURE	
	Siddha Aspect	4
	Modern Aspect	27
4.	MATERIALS AND METHODS	50
5.	OBSERVATION AND RESULTS	55
6.	DISCUSSION	84
7.	SUMMARY	88
8.	CONCLUSION	90
9.	ANNEXURES	
	I. Preparation and Properties	91
	II. Bio-Chemical Analysis	107
	III. FTIR Analysis	110
	IV. Pharmacological Analysis	113
	V. Acute toxicity study	118
	VI. Assessment Forms	121
10	BIBLIOGRAPHY	142

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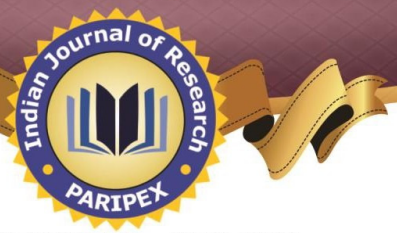

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Documents Filed	(1)Protocol (2)Data Collection Forms (3)Patient Information Sheet (4)Consent Form (5)SAE (Pharmacovigilance)
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Informed Consent Document	Yes
Any other Document	Case Sheet/Investigation Documents
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We approve the trial to be conducted in its presented form.

The Institutional Ethical Committee expects to be informed about the process report to be submitted to the IEC at least annually of the study, any SAE occurring in the course of the study, any changes in the protocol and submission of final report.

Chairman

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CERTIFICATE OF BOTANICAL AUTHENTICITY

Certified the following plant drugs used in Siddha formulation **KEEL VAYU NIVARANA CHOORANAM (INTERNAL) & VATHATHIRKU THYLAM (EXTERNAL)** for management of **UTHIRA VATHA SURONITHAM (RHEUMATOID ARTHRITIS)** taken up for post-graduation dissertation studies by **Dr.B.DURGA DEVI (REG.NO:321613002)** PG scholar, Department of Sirappu Maruthuvam are correctly identified and authenticated through Visual inspection / Organoleptic characters / Experience, Education & Training morphology, microscopical and taxonomical methods.

INGREDIENTS OF KEEL VAYU NIVARANA CHOORANAM

S.NO	DRUGS	BOTANICAL NAME	FAMILY	PART USED
1.	Parangipattai	*Smilax china*	Liliaceace	Root
2.	Nannari	*Hemidesmus indicus*	Asclepiadaceae	Root bark
3.	Seemai amukkura	*Withania somnifera*	Solanaceae	Root
4.	Chitarathai	*Alpinia officinarum*	Zingiberaceae	Rhizome

INGREDIENTS OF VATHATHIRKU THYLAM

S.NO	DRUGS	BOTANICAL NAME	FAMILY	PART USED
1	Manipungu	Sapindus emarginatus	Sapindaceae	Fruit rind
2	Erukku	Calatropis gigantea	Asclepiadaceae	Root bark
3	Murukkilai	Butea monosperma	Fabaceae	Leaf
4	Velai	Gynandropsis pentaphylla	Cleomaceae	Leaf

Station: Palayamkottai

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1. INTRODUCTION

Siddha system is a unique system of medicine because it is both spiritually and mentally enriched. Siddha system is one of the ancient system of Indian medicine. It evolved in south india and siddha medicine was developed by siddhars.

Prehistoric medicines incorporated plants (herbalism), animal part and minerals. In many cases these materials were used spiritually as magical substances by priests, shamans,or medicine men.

Our human body consist of 96 thathuvam,72000 nadi narampugal, 7 udal thathukkal, 3 uyir thathukkal and imbalance in these constituents leads to rogum.

The normal functioning of human body is based on homeostasis of 3 forces or 3 humors called **VATHAM, PITHAM** and **KABAM.**

Any derangements in this homeostasis lead to pathological condition called **PINI** or **NOI**

Siddhars classified the diseases in to 4448 types. Among that vadha disease are classified in to 84 types mentioned in yugi vadhiya cinthamani.In which uthira vatha suronidham is one among them and signs and symptoms of this disease is correlated with Rheumatoid arthritis in morden science.

Siddhars diagnosing the diseases by means of envagai thervu, nadi, and neerkuri, neikuri are the Precise diagnostic stool of siddhars. The treatment aspect involve the neutralization of affected humour.

A siddha physiciant kneely observe the naadi before starting any treatment. Hence unlike other system of medicines there does not exist only a symptomatic treatment in siddha. A strong relationship develops between the patients and physician. The physiciant not only heal the disease of the patient through medicines but also provide an assurance it his mind and prayer for the soul. Hence siddha system is unique when compared to any other system of medicine as it is both medicinally and spiritually enriched.

Now the merits and the advantages of siddha medical system is flourishing and awareness of siddha is progressing worldwide.

By giving purgatives, vatha kutram is neutralized. By giving emetics, pitha kutram is neutralized. By giving nasiyam kapha kutram is neutralized

RHEUMATOID ARTHRITIS is an autoimmune disorder which is world wide in distribution. About 0.5 - 3% seems to be affected. Women are affected 3 times

more than men. It is present from early childhood (when it is rare) to late old age, most common in 30-50 years.

It is the disease which causes much distress to the humanity at large. Till now there is no definite cure for this disease. Due to the prolonged and uncertain course of the disease and its prevalance the author planned to be conduct the study on **UTHIRAVATHA SURONITHAM**.

The author's choice of drug for clinical study were,

1. KEEL VAYU NIVARANA CHOORANAM- 10-20 gm twise a day internally
   [The pharmacopoeia of siddha research medicine. Page no 98]
2. VATHATHIRKU THYLAM - externally
   [Theraiyar vagadam.Page no 83]
3. VEDHU- external theraphy
   [Aruvaimaruthuvam. [page.no 40-41]
4. The drug were prepared by the author and tried in 40caese in the OPD and IPD.

2. AIM AND OBJECTIVE

AIM:

Phase II Clinical Observation criteria based study of "Uthiravatha Suronitham" and the drug choice "**KEELVAYU NIVARANA CHOORANAM" (Internal)** and "**VATHATHIRKU HYLAM"(External)** medicine.

OBJECTIVES

Primary objective

To evaluate the clinical efficacy of "**KEELVAYU NIVARANA CHOORANAM** " (internal) & "**VATHATHIRKU THYLAM"** (external) in reducing the pain and restricted joint movements in the treatment of **'Uthiravatha suronitham"** (rheumatoid arthritis).

Secondary objective

- To study the effect of Vedhu (steam bath) in reducing the pain towards the efficacy of medicine.
- To conduct a clinical trail with a well defined proforma on identified patients with "UTHIRAVATHA SURONITHAM"**.**
- To correlate the etiology, clinical features, signs and symptoms of "UTHIRAVATHA SURONITHAM" in siddha system to Rheumatoid Arthritis in modern science.
- To study "UTHIRAVATHA SURONITHAM" on the basis of Mukkutram, poripulangal, udalkattugal, envagai thervugal in order to evaluate the pathology.

3. REVIEW OF LITERATURE

SIDDHA ASPECT

PRINCIPLES OF SIDDHA

Siddhars have recommended certain basic guidelines to be followed for healthy living which includes following certain regimen as mentioned in" PINI ANUGA VIDHI" that help prevent disease. The rules are given below

1.Drinking boiled water

2.Take meals twice a day

3.Take diluted buttermilk and melted ghee

4.Take sufficient quantity of milk and milk products

5. Never eat root tubers except yam

6.Never consume food that was prepared the previous day

7.Always have food after feeling hungry

8.Always consume sour curd

9.Drink water at the end of meals

10.Practice walking after a good diet

11.Use hot water while taking oil bath

12. Take snuff medications eight times in a year

13. Take purgative medication every four months in a year

14. Take emetic medication once in six months

15.Never sleep during day time

16. Never suppress any natural urge

17.Always indulge in healthy sexual acts

18.Never sleep under a tree shade

19. Never smell fragrance during midnight

20. Never resides close to the dust

21.Apply eye medications once in three days

22.Shave weekly once

23. Take oil bath once in every 4 days

The siddha system is said to be the human body is composed of 5 elements such as :

1. EARTH- gives shape to the body and release site energy.Bones, muscle,and tissues if in the body
2. WATER-Makes earth supple and transmission of energy.Serum, lymph,saliva,etc., represent in the body.
3. FIRE- Makes the form of the body steady and gives vigour and stimulation. Digestion and circulation represent in the body.
4. AIR- Ignites the fire works as a life carrier and is the support of all contact and exchange respiration and Nervous system represent in the body
5. ETHER- It is the creator of life itself in the body.

A harmonious combination and function of these five elements in the body produce a healthy and beautiful life.

Characteristic features of Vatha diseases

1. Body ache
2. Nerve weakness
3. Dryness
4. Joint pain
5. Bony pricking pain
6. Constipation
7. Darkness of eyes,skin and urine
8. Mental distress
9. Difficulty to movement of limbs
10. Polydypsia

QUALITIES OF VATHAM

The normal qualities are

1.Rough

2.Dry

3.Light

4.Cold

5.Movable

6.Subtle

Opposite qualities of vatham

1. Soft
2. Untuous
3. Heavy
4. Hot
5. Stable
6. Solid
7. Relation with taste

CAUSES OF VATHA DISEASES

"பகரவே வாதமது கோபித் தப்போ
பண்பாக பெண்போக மதுதான் செய்யில்
நகரவே வெகுதூரவழி நடக்கில்
நளிரான காற்றுமே பனிமேற் பட்டால்
மிகரவே காய்கள் கனிகிழங்கு தன்னை
மிகவருந்தி மீறியே தயிர்தான் கொண்டால்
முகரவே முதுகெலும்பை முறுக்கி நொந்து
முழங்காலும் கனைக்காலும் கடுப்பு உண்டாமோ"

- *யூகி வைத்திய சிந்தாமணி பாடல் - 28*

Walking for long distance and harmful combinations like fruits, vegetables and tubers causes toxic factors which affects bones and joints.

According of Agathiar kanma kandam – 300

"நூலென்ற வாதம் வந்தவகை தானே
துண்மையாய்க் கன்மத்தின் வகையைக் கேளு
காலிலே தோன்றியது கடுப்ப தேது
கைகாலில் முடக்கியது வீக்கமேது
கோலிலே படுகின்ற விருட்ச மான
குழந்தை மரந்தன்னை வெட்டல்மேல் தோல் சீவல்
நாலிலே சீவசெந்து கால் முறித்தல்
நல்ல கொண்பு தழை முறித்தல்நலித்தல் தானே

- *அகஸ்தியர் கன்ம காண்டம் - 300 பாடல் 56*

Agathiar kanma kandam -300 attributes the following psychological factors such as, breaking the animal legs, removing the bark of living trees. Cutting the trees in the living branches and removing leaves to be the cause for vatha diseases.

UTHIRA VATHA SURONITHAM

Definition

Uthira Vatha Suronitham is a condition which deals with the involvement of joints which comprises the symptoms of pain and swelling mainly in the small joints and also in large joints with lassitude and anorexia

உதிரம், சுரோணிதம் - குருதி

வாதம் - வாயு + ஆகாயம்

இதனை வளி, சுற்று, காற்று, ஊதை, கால் என்றும் கூறுவர்.

வளி (வாதம்) தன் அளவில் மிகுந்திருக்கும் போது உடலில் வாதநோய்கள் தோன்றுகின்றன. "யூகி வைத்திய சிந்தாமணி" நூலின் படி

"என்னவே வாதமது எண்பதாகும்" என்று பாடினாலும் அவைகளின் பெயர்களையும், குணங்களையும் கூறும்போது எண்பத்தைந்து வகைகளைக் கூறியுள்ளார் அவற்றில் ஒன்று "உதிரவாத சுரோணிதம்".

Clinical features of uthira vatha suronitham

In Yugi Vaidhiya cinthamany

"வைகிதமாய்க் கணுக்காலு முழங்கால் தானும்
மற்கடஞ் சந்துபுற வடியும் வீங்கிச்
செய்கிதமாஞ் சிறுவிரல்கள் மிகவும் நொந்து
சிந்தைதரு மாறியே சலிப்புண் டாகும்"
பைகிதமாம் பைத்தியத்தில் வாத மிஞ்சிப்
பாரமாய் உற்பவித்து அழலுண்டாகும்
உய்கிதமாய் அசனமது தானும் வேண்டா
உதிரவாத சுரோணிதத் துணர்ச்சி யாமே

பொருள்

- கணுக்கால், முழங்கால், சந்துகள் இவைகளில் வீங்கும. Swelling in ankle joint, knee joint, dorsum of foot and other joints
- அழல் உண்டாகும் (Increased pitham)
- (Loss of appetite)
- சிறுவிரல்கள் மிகவும் (Pain) பிறப்பிக்கும். (Pain in fingers that is interphalangeal joints)
- சிந்தை தடுமாறும் (Mental confusion)
- சலிப்புண்டாகும; (Easy fatiguability

In Pararasasegaram,

"பொர்சீதே வுதிர வாத சுரோணித முழங்கால் தானும்
பொற்கணைக் காலும் சந்தும் புறவடி தானும் வீங்கி
நற்கணு விரல்க ளொந்து நடுப் பயித்திய வாதத்தில்
உற்பவக் குணமுமுண்டா முறுநூலிற் சொன்ன தாமே"

உதிரவாத சுரோணிதத்தில்

1. முழங்கால், கணுக்கால், சந்துகள், புறவடி (Dorsum of foot) ஆகிய இடங்களில் வீங்கும்
2. கணுக்காளில் உள்ள விரல்கள் தோறும் வலியுண்டாகும் (Pain in metacarpophlangeal and interphalangeal joints)
3. பயித்திய வாதத்தில் காணும் குணங்கள் உண்டாகும; (Osteoporosis)

Factors Stimulating Vatha Disease

"தொழில் பெறுகைப்புக் கார்த்தல் தவர்த்தல் விசுகினு சோறும்
பழைய தாம்வரகு மற்றைப் பைந்தினையருந்தினாலும்
எழில் பெறப் பகலுறங்கி இரவினிலுறங் காதலாலும்
பிழை நிகர் குரலினாலே வாதங் கோபிக்குங் காணே"

- ❖ Intake of items excessive in bitter and astringent taste.
- ❖ Intake of old cooked food items
- ❖ Sleeping in the day time and awakening at night.

"காணவே மிகவுண்டாலும் கருதுபட்டினி விட்டாலும்
மானை யார்கண் மோகமறக்கினு மிகுந்திட்டாலும்
ஆணவ மலகடம் மையனே விடாதலாலும்
வானுதன் மடநல்லாளே வாதங் கோபிக்கும் காணே"

- ❖ Excessive intake of food
- ❖ Starvation
- ❖ Excessive sexual desire

"பாரினிற் பயப்பட்டாலும் பலருடன் கோபித்தாலும்
காரெனக் கருதியோடிக் கழுமரத்துரத்தினாலும்
ஏர்பெறு தனது ரெசின் மிகத்துக்க மடைந்திட்டாலும்
பாரிய காற்றினாலும் படரினும் வாதங் காணும்".

- ❖ Fear
- ❖ Anger
- ❖ Excessive running
- ❖ Stress
- ❖ Exposure to wind daily

"காலங்கண் மாறியுண்ணும் காரியக் தாலுந்தண்ணீர்
சாலவே யருந்தினாலும் சந்தியிலுட் கார்ந்தாலும்
கோலமாம் புளிப்பு நெய்மை குறைவற வருந்தினாலும்
வாலவார் முலைநல்லானே வாதமுற் பலிக்குங் காணே"

- *யூகி வைத்திய சிந்தாமணி*

குளிர் காற்றில் உட்கார்ந்திருத்தல், புளிப்பு, நெய் உணவில் மிகுதியாக சேர்த்து கொள்ளல், காலம் தவறி உண்ணல் ஆகிய காரணங்களினால் வாதம் தோன்றும்.

"காணவே மிகவுண்டாலுங் கருதுபட்டினி விட்டலும்
மானனை யார்கண் மோகமிறக்கினு மிகுந்திட்டாலும்
ஆணவ மலங்கடமை யங்ஙனே விடாததாலும்
வானுதன் மடநல்லாளே வாதங்கோ பிக்குங்காணே"

அதிக அளவு உண்ணல், பட்டினி கிடத்தல், ஆணவம் அதிகரித்தல் ஆகியவற்றால் வாதநோய்கள் தோன்றும்.

"வளி தரு காய்கிழங்கு வரைவிலா தயிலல் கோழை
முளி தயிர் போன்மிகுக்கு முறையிலா வுண்டி கோடல்
குளிர்தரு வளியிற் றேகங் குனிப்புற வுலவல் பெண்டிர்
குளித்தரு முயக்கம் பெற்றோர் கடி செயல் கருவியாமால்"

- சபாபதி கையேடு

EXTRINSIC FACTOR

- Exposure to dampness and cold
- Sleeping during day time
- Month from aani to karthigai

INTRINSIC FACTOR

- Intake of old cooked food
- Drinking rain water
- Intake of food items which excess in bitter,astringent,and pungent taste

SIDDHA PATHOLOGY

Siddha system of medicine is based on Thirithodam theory. They are vatham, pitham and kapham the manifestation of all diseases are result of derangement of these uyir thathus (Thirithodam)

When the seven thathu and mukkutram are in equilibrium, a normal structural and physiological state of body is ensured.As the thathu are affected by the extrinsic

and intrinsic causative factors there will be distortion in the structural and functional state of the body.

In Uthiravatha suronitham

1. Vatham – increased

"வாதமலாது மேனிகெடாது"

Different kinds of vatham

1. Uyir kaal – Praanan (Respiratory functions)

"..... நலமான குணமெல்லாம் பிராண வாயு
பன்னவே நீலவண்ணம் தெய்வம் சந்திரன்
பலப்பலவாம் பொசிப்பெல்லாம் சீரணமாகும்.
- யூகி முனிவர்

This is the force of vital airs. According to Yugi muni, pranan starts from Moolatharam and comes through the nostril and dose inspiration and expiration. The inspiration and expiration is not uniform as the ratio is 8:12 there by the process of respiration is not complete. The praana helps in the digestion of ingested food.

2. **Keel Nokku Kaal – Abanan (Excretory funtion)**

"..... மருக்கவே கீழ்நோக்கி மலசலந்தள்ளும்
வாகாக நிறந்தானும் பச்சை யாகம்
அருக்கவே யாசனத்தைச் சுருக்கி வைக்கு....."

Abanan, the downward air, starts from swathittanam and descends down and is responsible for excretion of urine and faeces. It contracts the anus. It helps to take the essence of the digested food to the different parts of the body.

3. **Vyaanan (Perfusion of oxygen nutrients)**

"தறுப்பான சரவசரந் தனிலே நின்று
தானீட்டால் முடக்கல் பண்ணிப் பரிசமறியும்
அறுப்பான வன்னசா ரந்தன் னைத்தான் ....."

Vyaanan arises from the shoulders and go through all the 72,000 nerves and thus activate voluntary and involuntary movements of the body and thus make them to extend or contract. This appreciates the sense of touch, helps to take the essence of the food to the strategic points of the body and guards the body.

4. Udhaanan (Reverse peristalsis)

It is responsible for the physiological reflex actions like vomiting , hiccup, cough etc.,

5. Samaanan (Homestatic functions)

"…..வாமென்ற வாயுவின் மிஞ்சொட்டாமல்
மடக்கியே சமன்செய்து மருவப் பண்ணும்
தாமென்ற அறுசுவையைத் தண்ணீர் ரன்னம்
சமன் செய்து சரீரமெலாஞ் சாரப்பணும்….."

Samaanan starts from the umblical cord and spread out upto the lower limb. This is responsible for the balance of the other four vathas. It equalises the six tastes, water, food etc. and helps in assimilation.

6. Naakan (higher intellectual functions)

It is responsible for the intelligence of an individual waking, singing and pilo erection.

7. Koorman (Constrictory functions)

It is responsible for yawning, closing of mouth winking, shedding of tears, vision and opening of the eyes.

8. Kirukaran (secretory functions)

"……. கசிவுண்டாங் கடும்பசியிற் கன்மஞ் செல்லும்
கண்ணியே யிருத்தலொடு போத லாகும்
துசிவுண்டாய்த் தும்மலோ டிரும லுண்டாம்..."

Kirukaran lies in the tongue and causes nasal and salivary secretions. It induces hunger, it makes to concentrate one thing, sneezing and cough are attributed to kirukaran.

9. Devathatan (Mental and physical sluggishness)

It is responsible for laziness, quarrelling, arguing.

10. Dhananjayan (Bloater of the body)

It leaves the body by blowing up the cranium only on the third day after death.

In case of Uthiravatha suronitham

S.No.	Vatham	Affected
1.	Abanan	Constipation
2.	Vyaanan	Restricted joint movements
3.	Samaanan	Due to derangement of other vayus
4.	Kirukaran	Loss of appetite
5.	Dhevathatan	Insomnia

II. PITHAM

Types of Pitham

1. Anar pitham

Its action is characteristic of theyu. This is responsible for dryness and digestion of food.

2. Ranjaga pitham

It is responsible for the colour and contents of the blood.

3. Saathagam

It controls the whole body. It is responsible for the action what we think.

4. Aalosagam

It is responsible for the vision.

5. Prasagam

It is responsible for the vision.

In case of Uthiravatha suronitham

S.No.	Pitham	Affected
1.	Anal pitham	Loss of appetite
2.	Ranjaga pitham	Pallor due to low Hb
3.	Saathaga pitham	Difficulty in walking, climbing upstairs, squatting etc.
4.	Prasaka pitham	Skin pallor

III. KABHAM

Kapha has been further divided into five as follows.

1. Avalambagam

Lies in lungs, controls the heart and other kabhas.

2. Kilethegam

Lies in stomach, makes food soft and helps in digestion.

3.Pothagam

Responsible for identifying tastes.

4. Tharpagam

Present in the head and responsible for the coolness of both eyes.

5. Santhigam

It lies in the joints and responsible for the action of joints. The above function may be altered whatever the mukkutram is altered.

In case of uthiravatha suronitham

S.No.	Kabam	Affected
1.	Klethagam	Loss of appetite
2.	Santhigam	Restricted movements of joints.

PINIYARI MURAIGAL (METHOD OF DIAGNOSIS):

It is based upon three main principles.

i) Poriyal Arithal (Inspection)

ii) Pulanal Arithal (Palpation)

iii) Vinaathal Arithal (Interrogation)

i) Poriyal Arithal

Pori means "Five Sense Organs"

1. Mei (Skin)
2. Vai (Tongue)
3. Kan (Eye)
4. Mookku (Nose)
5. Sevi (Ear)

ii) Pulanal Arithal

Pulan are five senses. They are,

1. Smell
2. Taste
3. Vision
4. Sensation of touch (palpation)
5. Hearing

"Pulanal Arithal" means examining the "Pulan" of the patient by the "Pulan" physician to diagnose a disease.

iii) Vinaathal Arithal

Vinaathal is collect the information the history of disease, its clinical features etc, from the patient or his / her close relatives useful when the patient is unable to speak or in the case of a child.

DIAGNOSTIC METHODOLOGY IN SIDDHA SYSTEM OF MEDICINE

ENVAGAI THERVUGAL (EIGHT DIAGNOSTIC TOOLS)

These Tools not only help in the diagnosis but also helps to observe the prognosis of the diseases and for reassuring the patient and to be informed about the nature of diseases, they are

1. Naadi (Pulse)
2. Sparisam (Sensation to Touch)
3. Naa (Tongue)
4. Niram (Colour)
5. Mozhi (Voice)
6. Vizhi (Eyes)
7. Malam (Faeces)
8. Moothiram (Urine)

Naadi (Pulse)

The study of 'Naadi' is the important diagnostic stool in Envagai thervugal which gives almost the correct diagnosis. This method developed by siddhars to extend our sensual perceptions to the interior of our body to diagnose and confirm illnesses. The study of naadi at hand is the best because the radial artery is located superficially, the unique factor which pertaining the soul in the body is known as "Naadi". Naadi is felt in right hand for males and left hand for females. It is usually felt using 3 fingers (viz index, middle and ring fingers) in view of assessing the states of vatham, pitham, kabham in the ratio of 1: ½ : ¼ normally. Derangement of this ratio leads to various disease.

"கரி முகனடியை வாழ்த்தி
கைதனில் நாடி பார்க்கில்
பெருவிரலங் குலத்தில்
பிடித்தடி நடுவே தொட்டால்
ஒரு விரலோடில் வாதம்
உயர் நடு விரலில் பித்தம்
திரு விரல் மூன்றிலோடில்
திரு விரல் மூன்றிலோடில்
சிலேத்தும நாடி தானே"

- அகத்தியர் -2000

In Uthira vatha Suronitham, vatha kalappu Naadi will be felt.

Vadha Naadi

"வாதமெனும் நாடியது தோன்றில்
சீதமந்தமொடு வயிறு பொருமல் திரட்சிவாய்வு
சீதமுறுங் கிராணி மகோதரம் நீராமை
திரள்வாய்வு சூலை வலிகடுப்புத் தீர
நீர்முறுங் கிருமிகுன்மம் அண்டவாதம்
நிலையும் நீர்க்கிரிச்சரங்கள் தந்து மேகம்
பேதகமா முதரப்பிணி மூல ரோகம்
பேசவெகு பிணிகளுமே பொருள தாமே"

- *சதக நாடி*

Vatha Pitha Naadi

"பொருளான வாதத்தில் பித்தஞ் சேர்ந்து
பொருந்து குணங்களா மு"ணவாயு சக்தி
செரியாமை புளித்தேப்பம் பொருமல் நிரிற்
சிவப்புமலம் பிடித்தலுருந் தாது நட்டம்
கருவான தேகமதி லுளைச்சல் சோம்பல்
கைகால் தறிப்புநாக் கசக்கு மன்னம்
பரிவான ஊண்குறைதல் ருசிகே டாதல்
பலநோயும் வருத்திவைக்கும் பாங்கு தானே"

- *சதகநாடி*

2. Sparism (Palpation)

Skin examination reveals about the warmthness/chillness , dry/weeping skin, rough/smooth, soft/hard, tenderness, presence of ulcers, fissures, swelling, wrinkle, hair pigmentation etc.

In Udhira vatha suronitham the affected part may feel warm with swelling and tenderness.

3. Naa (Tongue)

The colour changes according to changes in Mukkuttram, coated tongue, dryness, Jaundice, cyanosis, paleness, ulcer, peeling of skin, fissures, teeth marks in the border, tumours, taste, deviation of the tongue and excessive salivation should be noted.

In Udhira vatha suronitham the tongue may be dry and coated. If anamia is present, the tongue may be pale.

4. Niram (colour)

By the examination of niram, the type of dhegam (body) cyanosis, redness, pallor, yellow discolouration can be noted.

Vatha Dhegi - Dark colour

Pitha Dhegi - Yellow or red colour

Kabha Dhegi - White or yellow colour

5. Mozhi (Speach or voice)

In the examination of mozhi, the pitch of voice (low or high) action of laughing, crying, slurring and speech in hallucination can be noted.

6. Vizhi (Eye)

Changes according to mukkutram, redness of eyes, ulcers, other diseased conditions should be noted.

7. Malam (Stools)

Vatha type : Black colour, stools with constipation.

Pitha type : Loose stools with yellowish red colour

Kapha type : White coloured stools with muccus

Thontha type : Stools possess some of the features of two doshas.

Other examinations like diarrhoea, presence of blood, ova, cyst odour should be noted.

In uthira vatha suronitham constipation may be present.

8. Moothiram (Urine)

The examination of urine is classified into two types

1. Neer kuri
2. Nei kuri

1. Neerkuri

- ❖ Niram indicates the colour of the urine
- ❖ Edai indicates the specific gravity of urine
- ❖ Manam indicates the smell of the urine
- ❖ Nurai indicates the frothy nature of the urine
- ❖ Enjal indicates the quantity (increasd or decreased) and deposits of urine voided.

In addition, frequency of micturition and sediments are noted.

2. Neikuri

"அருந்து மாறிரதமும் அவிரோத மதாய்
அ.ஃகல் அலர்தல் அகால வூண் தவிர்ந்தழற்
குற்றள வருந்தி உறங்கி வைகறை
ஆடிக் கலசத் தாவியே காதுபெய்
தொரு முகூர்த்த கலைக்குட் படுநீரின்
நிறக்குறி நெய்க்குறி நிருபித்தல் கடனே"

- *தேரையர்*

Procedure

Prior to the day of urine examination for neikuri, the patient is advised to take a balanced diet and the quantity of food must be proportionate to his appetite. The patient should have a good sleep. After waking up in the morning the first voided urine is collected in a glass container and is subjected to analysis withing one and half hours.

A drop of gingelly oil is dropped over urine without disturbing the nature of the neikuri should be noticed in direct sunlight. The spreading pattern exhibited by the oil droplet over the surface of urine gives a confirmatory clue that helps in the disease.

SEVEN UDAL THATHUKKAL

1.	Saaram	Strengths the body and mind.
2.	Senneer	Gives power, knowledge and boldness to the mankind.
3.	Oon	It strengthens the body.
4.	Kozhuppu	It lubricates the joints.
5.	Enbu	It protects all the internal organs and gives the structure to the body.
6.	Moolai	It is present in the bone marrow
7.	Sukkilam and Suronitam	Reproduction

S.No.	Udal kattukal	Decreased features	Increased features
1.	Saaram	Loss of weight, lassitude, Dryness of the skin, Diminished activity of sense organs	Leads to disease identical to increased kabham, like loss of appetite, profuse salivation, depression etc.
2.	Senneer	Tiredness, Lassitude, Anaemia, Dryness	Increased blood pressure Reddish eye and skin jaundice, Haematuria, Boils and tumors in different parts of the body.
3.	Oon	Muscle wasting, lethargic sense organs	Extra growth around neck, face, abdomen, thigh, genitalia etc.
4.	Kozhuppu	Joint pain, Emaciation, Splenomegaly.	It leads to identical features of increase oon associated with dyspnoea on exertion
5.	Enbu	Joint pain, falling of teeth, splitting and falling of hair and nails.	Excessive ossification and dentition.
6.	Moolai	Osteoporosis of the bone, blurred vision.	Obesity, swelling of interphalangeal joints, oliguria, Non-healing ulcers.
7.	Sukkilam (or) Suronitham	Pain in the genitalia failure to reproduce	Increased sexual activity , Increased formation of urinary calculi.

In uthiravatha suronitham saaram, seneer, oon, kozhuppu, enbu are commonly affected.

TYPES OF VATHA SURONITHAM IN YUGI CYINTHAMANI

- Vadha Suronitham
- Sithuvatha Suronitham
- Vaithiya Vatha Suronitham
- Paithiya Vatha Suronitham

- Slethumavatha Suronitham
- Utharavatha Suronitham
- Uthiravatha Suronitham

சித்துவாதசுரோணிதம்

‘‘வாறான சரீரமெல்லா நுழைந்து ஊதல்
மாசற்ற தோல்தானுந் திரைந்து போகும்
நாறான நாறுபோல்ந ரம்பு சுக்கும்
நாக்குத்தான் வழவழத்துக் கோழை யாகும்
நூறான நெருப்புத்தான் பட்டாற் போல
நொந்துமே சடமெல்லாம் கொப்ப ளிக்கும்
வீறான வுரிந்துபின்னை வெதும்பி வீங்கும்
மிக்கசித் துவாதசுரோ ணிதம தாமே’’.

SITHUVATHA SURONITHAM

- Anasarca.
- Wrinkles.
- Neural pain.
- Glossy tongue.
- Sialorrhoea.
- Bullous eruption as in burn.
- Exfoliation, swelling and Warmthness.

சேத்துமவாதசுரோணிம்

‘‘பண்பாக வுடல்குளிர்ந்து ஏறு வீங்கிப்
பதைப்பான விடந்தொட்டாற் பார நோவாம்
திண்பான சிரசுநெற்றி நோக்கா டுண்டாம்
சிலேட்டு மமாய்க்கோழை யொடுசு வாசமாகும்
மண்பாக மயக்க மொடு கனவு முண்டாம்
வாய்வரண்டு ருசியில்லா வருத்த மாகும்
நண்பாக நாடியுமே பட படக்கும்
நற்சேட்ப சுரோணிதமாம் நாடுங் காலே’’.

SLETHUMAVATHA SURONITHAM

- Chillness with abdominal distension.
- Severe pain and Head ache.
- Syncope and Hallucination.
- Dryness of mouth and Anorexia.
- Tachycardia.

உதரவாதசுரோணிதம்

"நாடுமே சுரம்வந்து நடுக்க லுண்டாம்
நாவரண்டு தலைநொந்து உடம்ப ழுத்தி
வாடுமே தேகமெல்லா மனிச்சப் பூப்போல்
மகாவருத்த முண்டாகி மயக்க மாகும்
சாடுமே யடிக்கடிதான் பேதி தானும்
தவிக்குமே தண்ணீர்தா னாட்ட மாகித்
தேடுமே சோற்றின்மேல் நினைவு தானும்
செயவுதர வாதசுரோணி தந்தா னென்னே".

UTHARAVATHA SURONITHAM

- Fever with rigor.
- Dryness of mouth.
- Pain in all over the joints.
- Headache.
- Diarrhoea.
- Excessive thirst.
- Hunger.

வைகிதவாதம்

"ஆமென்ற வீங்கினதோர் விடத்தில் ரத்தம்
அழுத்தமாய்த் திரண்டுமே எங்கும் பாய்ந்து
ஓமென்று ஓட்டியேதி ரண்டி ருக்கும்
உறுதியாய்த் தொட்டுடனே மெத்தென் றாகும்
தேமென்ற தேகமெங்க ணுமு சுக்கும்
சீறிய தோரிருமலொடு காச்ச லுண்டாம்
பாமென்ற படந்தனிலே திமிருண் டாகும்
பாரமாய் வைகிதமாம் வாதந் தானே".

- யூகி வைத்திய சிந்தாமணி

Uthiravatha Suronitham is differentiated from other types of Vatha Suronitham as follows:

VAIKITHA VATHA SURONITHAM

- Swelling with hyperaemia.
- Soft on touch.
- Cough with pyrexia.
- Irritability.

வைகிதவாதம்

“ஆமென்ற வீங்கினதோர் விடத்தில் ரத்தம்
அழுத்தமாய்த் திரண்டுமே எங்கும் பாய்ந்து
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தேமென்ற தேகமெங்க ணுமு சுக்கும்
சீறிய தோரிருமலொடு காச்ச லுண்டாம்
பாமென்ற படந்தனிலே திமிருண் டாகும்
பாரமாய் வைகிதமாம் வாதந் தானே”.

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SIRAPPU MARUTHUVAM FOR VATHA DISEASE

1. ஒற்றடம்
2. வேது
3. தொக்கணம்
4. ஆசனம்
5. பிராணாயாமம்
6. தியாdk;

SPECIFIC TREATMENT FOR UTHIRA VATHA SURONITHAM (STEAM BATH)

- உடலிருந்து வியர்வை பெருகும்படி செய்வதற்கு ஏற்றமுறைகளில் ஒன்று வேது.
- நீரைச் சில மூலிகைகளுடன் சேர்த்து கொதிக்க வைத்து அதனின்று எழும் ஆவியை பிடித்தல;.

A steam room is an enclosed space with large amounts of high temperature steam, creating a high humidity environment. People sit in this room in a similar way to a sauna (conversely a hot, but dry atmosphere), for relaxation and purported benefits to health and well being. Steam rooms are commonly maintained at a

temperature of 41 degrees Celsius or above, with a high humidity of around 100% adding to the sensation.

The benefits of a steam bath are numerous. Some of the benefits include:

- The most common and obvious reason is to relieve tension buildup and various forms of stress.
- Various ailments such as arthritis, muscle pains and the like can be relieved because of its warm effect to the body.
- Old people will surely benefit from this since joint pains and other body pains can be relieve.
- Steam rooms due to its heat effect make you sweat a lot thus your body will eventually release toxins and other negative energies.
- It will also regulate and stimulate the flow of your blood and make your metabolism works faster.
- It also makes your skin looks fresh, young looking and truly healthy.
- It can give you a lot of self-confidence due to the good effects it will cause to your personal appearance.
- Increases circulation for healthier skin & more energy.
- Relaxes stiff muscles & ceases swelling or tension in joints associated with arthirits.
- As well as nutrients also gets pushed to the surface of the skin, which may have a positive effect on collagen production. Collagen makes bones stronger and helps cell regeneration. That part about cell regeneration makes it partially accountable for firmer skin.

Anyone suffering from sleeping disorders, poor skin circulation & Muscular tension & Weakness will benefit from taking a steam bath.

STEAM BATH

Introduction

A room that is filled with hot steam for the purpose of cleansing and Steam bath refreshing the body and for relaxation. It is a restorative concept of steam, to revive our overall health and enhance appearance.

Types

The difference between a sauna and a steam room can be summed up simply -- dry vs. wet. Sauna provides dry heat, while steam room generates moist heat. Both can open up your pores, loosen up your muscles and help you relax

Prepatory procedure

Take a shower before you use the steam bath to remove dirt and oils. Remove any metal jewellery. Metal conducts heat very efficiently and can heat up in the steam room to the point where it could be uncomfortable or even burn you. And recommends you remove the contact lenses before enter the steam room.

Dress code

For mens is shorts and for womens is towel and preferred material is cotton

Rest

Patient can lie down, plan to relax. Ask to close the patient eyes if you like, breathe deeply and focus on letting the heat soak in and relax you. Remain there as long as you are comfortable, which can be as little as 5 minutes or as long as 20 minutes.

Recover

Take a cool shower, then rest and allow your body to return to normal temperature. Drink some water and enjoy this break from a busy day.

Merits and demerits

Vasodilatation -Benefits

Both steam rooms and dry saunas cause the blood vessels in the skin to dilate, in part accounting for the warm glow appearance afterwards. The blood flow out of the heart increases by 2 or more times after a 10 to 15 minute steam room or sauna exposure.

Risks :

However, the blood flow to the internal organs actually decreases, because so much blood is being directed to the skin instead. This can be a problem for folks with coronary heart disease.

Analgesia –Benefits:

Heat has long been recognized as beneficial for folks with fibromyalgia, arthritis and other painful conditions.

Risks:

If heat exposure is extreme, excessively prolonged, or if the individual has underlying irritation of the skin, heat can cause the equivalent of a sunburn, or thermal burn.

In addition, steam exposure may be a concern if you have had recent surgery(particularly if sutures are still in place) or if you have an open or infected wound.

Antispasmodic

Benefits:

Heat tends to cause relaxation of the musclesand many individuals note improved recovery ofmuscle soreness and decreased problems with delayed muscle soreness when they use a sauna or steam room after exercise.

Diaphoresis (sweating)–Benefits:

The average person will sweat about a pint during a 15 minute session in a sauna, depending on the person's acclimatization to heat exposure. This has theoretical benefits for cleansing skin pores and some people believe sweating helps clear toxins from the body. This is not well proven and in many in stances, is simply not true. In general, people with documented toxicant accumulation in their bodies benefit from specific medical treatment directed at the specific toxicants, rather than sweating. In addition, many of the toxicants of concern these days, for example: pesticides and many metals, asbestos, are not cleared very well through the sweat.

Risks:

The effect of both wet and dry heat to increase fluid loss from the body can also be a problem, particularly in folks who are already somewhat dehydrated (e.g. after heavy exercise within adequate fluid replacement or in response to the diuretic effects of caffeine, beverage alcohol, and medications (diuretics). Dehydration can be a problem in people who have blood vessel blockages to the brain and the heart.

Some individuals experience an increase in their migraine headaches in response to dehydration.

There are a number of other medications that can affect the body's normal response to heat either by inhibiting sweating or by otherwise interfering with the normal physiology, for example, some medications used for psychiatric conditions like schizophrenia. Use of stimulant medications for conditions like ADD or excessive sleeping also increases the health risks from heat exposure.

Sedative-Benefits:

Heat exposure through a dry sauna or steam room causes a sense of relaxation for many people, with both muscle relaxation and a reduction in the sense of stress and anxiety. Many people find use of steam rooms and saunas improves the quality of their sleep

Expectorant–Benefits:

Steamheat (not dryheat) can have therapeutic benefits for thinning mucous lining it easier for some individuals to cough up phlegm.Itcan also free up sinus passage ways and Eustachian tubes in individuals with sinus and Eustachian tube problems.

Risks:

This same effect can trigger increased problems with wheezing and chest tightness in some asthmatics and other individuals lung disease, particularly if they have noted problems when taking a steamy shower previously.

Calorie Burn Benefits:

Although exposure to heat increases energy consumption and there by increases calorie burn, for example, up to 300 to 400 Kcal during 20 to 30 minute sauna bath, us helping to promote weight loss,

Risks:

Individuals who have been cautioned to restrict exercise intensity by health care providers should be aware that the effects of heat are similar to those of exercise for increasing heart rate.

Increasing energy consumption through increased work of the heart can be a concern for people with coronary heart disease, congestive heart failure, valvular heart disease or heart rhythm problems

Scientific evaluation

Although sauna bathing causes various acute, transient cardiovascular and hormonal changes, it is well tolerated by most healthy adults and children.. Some studies have suggested that long-term sauna bathing may help lower blood pressure in patients with hypertension and improve the left ventricular ejection fraction in patients with chronic congestive heart failure, but additional data are needed to confirm these findings. Sauna bathing may also alleviate pain and improve joint mobility in patients with rheumatic disease. Although sauna bathing does not cause drying of the skin-and may even benefit patients with psoriasis-sweating may increase itching in patients with atopic dermatitis. Contraindications to sauna bathing include unstable angina pectoris, recent myocardial infarction, and severe aortic stenosis. Sauna bathing is safe, however, for most people with coronary heart disease with stable angina pectoris or old myocardial infarction. Very few acute myocardial infarctions and sudden deaths occur in saunas, but alcohol consumption during sauna bathing increases the risk of hypotension, arrhythmia, and sudden death, and should be avoided.

MODERN ASPECT
RHEUMATOID ARTHRITIS

The term rheumatoid arthritis was first used by Sir Archibald Garrod in 1876 to describe a chronic non-suppurative inflammatory arthropathy distinct from gout and osteoarthritis. It is generally regarded as an auto-immune disease but details of its pathogenesis remain unclear. Its prevalence is remarkably consistent worldwide (approximately 1 per cent) with a few important exceptions that have helped to highlight environmental influences and the role of the immune response genes. Inflammation of the synovial joints leading to destruction of joints and peri articular tissues is, the most obvious clinical and pathological characteristic of the disease, but a wide variety of extra-articular features can also develop.

Rheumatoid Arthritis is a chronic multisystem disease affecting the connective tissues of the whole body with focalised involvement of the musculoskeletal system. The characteristic feature of established RA is persistent inflammatory synovitis usually involving peripheral joints in a systemic distribution. The potential of Synovial inflammation to cause cartilage damage, bone erosions and subsequent changes in joint integrity is the hallmark of the disease. The course is variable despite of destructive potential. Some patients experience a mild oligo articular illness of brief duration with minimal joint damage but most will have progressive polyarthritis with marked functional impairment clinical manifestations.
RA is a chronic polyarthritis. In approximately 2/3 of patients it begins insidiously with Fatigue, Anorexia, generalized weakness, vague musculoskeletal symptoms until the appearance of synovitis becomes apparent.

Specific symptoms usually appear gradually as several joints, especially those of hands, wrist, knee and feet become affected in a symmetric fashion. In some of individuals constitutional symptoms, including fever, Lymphadenopathy, Spleenomegaly are present.

Epidemology

The incidence og RA is in the region of 3 cases per 10,000 population per annum. Onset is uncommon under the age of 15 and from then on the incidence rises with age until the age of 80. The prevalence rate is 1%, with women affected three to

five times as often as men. First – degree relatives prevalence rate is 2 – 3 % and disease genetic concordance in monozygotic twins is approximately 15 – 20%.
It is strongly associated with the inherited tissue type major histocompatibility complex (MHC) antigen HLA – DRA (Most specifically DR0401 and 0104) – hence family history is an important risk factor.

Aetiology

Rheumatoid arthritis has a complex multifactorial aetiology. There is considerable evidence for an important genetic component. Twin studies indicate a concordance rate of around 20 per cent in monozygotic twins, although this figure is probably influenced by the severity of the disease in the proband.

Rheumatoid arthritis has many similarities to reactive arthritis, in which a wide range of different Gram-negative organisms are known to trigger the disease, infection at sites distant from the joints has not been identified, inspite of claims that infections of urinary tract (Proteus sp) may be more common in patients with rheumatoid arthritis than in healthy controls. Likewise, no particular organism has ever been found reproducibly in the joints of patients with rheumatoid arthritis, although there have been sporadic reports of the isolation of viruses (rubella, parvovirus), atypical mycobacteria, and mycoplasma.

Some populations appear to be at unusually high or low risk of developing rheumatoid arthritis, and the study of these has yielded some clues to its aetiology. Certain genetic markers are associated with rheumatoid arthritis. The risk to the first-degree relatives of probands with mild, non-erosive, seronegative disease (2-3 per cent) is little greater than in the risk in the general population.

The possible aetiological factors.

- Genetic predisposition - Rheumatoid arthritis runs in families. It is associated with class II major histocompatability complex allele HLA - DR4 and HLA - DRB1. Genetic factors alone do not account for the disease.
- Abnormal immune response : Rheumatoid arthritis may be a manifestation of an immune - mediated response to infections are caused by Mycoplasma, Epstein - Barr virus, Cytomegalovirus, parvovirus in a genetically predisposed individual.

Immune Over Activity

1. Presence of Serum of abnormal immunoglobulin Rheumatoid factor IgG and IgM.
2. Infiltration of synovial tissue by immunologically component cells, Lymphocytes, Plasma cells which are responsible for local production of Ig including Rheumatoid factor.
3. Presence of immune antigen - antibody complexes within leucocytes in synovial fluid and peripheral blood.
4. The finding of lower complement levels in synovial fluid.

Signs of Symptoms of Articular Disease:

- Pain, Swelling and tenderness may initially be poorly localised to the joints. Pain is aggravated by movements.
- Generalized Morning Stiffness of > 1 hr duration is a variable feature and is frequent and usually greatest after periods of inactivity.
- Weakness, easy fatigability, Anorexia and weight loss are Present. $40^{o}C$ fever on occasion may be present sometimes and temperature elevation of $>38^{o}C$ suggest the presence of intercurrent problem such as infection.
- Clinically synovial inflammation causes swelling, tenderness
- and limitation of movement. Pain Originates from joint capsule which is abundantly supplied with pain fibres and is markedly sensitive to stretching or distention. Joint swelling results from accumulation of synovial fluid, hypertrophy of synovium and thickening of joint capsule.
- RA most often causes symmetric arthritis with characteristic
- involvement of certain specific joints such as proximal interphalangeal joints and Metacarpophalangeal joints.
- Synovitis of the wrist joints is a nearly uniform feature of RA with limitation of movements, deformity and median nerve entrapment (Carpel tunnel syndrome).
- Synovitis of elbow joint often leads to flexion contracture.
- The knee joint is commonly involved with synovial hypertrophy, chronic effusion and frequently ligamentous laxity. Bakers cyst is the extension of inflammed synovium into the popliteal fossa.
- Arthritis in the forefoot, ankles of subtalar joints can produce severe pain and deformities.

- Axial involvement is usually limited to the upper cervical spine with inflammation from synovial joints and bursae of the upper cevical spine leads to atlantoaxialsubluxation. Accompanied by pain in occiput. On rare occasions it may lead to compression of spinal cord.

A varitey of Characteristic joint changes occur

- Laxity of supporting soft tissue structures.
- Damage or weakness of ligaments, tendons and joint capsule.
- Cartilage damage, muscle imbalance.

Characteristic changes in Hand

1. Radial deviation at wrist with ulnar deviation of digits often with palmar subluxation of the proximal phalanges 'z' deformity.
2. Swan neck deformity
3. Hyperextension of the Proximal interphalangeal joint with compensatory flexion of distal interphalangeal joints.
4. Boutonniere deformity
5. Flexion contracture of the proximal interphalangeal joints of extension of distal interphalangeal joints.
6. Hyperextension of the first interphalangeal joint and and flexion of the 1st metacarpophalangeal joint with a consequent loss of thumb mobility of pinch.

Foot

1. Changes in feet with eversion at the hind foot (subtalar joint) plantar,
2. Subluxation of metatarsal heads, widening of fore foot, Hallux valgus,
3. Lateral deviation and dorsal subluxation of toes.

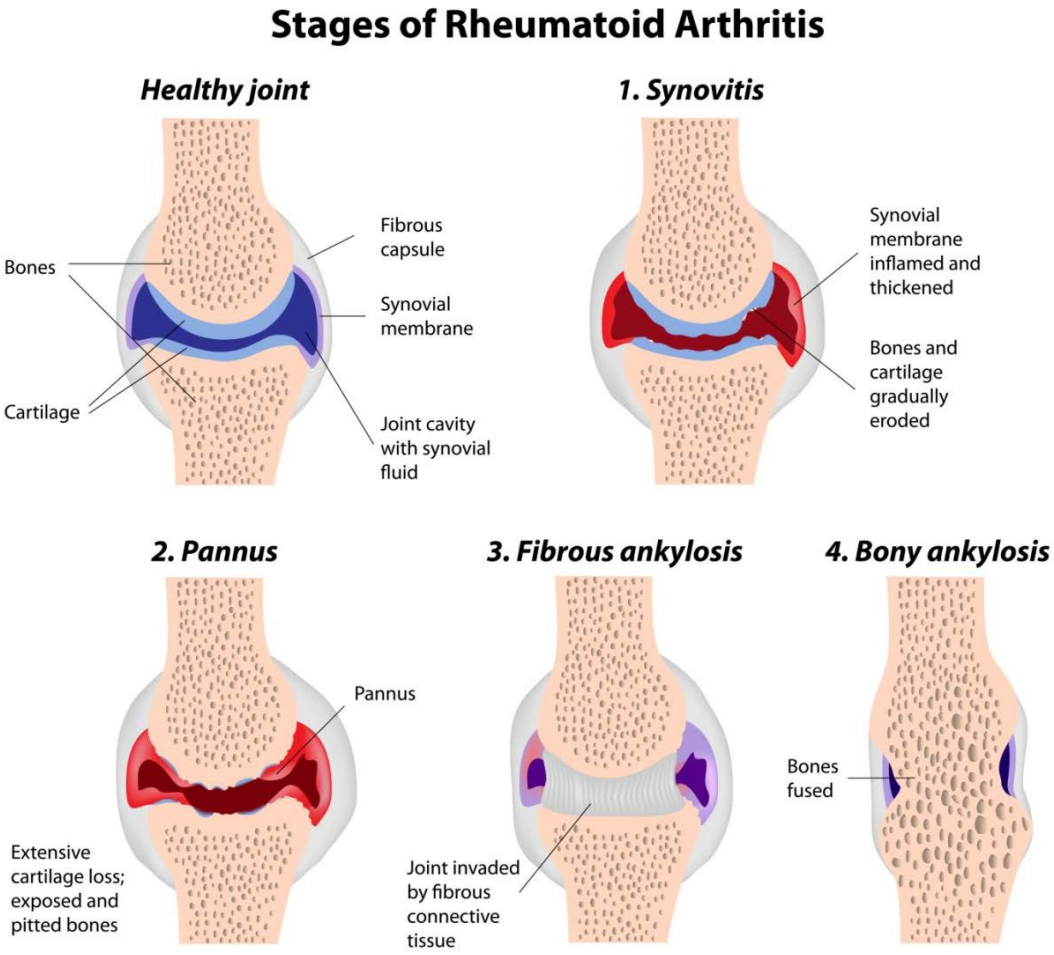
Pathology

Rheumatoid disease is considered to be an autoimmune response to an unknown antigen and the antibody formed is the rheumatoid factor which is identified as immunoglobulin M (Mostly IgM) or IgG (Less commonly). The Rheumatoid factor is an IgM antibody directed against the FC portion of IgG antibodies.

Rheumatoid arthritis is an inflammation of the synovial membrane which becomes Oedematous and thickened with inflammatory exudates. Chronic persistant synovitis is the characteristic feature of rheumatoid arthritis.

The disease follows three stages.

- Synovitis
- Destruction
- Deformity



- Lymphoid follicles forms nodules with scattered cells.
- In later stages synovium is more vascular and throws a fibrous exudate which gets organised into a granulation tissue and spreads over the articular cartilage as the pannus.
- The articular cartilage gets lysed from the surface.
- The inflammatory process spreads into the capsule and the periarticular tissue.
- During the healing process the granulation tissue pannus destroys the articular cartilage uniting the joint surface and causing a Bony ankylosis.

1. Vasculitis Necrosis Fibrosis	Joint Structure	Synovitis – Effusion Articular cartilage destruction Pericapsulitis Ligamentous instability Arthritis	Swelling Stiffness Instability – Subluxation and dislocation Intrinsic - plus deformity
2. Plasmacell proliferation	Tendon	Teno synovitis Rupture	Ulnar deviation of fingers Concertina collapse of fingers
3. Granulation tissue and pannus formation	Muscle	Wasting and Atrophy Fibrosis	Contracture Ankylosis
4. Synovial hypertrophy in joint in tendon	Bone Subcutaneous	Osteoporosis thining of cortex and loss of trabeculae structure. Cyst formation - Subchondral erosions (adjacent to metaphysis) Destruction. Nodules	

The key considerations in the pathogenesis of the disease are 1) the nature of the autoimmune reaction, 2) the mediators of tissue injury, 3) genetic susceptibility and 4) the arthritogenic antigen.

The autoimmune reaction in RA consists of activated CD4 + T cells, and probably B lymphocytes, and how they are initially activated are still unknown. The T cells apparently function mainly by stimulating other cells in the joint to produce cytokines that are central mediators of the synovial reaction. Although the contribution of autoreactive B cells has been an issue of controversy, there is increasing evidence that immune complex deposition may also play some role in the joint destruction. Perhaps, the major advances in our understanding of the disease have been a better appreciation of the actual mediators of joint injury. Cytokines are believed to play a pivotal role, and the most important of these cytokines are TNF and K-1. Both are probably produced by macrophages and synovial lining cells that are activated by the T cells in the joint TNF and IL-1 in turn, stimulate synovial cells to proliferate and produce various mediators of inflammation (such as **prostaglandins**), and matrix **metallo proteinases** that contribute to cartilage destruction. Activated T cells and synovial fibroblasts also produce RANKI, which activates osteoclasts and promotes bone destruction. Thus a chain of events is set up that leads to progressive

joint damage. The hyperplastic synovium rich in inflammatory cells become adherent to and grow over the articular surface, forming a pannus, and stimulates resorption of the adjacent cartilage. In the end, the pannus produces sustained, irreversible cartilage destruction and erosion of subchondral bone. The realization of the important roles of TNF and IL-1 is the basis for the successful use of anticytokine therapy, especially against TNF.

Genetic susceptibility is a significant component of the development of RA. There is a high rate of concordance between monozygotic twins and a well defined familial predisposition. Multiple gene loci are beleived to be responsible for susceptibility to the disease, but most of these have not been identified yet. One susceptibility gene that is known is in the class II HLA locus and specifically a region of 4 amino acids located in the antigen binding cleft that is shared in HLA DR BI 0401 and 0404 alleles. This HLA-DR allele may bind and display the arthritogenic antigen to T cells, although there is no formal evidence in support of this idea.

The antigen that trigger autoimmunity and precipitate the reaction are not known. There has been great interest in exploring microbial antigens, as the initiating triggers, but no firm evidence has definitively identified a microbial organism as an etiologic agent in rheumatoid arthritis.

EXTRA – ARTICULAR MANIFESTATIONS

Systemic: ➢ Fever ➢ Weight loss ➢ Fatigue ➢ Susceptibility of infection	**Vasculities:** ➢ Digital arteritis ➢ Ulcers ➢ Pyoderma gangrenosum ➢ Mononeuritis multiplex ➢ Visceral
Musculoskeletel: ➢ Muscle wasting ➢ Tenosynovitis ➢ Bursitis ➢ Osteoporosis	**Cardiac:** ➢ Pericarditis ➢ Myocarditis ➢ Endocarditis ➢ Conduction defects ➢ Coronary vasculitis ➢ Granulomatous arthritis

Haematological: ➢ Anaemia ➢ Thrombocytosis ➢ Eosinophilia	**Nodule:** ➢ Sinuses ➢ Fistula
Lymphatic: ➢ Spleenomegaly ➢ Felty's syndrome	**Pulmonary:** ➢ Nodules ➢ Pleural effusion ➢ Fibrosing alveolitis ➢ Bronchiolitis ➢ Kaplan's syndrome
Occular: ➢ Episcleritis ➢ Scleritis ➢ Scleromalacia ➢ Kerato conjunctivitis sicca	**Neurological:** ➢ Cervical Cord compression ➢ Compression neuropathies ➢ Peripheral neuropathy ➢ Mononeuritis multiplex ➢ Amyloidosis

Frequency Joint involvement in Rheumatoid arthritis

1.	MCP / MTP / PIP joints	-	90%
2.	Knee, ankle, wrist joints	-	80%
3.	Shoulder joint	-	60%
4.	Hip, elbow, acromion	-	50%
5.	Cervical spine	-	40%
6.	Temperomandibular and Sternomastoidjoints	-	30%
7.	Cricoarytenoid joint	-	10%

Diagnosis

The revised criteria of 1987 (American college of Rheumatology)

Criteria	Comments
1. Morning stiffness	Duration > 1 hr lasting > 6 weeks
2. Arthritis of atleast 3 areas	Soft tissue swelling or exudation lasting > 6 weeks

3. Arthritis of hand joints	Wrists, metacarpophalangeal joints or proximal interphalangeal joints lasting > 6 weeks
4. Systemic Arthritis	At least one area, lasting > 6 weeks
5. Rheumatoid Nodules	As observed by the physician
6. Serum Rheumatoid factor	As assessed by a method positive in less than 5 percent of control subjects.
7. Radiographic changes	As seen on anteroposterior films of wrists and hands

Rheumatoid arthritis is diagnosed if 4 of the 7 criteria are met.

DISEASE PREVALENCE AND ONSET

Rheumatoid arthritis may occur at any age but has a peak incidence in the fifth decade. The lifetime incidence of the disease in women (1.8 per cent) is three times more than in males (0.5 per cent) and the prevalence of the disease in women over 65 years old is more than 5 per cent. The sex difference is most pronounced (as high as 6:1) in those with early onset disease but is almost equal by the age of 65. The disease starts twice as commonly in winter.

Explosive onset

In about 10 per cent of cases the onset of the disease is very rapid even overnight, with severe symmetrical polyarticular involvement.

Systemic onset

This is particularly common in middle-aged men in whom non- articular feature may dominate the clinical picture. Fever, myalgia, weight loss, anaemia, pleural effusions, and vasculitic lesions may be severe, sometimes in the absence of marked joint pathology.

Insidious onset

The majority of cases of rheumatoid arthritis develop insidiously over weeks or months, with gradually increasing joint involvement seen in up to 70 per cent of cases.

Polymyalgic onset

Limb girdle muscle symptoms may precede the onset of arthropathy, particularly in the elderly.

Mono-and pauci-articular onset

In young women there may initially be very limited joint involvement, particularly involving the knees.

Joint features

Rheumatoid arthritis is typically a distal, symmetrical, small-joint polyarthritis involving the proximal interphalangeal and metacarpophalangeal joints of the hands, the wrists, metatarsophalangeal joints, ankles, knees, and cervical spine. The shoulders, elbows, and hips are less frequently involved, but can be a major source of morbidity. **Any synovial joint in the body may be affected**, including the cricoarytenoid and the temperomandibular joints. In addition, periarticular synovial structures, such as bursae and tendon sheaths, are commonly inflammed.

The most common symptoms are **pain** and **pronounced stiffness**. The latter frequently exhibits a **diurnal rhythm**, **worse on rising in the morning** and then recurring towards the evening, perhaps reflecting the diurnal variation in plasma cortisol levels.

Gentle activity may alleviate the symptoms but is followed by stiffening or 'gelling' with subsequent inactivity. The affected joints are frequently tender, swollen and warm and there may be limitation of both active and passive movement. Muscle wasting serves to accentuage the local swelling of the joint, which is in part due to proliferation of the synovial tissue and in part to synovial effusion within the joint. Progressive destruction of the articular cartilage, subchondral bone, and periarticular soft tissues eventually combine to produce the characteristic deformities seen in long-standing rheumatoid arthritis.

In parallel with these clinical changes there are characteistic radiological appearance which may be helpful in the diagnosis of early rheumatoid arthritis and in monitoring its progress. In the early stages of the disease it is common for the first evidence of erosions to be in the feet. Diagnostic views in Radiological changes include:

1. soft-tissue swelling
2. juxta-articular osteoporosis
3. loss of joint space due to erosion of the articular cartilage
4. bone erosions at the point of attachment of the synovium and
5. joint deformities.

Hands and wrists

The appearance of the hands in rheumatoid arthritis is highly characteristic. Early in the disease there may be **soft-tissue swelling** around the affected joints. Involvement of the proximal **interphalangeal joints give a spindle-shaped appearance** to the fingers, and soft-tissue swelling can be observed over the ulnar styloid, and in the second and third metacarpophalangeal joints. Distal interphalangeal joint involvement is less common (about 15 per cent of cases) but rheumatoid arthritis may sometimes be superimposed on pre-existing osteoarthritis of these joints.

Tenosynovitis of the long flexor tendons in the palm of the hand may exacerbate stiffness of the finger and cause **'trigger finger'**. This may be associated with palpable crepitus over the tendon on active or passive movement of the corresponding finger. Similar synovitis at the wrist within the flexor retinaculum may cause compression of the median nerve with the typical features of carpal tunnel syndrome - paresthesiae of the first three digits and the radial side of the ring finger, wasting and weakness of the thenar mucles, with night pain frequently extending proximally as far as the elbow: typically these symtoms can be relieved by shaking the hand or movement of the fingers. Tinel's sign is sometimes positive but relatively insensitive. Phalen's sign (pressure over the carpal tunnel with the wrist in flexion) may be more useful, not only because it is more frequently positive but also because it reproduces the symptoms accurately. The diagnosis can be confirmed if necessary by nerve conduction studies.

On the dorsal surface of the wrist, synovitis of the extensor tendons is common and may lead to rupture. A 'dropped finger' affecting the little finger is an important indication for surgical exploration and synovectomy.

Bull's horn deformity due to rupture of the extensor communis tendon from synovitis near the ulnar styloid. Selective sparing of the extensor indicis proprius and extensor digiti minimi tendons has in this instance preserved the ability to point the index and little finger independently

Volar subluxation of the fingers at the metacarpophalangeal joints occurs as a result of destruction of the articular cartilage, and subsequent instability of these joints. Since the flexor tendons provide the strongest force acting across these joints progressive subluxation towards the palm may develop, leaving the metacarpal heads relatively prominent.

Ulnar deviation and subluxation of the fingers as a result of instability of the metacarpophalangeal joints. The fingers may tend to drift in an ulnar direction because of the ulnar vector of the action of both the flexor and extensor finger tendons. The process may be exacerbated by radial deviation of the carpus and also by ulnar subluxation of the extensor tendons if the support which usually hold them in place over the centre of the metacarpophalangeal joints are weakened by synovitis.

Swan neck deformities occur following volar subluxation of the proximal phalanges at the metacarpophalangeal joints, with subsequent contracture of the intrinsic muscles which become extensors rather than flexors of the proximal interphalangeal joints. Compensatory flexion of the distal interphalangeal joints occurs as a result of a tenodesis effect as the flexor digitorum profundus tendon is stretched over the hyperextended proximal interphalangeal joint.

Boutonniere (button-hole) deformity occurs when a chronic effusion within the proximal interphalangeal joint stretches or even ruptures the dorsal slip of the extensor hood, allowing dorsal migration of the joint through the discontinuity. A similar process at the carpometacarpal joint of the thumb may give rise to the Z-thumb deformity.

Piano-key sign can be detected when weakening of the distal radio-ulnar ligament by synovitis allows the distal ulna to migrate dorsally so that it overrides the radius (caput ulnae syndrome). The ulna can be depressed by pressure like a piano key (while the patient emits a note!). Progressive distruction of the carpal joints may be followed by volar subluxation and ultimately ankylosis.

Carpal collapse and fusion may accumulate in the disease, particularly in those with an early onset rheumatoid arthritis, when instability of the wrist may lead to collapse of the carpal bones, causing foreshortening of the carpus and, ultimately, spontaneous fusion of the wrist.

Elbows and shoulders

Involvement of the elbows is less common than of the wrist but severe destruction may occur, leading to pronounced deformity and disability.

The radiohumeral joint is more commonly symptomatic than the humero-ulnar joint and presents problems particularly with pronation / supination. Periarticular structures (olecranon bursa, ulnar nerve) may also affected by synovitis and subcutaneous nodules are commonly found on the extensor surface of the forearm close to the elbow.

There may be inflammation of the subacromial bursa or supraspinatus tendon in addition to glenohumeral joint synovitis, producing a typical painful syndrome. Involvement of the acromioclavicular joint can give rise to pain particularly with overhead activities.

Knees

Synovial proliferation is usually most obvious in the suprapatellar pouch and there may be pronounced wasting of the quadriceps as a result of reflex muscle inhibition. Synovial effusion typically produces posterior knee pain in the early stages by stretching the posterior capsule of the joint. This may lead to the development of a popliteal cyst communicating with the joint via a valve-like opening which does not easily allow fluid back into the joint. Rupture of the joint or a popliteal cyst may cause extravasation of highly irritant synovial fluid into the calf where the inflammation and swelling may mimic a deep vein thrombosis. These two pathologies can sometimes coexist because there may be partial obstruction to the venous return by the presence of an extensive popliteal cyst.

Tricompartmental damage to the articular surfaces of the knees is the usual outcome of late disease and may cause severe instability of the joint as the collateral and cruciate ligaments become lax. Valgus deformities of the knees are the usual consequence of loading such unstable joints, and are often combined with a degree of fixed flexion deformity. Pain may also arise from periarticular structures, such as the insertion of the collateral ligaments which are chronically under strain in the unstable knee joint. Even in the end stages of destruction of the knee joint.

Hips

Involvement of the hips in rheumatoid arthritis is relatively uncommon overall. Pain is usually experienced in the groin and the buttock but may radiate to the knee, sometimes mimicking knee arthritis. Rotation and abduction of the hip are reduced before flexion, but ultimately fixed flexion deformity of the joint may occur.

AXIAL SKELETON

Involvement of the sacroiliac joints is rare in rheumatoid arthritis. Spinal arthritis is common, up to 80 per cent of patients demonstrating radiological evidence of the disease in the cervical spine. This may be asymptomatic but the most frequent result is painful limitation of movement, often in several planes. The most common radiological abnormalities consist of osteoporosis, erosion of the zygopophyseal joints, erosions of the vertebral end plates, and loss of disc space in the absence of florid osteophytosis.

There may be evidence of atlantoaxial subluxation in up to 25 per cent of patients. Serious erosive change in the cervical spine is more likely in patients who have pronounced peripheral joint disease.

Other joints

Hoarseness of the voice may occasionally be caused by effusion within the cricoarytenoid joints. Temporomandibular joint disease causes pain on chewing and may particularly restrict opening of the mouth.

Rheumatoid nodules

Subcutaneous and intracutaneous nodules are a hallmark of the disease, occuring in about one-quarter of patients. They are discrete, firm, non-tender swellings varying from a new millimetres to several centimetres in size, and in rare instances, usually seropositive males, they may occur in the absence of typical articular disease (rheumatoid nodulosis). They occur most frequently on the extensor surface of the forearm and olecranon, sites where repeated minor trauma from leaning could initiate their formation. They also commonly occur around tendons, including the Achilles, the flexor and extensor tendons of the fingers, and over the sacrum. Sometimes superficial nodules may break down with ulceration of the surrounding skin.

Histological examination of these nodules reveals central fibrinoid necrosis surrounded by palisades of fibroblasts and chronic inflammatory cells, suggesting a combination of proliferative and destructive tissue responses. Rheumatoid nodules may also develop in many other tissues including the eye (scleromalacia), pleura, pericardium, and parenchyma of the lungs and heart (where they may be found at autopsy in as many as 10 per cent of patients). They sometimes occur on the vocal cords and very occasionally they may cause dysfunction of the heart valves or conducting tissue.

Anaemia

A moderate normochromic normocytic anaemia is an almost invariable finding in active rheumatoid arthritis. In the chronic anaemia of rheumatoid disease the blood picture is usually normocytic and normochromic or hypochromic (but rarely microcytic). Iron-binding capacity is typically reduced in active rheumatoid arthritis; normal or slightly raised levels in the presence of a low serum iron are therefore highly indicative of iron deficiency. In contrast, as part of the acute phase response, ferritin levels are typically elevated in active rheumatoid arthritis unless there is iron deficiency. The typical anaemia of chronic disease seen in rheumatoid arthritis correlates closely with the sedimentation rate as a marker of disease activity and does not respond to iron, folic acid or Vitamin B12.

Platelets:The platelet count is commonly increased increased to a level greater than 5 x 104 in active disease and this may also occur when there is active bleeding from the intestine.

Vasculitis

Vasculitis is more common in patients with high levels of IgM rheumatoid factor and severe joint disease, although the activity of the synovitis and extra-articular disease is often temporally dissociated. Its incidence increase with the duration of the disease, but occasionally it may be present from the outset, even rarely, in the absence of joint disease.

Rheumatoid vasculitis is associated with significant mortality but this can be significantly reduced with appropriate therapy.

Lung involvement

Pleurisy has an incidence of about 1 per cent overall but pleural effusions due to rheumatoid arthritis may go undetected. Pleural involvement is five times more common in men than in women and often needs differentiation from other causes, particularly when other systemic features, such as weight loss and fever, are present. The fluid has raised protein, low glucose, and low complement levels and is typically positive for rheumatoid factor. Pleural biopsy may reveal rheumatoid granulomata, like an **'opened-out rheumatoid nodule'**, but typically there is the appearance of non-specific inflammation which does not allow differentiation from other causes of pleurisy.

Nodules are more common in the upper than the lower zones and may be single or multiple. Cavitation may occasionaly lead to haemoptysis. Pulmonary

fibrosis is common in rheumatoid arthritis but is often subclinical. Ten per cent of patients have radiological evidence of fibrosis and many more have evidence of impaired vital capacity and gas transfer Classical fibrosing alveolitis occurs in 2 % of patients with rheumatoid arthritis and causes progressive, clubbing of the fingers, fine late-inspiratory crepitations, and lower-zone reticulonodular shadowing on the chest radiograph.

Obliterative bronchiolitis is a rare but rapidly progessive and fatal process manifesting with an acute onset of breathlessness. Widespread small airways obstruction is present in the absence of alveolar fibrosis and there is little evidence of inflammation.

Many patients with rheumatoid arthritis have evidence of airways obstruction irrespective of their smoking habits. Bronchiectasis also appears to be more common in those with the disease and to predate its onset.

Valvulitis may be apparent in 20 per cent of cases but is rarely symptomatic during life. Granulomatous thickening of the cusps of the aortic valve occurs more frequently than in the mitral valve but only produces incompetence of the valve. Acute aortic regurgitation following perforation of one of the cusps is described. Autopsy studies reveal a patchy myocardial fibrosis in about one-sixth of patients and myocardial nodules can be found in some patients with small-vessel vasculitis. Myocardial infarction resulting from necrotizing vasculitis during life seems to be very low.

Eyeinvolvement

This is common rheumatoid arthritis and may be due to localized tissue involvement or as part of a more generalized disorder involving the exocrine glands - Sjogren's syndrome. Exceptionally there may be diplopia resulting from stenosing tenosynovitis of the superior oblique tendon (Brown syndrome).

Sjogren's syndrome is characterized by diffuse infiltration of the exocrine glands and other tissues by lymphocytes, resulting in destruction and glandular insufficiency. The syndrome occurs in one- fifth of patients with rheumatoid arthritis (secondary Sjogren's syndrome)

Typical symptoms consist of pain, erythema and grittiness in the eyes, photosensitivity, and stickness associated with adherent strands of mucus. Secondary bacterial infection is relatively common due to the loss of lysozymes, bacteriostatic agents normally present in tears. Corneal damage may occur.

Extraglandular involvement is less common in secondary Sjogren's syndrome than in the primary disease, but half of those with rheumatoid arthritis exhibit at least some degree of parotid gland enlargement. General malaise is common and cutaneous vasculitis, peripheral neuropathy, renal tubular acidosis, interstitial pulmonary fibrosis, and myositis may all coincide.

Episcleritis usually appears as a raised lesion in the anterior sclera with hyperaemia of the deeper layers. The lesions are often transient but may be associated with vasculitis.

Scleritis is less common but potentially more serious since it may lead to progressive thinning of the sclera (scleromalacia) and even perforation. Keratolysis (corneal melting) and limbal guttering are rare complications of vasculitis of the circumcorneal vessels which can also cause perforation.

Peripheral nerve involvement

A mild glove and stocking sensory neuropathy is relatively common in rheumatoid arthritis but is usually benign and does not imply inflammation of nervous tissue. However, there may be lymphocytic infiltrates of the dorsal root ganglia in Sjogren's syndrome. In contrast, the presence of a mixed sensorymotor neuropathy or mononeuritis multiples is indicative of underlying vasculitis of the vasa nervorum.

Muscle involvement

In rheumatoid arthritis muscle involvement is usually attributed to the reflex inhibition and wasting resulting from severe joint pain. Focal lymphocytic infiltration may be present on muscle biopsy, but its relevance to symptoms is in doubt and there is no increase in muscle enzyme concentrations in the serum to suggest active myositis.

Liver involvement

This is evident in about 10 percent of patients with active disease. There may be mild hepatosplenomegaly and asymptomatic elevation of the serum alkaline phosphatase. Minor degrees of fatty change, Kupffer cell hyperplasia, and lymphocytic infiltration of the poral tracts may be seen.

The Felty syndrome

Lymphadenopathy is common in patients with rheumatoid arthritis, biopsies showing nodular hyperplasia. It is most obvious in patients with the Felty syndrome (rheumatoid arthritis, splenomegaly,

and leucopenia). Other extra-articular features are frequently present and include anaemia, thrombocytopenia, persistent vasculitic leg ulceration, cutaneous pigmentation, weight loss, and recurrent infection. It is uncommon (less than 1 per cent of all cases) and rarely develops in patients who have had the disease for less than 10 years.

Investigation

No test is specific for diagnosiing Rheumatoid arthritis,

A. Haematological:

1. ESR - Increased in active stage.

2. Serum proteins - Hyperglobulinaemia with elevation of Gamma and Alpha 2 globulins hypoalbuminaemia during acute phase and C-reactive protien (CRP)

WBC count is usually normal, but a mild leucocytosis may be present. Eosinophilia when present usually reflects severe systemic disease.

B. Immunological:

I. Rheumatoid Factor (RF):

- Latex screening positive
- Latex test positive
- Sheep Caps Agglutination Test (Roose Waaler) (SCAT)
- Differential Agglunination Test (DAT)
- Human Erythrocyte Agglutination Test (HEAT)

Rheumatoid Factor (RF) is an auto antibody (Antibody directed against an organism's own tissues). It is an antibody against the Fc portion of IgG, which is itself an antibody.

Rheumatoid Factor (RF) is evaluated in patients suspected of having any form of arthritis even though positive results can be due to other causes, and negative results do not rule out the disease, but in combination with signs and symptoms.

Immunological

The amount of Rheumatoid factor in blood can be measured by,

- **Agglutination Test:** Blood is mixed with tiny rubber (latex) beads that are covered with human antibodies. If rheumatoid factor is present, the latex beads clump together (agglutinate). Normal Titre is 1:20 - 1:40 or less Rheumatoid arthritis, titre is greater than 1:20 - 1:40.

Auto antibodies other than Rheumatoid Factor in Rheumatoid Arthritis.

- Antiperinuclear factor
- Antikeratin antibodies
- Antibodies to cyclic citrullinated peptide (CCP)
- Antibodies to SA, p6 and calpastatin.

Of this Anti-CCP Antibodies stand out as the most useful clinically, especially in defining Rheumatoid arthritis in early stages.

Rheumatoid Factor (RF) may also be elevated in

Chronic hepatitis, Any chronic viral infection, Leukemia, Dermatomyositis, Systemic lupous erythematosus (SLE), Infectious mononucleosis and Systemic sclerosis.

II. Anti Nuclear Antibodies:

- **Synovial fluid analysis** confirms the presence of inflammatory arthritis. Fluid may show positive Roose - Waaler test in joint fluid, before it can be detected in blood. Also it may show neutrophils or monocytes inclusion bodies.

III. Synovial biopsy:

- Villus formation with thickening of synovial layer and infiltration with abnormal cells.

IV. Radiographic Evaluation:

- Soft tissue swelling
- Juxta articular osteoporosis
- Erosion of joints margins
- Joint spaces are decreased
- Deformities
- Atlanto-axial subluxation
- Subchondral erosions and cyst formation
- Fibrous and bony ankylosis develops in the late stages.

V. Arthroscopy:

In acute Rheumatoid Arthritis synovium is oedematous, diffusely erythematous and friable. In more chronic conditions it becomes thickened.

VI. Renal Biopsy:

Indicated in cases of reduced tubular or glomerular function.

VII. Pulmonary Biopsy:

Used to distinguish Rheumatoid nodules from carcinoma or to establish diagnosis of fibrosing alveolitis.

VIII. Ultra Sound

IX. Scintigraphy

X. CT Scanning

Shows cartilage and sub-chondral bone damage long before conventional x rays.

XI. MRI

XII. Urine analysis

XIII. Biochemical analysis XIV. Anti CCP antibodies
(Cyclic citrullinated peptide antibodies)

XV. Genetic tests
HLADRB1 Typing to detect the presence of 'Shared epitope'.

XVI. Antinuclear antibody assay (ANA)

XVII. Bone density test to check for bone loss

Patients treated by simple methods show that after 10 years 50% will have improved and 50% deteriorated. Remissions of disease activity are most likely to occur during the first year. The median life expectancyof persons with Rheumatoid arthritis is shortened by 3 to 7 years.

DIFFERENTIAL DIAGNOSIS OF RHEUMATOID ARTHRITIS

Sero negative spondyloarthropathy included following Rheumatoid like conditions were the serum is negative for Rheumatoid factor. They are,

1. Ankylosing spondylitis:

Ankylosing spondylitis is a chronic, progressive and crippling disease affecting the spine. The exact etiology is unclear. Ankylosing spondylitis has been found to be more prevalent in certain races and hence shows a genetic predisposition. It is related to certain tissue types of the human leukocytic antigen (HLA) system. The majority of ankylosing spondylitis patient is to belong to HLA-B27 groups.

The disease occurs in the 3rd and 4th decades of life and is more common in males. The patients present with complaints of diffuse pain in the back and vague pain in other joints.

2. Reiter's disease:

Reiter's disease characterised by triad of polyarthritis, urethritis, conjunctivitis. The joint condition is an acute polyarthritis resembling Rheumatoid arthritis. It does not cause destructive changes in the joint structures. The urethritis is non-gonococcal but the exact organism is not known.

3. Psoriatic arthritis:

Psoriatic arthritis is a polyarthritis seen in about 10% of patients with psoriasis.

- The most common type is the one involving the **distal interphalangeal joints** of the hands and feet with psoriatic nail joints. Metacarpophalangeal joints are never involved in psoriatic arthritis.
- Arthritis multilens is a severe form where there is marked destruction of joints.
- Symmetrical polyarthritic type
- Oligo arthritic type
- Spondyloarthritic type.

1. Enteropathic arthritis:

Chronic inflammatory bowel disease like regional enteritis (Crohn's disease) and ulcerative colitis are associated with arthritic lesion in about 10% of the cases. There is peripheral involvement of the spine. The joint condition shows remissions and exacerbations along with activity of the underlying bowel disease.

2. Sjogren's Syndrome:

Approximately 10 to 15% of patients with Rheumatoid arthritis, mostly women develop **Sjogren's syndrome**, a chronic inflammatory disorder characterised by lymphocytic infiltration of lacrimal and salivary glands. This leads to impaired secretion of saliva and tears and results in the sicca complex: dry mouth (xerostomia) and dry eyes (keratoconjunctivitis sicca).

Patients with Sjogren's syndrome have a variable expression of disease in other exocrine glands. This is manifested clinically as dry skin, decreased perspiration, dry vaginal membranes, or a nonproductive cough.

Commonly, there is also a polyclonal lymph proliferative reaction characterised by lymphadenopathy and spleenomegaly. This can mimic and rarely transform into a malignant lymphoma.

Clinical manifestations:

- Keratoconjuctivitis and Xerostomia
- Renal involvement produces mild interstitial nephritis that may result in renal tubular acidosis.
- Sensory polyneuropathy and mononeuritis multiplex.
- Pulmonary involvement generally takes the form of an interstitial pneumonitis which is usually a little clinical significance.

Complications

1. Amyloidosis:

It is a complication of prolonged active disease and is formed in 25% to 35% of patients at autopsy, making Rheumatoid Arthritis a leading cause of secondary amyloidosis.

2. Fixed deformities:

The perils often the common place ones resulting from ignorance and neglects. Early assessment and planning should prevent postural deformities that will result in joint contractures.

3. Muscle weakness:

Even mild degree of myopathy or neuropathy when combined with prolonged inactivity may lead to profound muscle wasting and weakness. This should be prevented by physiotherapy and pain control if possible.

4. Joint rupture:

Occasionally the joint lining ruptures and synovial contents spill into the soft tissue.

5. Systemic vasculitis:

This is a rare but potentially serious complication.

MANAGEMENT

Treatment

Treatment has five main aims.

- Relief of pain
- Reduction of inflammation
- Minimizing undesirable side effects
- Preservation of muscle strength and joint function
- Return as rapidly as possible to a normal life style.

A variety of physical therapy modalities may be useful in decreasing the symptoms of Rheumatoid Arthritis. Exercise is directed at maintaining muscle strength and joint mobility.

Drug Therapy:

The drugs used are as follows:

1. Non-steroidal anti-imflammatory drugs (NSAIDs)
2. Disease modifying antirheumatoid drugs (DMARDs)
   - Methotrexate
   - Gold
   - Penicillamine Antimalarials
   - Sulphasalazine
3. Steriods
4. Cytotoxic drugs
   - Azathioprine
   - Leflunomide
   - Cyclosporine
   - Cyclophosphamide
5. Newer drugs
   - TNF receptor antogonist – etanarcept
   - TNF receptor antibody – infliximab
   - IL-1 receptor antagonist - anakinra

Surgical Treatment

- Synovectomy
- Osteotomy
- Arthroplasty
- Excision arthroplasty
- Replacement arthroplasty
- Arthrodesis
- Tendon transfer operation for correcting deformities
- Excision of the metacarpophalangeal joints in case of gross deformities

4. MATERIALS AND METHODS

The Study on Uthiravatha Suronitham was carried out in the OPD and IPD of the Sirappu Maruthuvam department, Govt. Siddha Medical College, Palayamkottai.

The trial drugs used are **Keelvayu nivarana chooranam** (Internal) indicated in the authorised Siddha text The pharmacopoeia of siddha research medicines (Page No.183) and **Vathathirku thylam (**page No.83) (External) indicated in Theraiyar vagadam for Uthiravatha Suronitham.

OBJECTIVES:

Primary objective:

To evaluate the clinical efficacy of "**KEELVAYU NIVARANA CHOORANAM** " (internal) & "**VATHATHIRKU THYLAM"** (external) in reducing the pain and restricted joint movements in the treatment of **'Uthiravatha suronitham"** (rheumatoid arthritis).

Secondary objective:

To study the effect of Vedhu (steam bath) in reducing the pain towards the efficacy of medicine.

Study design & conduct of study:

Study type	:	Phase II Criteria based open clinical trial
Study place	:	OPD & IPD of Govt Siddha Medical College & Hospital, Palayamkottai
Study period	:	18 months
Treatment :		
Internal medicine	**:**	**KEELVAYU NIVARANA CHOORANAM**
Reference	:	The Pharmacopoeia of siddha research medicines Pg No:98
Dose	:	10-20 grains(650mg- 1300mg), twice a day.
Vehicle	:	-
Duration	:	40 days
External medicine	**:**	**VATHATHIRKU THYLAM**
Reference	:	Theraiyar Vagadam Pg.no 83

Subject selections:

Patients reporting with symptoms of inclusion criteria in P.G. Dept of Sirappumaruthuvam, GSMC, Palayamkottai will be subjected to screening test and documented using screening proforma.

Inclusion criteria:

- Age : 18-60 years
- Sex : both male and female
- Symmetrical joint involvement
- Arthritis of 3 or more joints
- Rheumatoid factor positive or negative
- Morning stiffness
- Swelling especially in the inter phalangeal joint.
- Patients who are willing for admission and stay in IPD for 40 days or willing to attend OPD
- Patient who is willing to undergo radiological investigation and give blood and urine samples for laboratory investigation.
- Patient willing to sign the informed consent stating that he/she will consciously stick to the treatment during 40 days but can OPD out of the trial of his/her own conscious discretion.

Exclusion criteria:

- Systemic illness.
- Pregnancy and lactation
- History of trauma
- Neurological disorder
- Tubercular arthritis
- Any other serious illness
- Psoriatic arthritis
- Gouty arthritis

Withdrawal criteria:

- Intolerance to the drug and development of adverse reactions during drug trial.
- Poor patient compliance and defaulters.
- Patient turned unwilling to continue in the course of clinical trial.
- Occurrence of any adverse reactions.

Tests and assessment:

A. Clinical assessment
B. Routine investigations
C. Specific investigations
D. Radiological investigations
E. Siddha investigations

A. Clinical assessment:

- Arthritis involving three or more joints.
- Symmetrical joint involvement
- Morning stiffness
- Anorexia
- Spindle shaped appearance of fingers
- Rheumatoid nodules
- Depression
- Distaste to food
- Swelling of small joints of hands and foot.

B. Routine investigation:

Blood

Hb

Total WBC count

DC –

1. Polymorphs
1. Lymphocytes
2. Eosinophils
3. Monocytes
4. Basophils

Total RBC count

ESR

½ hr

1 hr

Blood sugar

r:

f:

pp:

Serum cholesterol.

Urine

Albumin

Sugar

Deposit

C. Specific investigations

CRP

RA factor

ASO titer

D. Radiological investigations:

X ray of affected joints (AP and lateral view)

E. Investigation based on siddha system:

1. Naa
2. Niram
3. Mozhi
4. Vizhi
5. Naadi
6. Sparisam
7. Malam
8. Moothiram

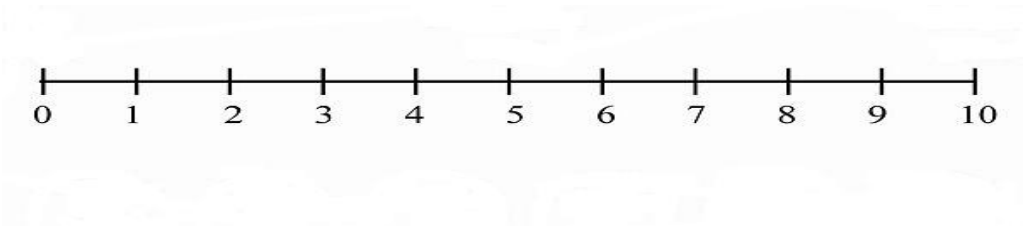
Conduction of the study:

15ml of Vellai ennai is given in early morning, on the very first day of treatment for purgation. This will help to bring the vitiated mukkutram back to normal. From the next day, the trial drug is given for treatment.

Then the trial drug **KEELVAYU NIVARANA CHOORANAM** (internal), **VATHATHIRKU THYLAM** (external) is given continuously for 40 days. OP patients should visit the hospital once in seven days. At each clinical visit clinical assessment is done and prognosis is noted. For IP patients the drug is given for 40 days and the clinical assessment is done daily. 10 IP patients will be given Vedhu (steam bath) treatment along with their internal medicine. The remaining 10 IP patients will not be given Vedhu (steam bath). The results will be compared at the end of the study. Laboratory investigations & radiological investigation are done 0 day, 20^{th} day, 40^{th} day of the trial. For IP patients, who are not in a situation to stay in the

hospital for a long time is advised to attend the OPD for further follow-up. After the end of the treatment, the patient is advised to visit the OPD for another 2 months for follow-up. If any trial patient who fails to collect the trial drug on the prescribed day but wants to continue in the trial from the next day , he/she will be allowed, but defaulters of one week and more will not be allowed to continue and be withdrawn from the study with a fresh case being included.

Outcome:



The outcome is aimed at reducing the pain and weakness.

Universal pain assessment scale

A. 0 : no pain

B. 1 -3 : mild pain

C. 4-6 : moderatepain

D. 7-10 : severepain

Reference: clinical manual for nursing practice. (National institute of health warren grant magnuson clinical center) Restricted movements is assessed by

Gradation of restricted movements:

- G i – able to perform normal duties
- G ii – moderate restriction – self care is possible.
- G iii – marked restriction – limited self care / some assistance required.
- G iv – confined to bed or wheel chair.

Adverse effect/serious effect management

If the trial patient develops any adverse reaction, he/she would be immediately withdrawn from the trial and proper management will be given in OPD of Govt. Siddha medical college and hospital, Palayamkottai.

4. RESULTS AND OBSERVATION

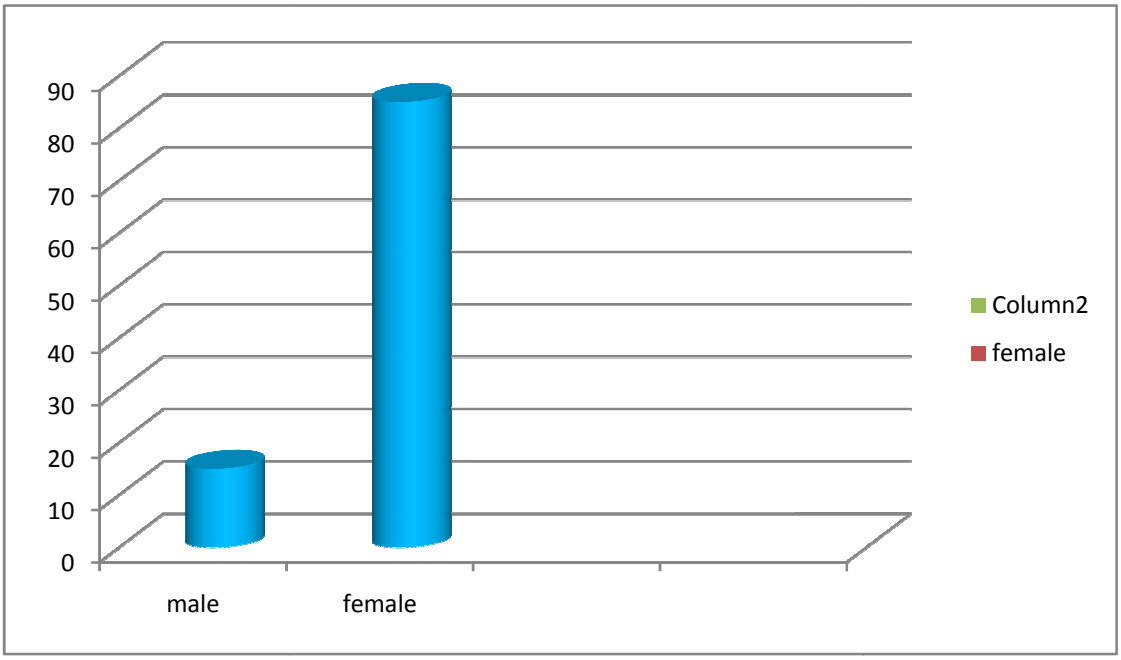
For the clinical study 40 patients were selected and treated in PG-III SirappuMaruthuvam Department, Government Siddha Medical College and Hospital, Palayamkottai. Results were observed with respect to the following criteria.

1. Gender distribution
2. Age distribution
3. Kaalam
4. Occupation
5. Seasonal Variations
6. Thinai
7. Socio-economic status
8. Directory habits
9. Mode of onset
10. Duration of conditions
11. Clinical symptoms
12. Deformity
13. Involvement of joints
14. Conflict in Kanmathiriam
15. Disturbance in Vatham
16. Disturbance in Pitham
17. Disturbance in Kabam
18. Disturbance in UdalKattugal
19. Envagaithervugal
20. Naadi
21. Neikuri
22. Assessment of results by the effect of conbined therapy.

1. GENERAL DISTRIBUTION

Table : 1

S.No	Gender	No. of Cases	Percentage (%)
1	male	6	15
2	female	34	85
	Total	**40**	**100**



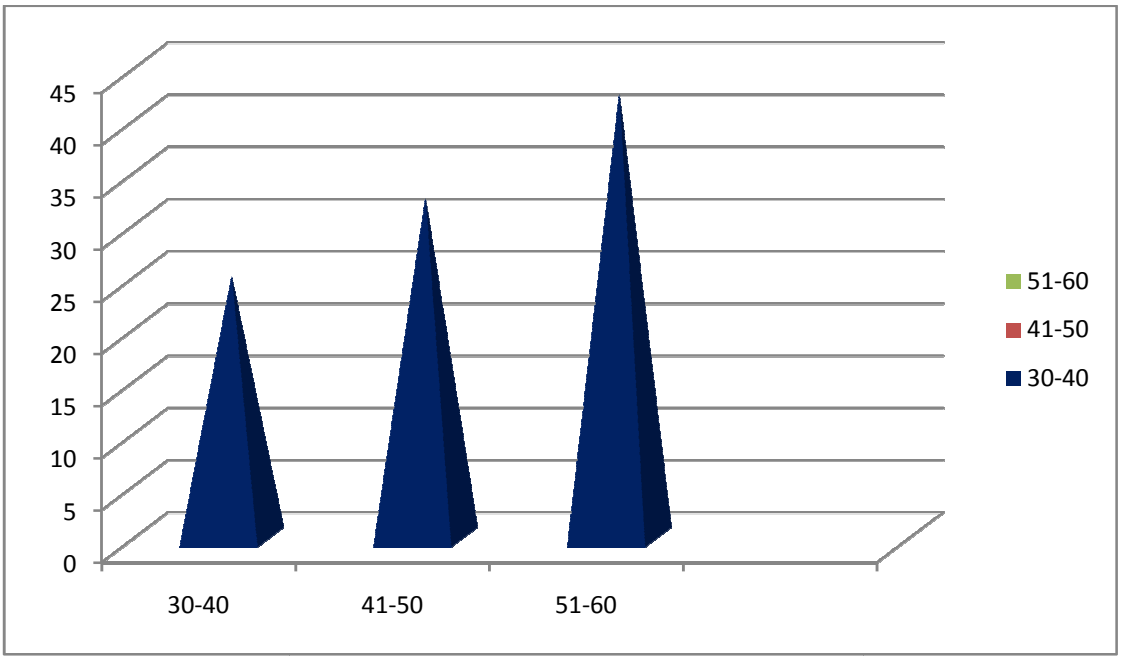
Inference:

Among 40 patients selected for this study. 85% are female and 15% are male.

2. AGE DISTRIBUTION

Table : 2

S.No.	Age Year	No. of Cases	Percentage (%)
1	30-40	10	25
2	41-50	13	32.5
3	51-60	**17**	42.5
	Total	**40**	**100**



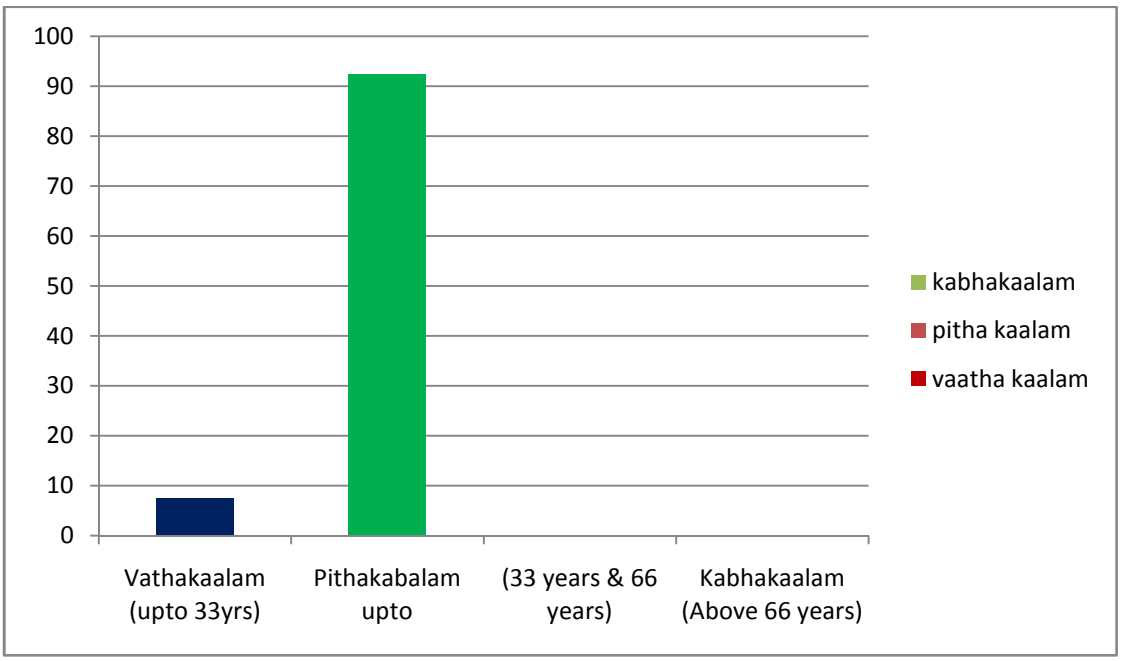
Inference:

The prevalence of the diseases is found to be higher in the age group of 51-60 years(42.5%).

3. KAALAM

Table : 3

S.No.	Kaalam	No. of Cases	Percentage (%)
1	Vathakaalam (upto 33yrs)	3	7.5
2	Pithakabalamupto (33 years & 66 years)	37	92.5
3	Kabhakaalam (Above 66 years)	0	0
	TOTAL	**40**	**100**



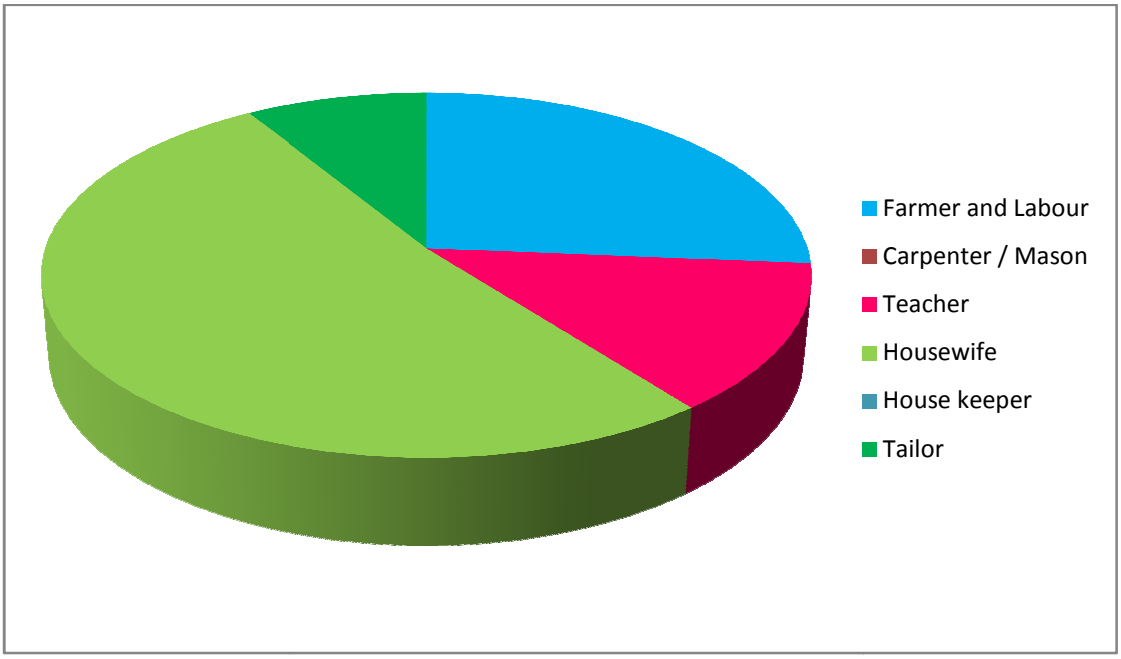
Inference:

Out of 40 cases, 92.5% of cases were founded to be in pithakaalam. 7.5% of cases were found to be in Vadhakaalam.

4. OCCUPATION

Table : 4

S.No.	Occupation	No. of Cases	Percentage (%)
1	Farmer and Labour	6	15
2	Carpenter / Mason	0	0
3	Teacher	3	7.5
4	Housewife	29	29.5
5	House keeper	0	0
6	Tailor	2	5
	Total	**40**	**100**



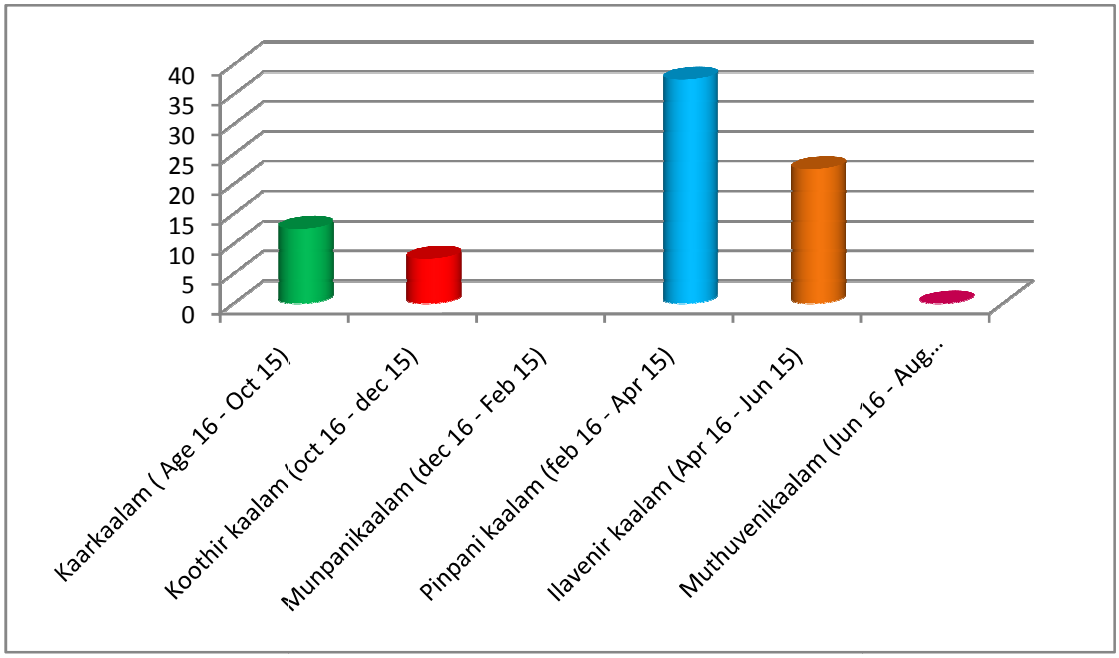
Inference:

Out of 40 cases, in this study the rate of incidence is higher in occupational group which includes House Wife 72.5%,Farmers and Labour 15%, Teachers 7.5% and Tailor 5%.

5. SEASONAL VARIATIONS

Table : 5

S.No.	Seasons	No. of Cases	Percentage (%)
1	Kaarkaalam (Age 16 - Oct 15)	5	12.5
2	Koothirkaalam (oct 16 - dec 15)	3	7.5
3	Munpanikaalam (dec 16 - Feb 15)	15	37.5
4	Pinpanikaalam (feb 16 - Apr 15)	9	22.5
5	Ilavenirkaalam (Apr 16 - Jun 15)	0	0
6	Muthuvenikaalam (Jun 16 - Aug 15)	8	20
	Total	**40**	**100**



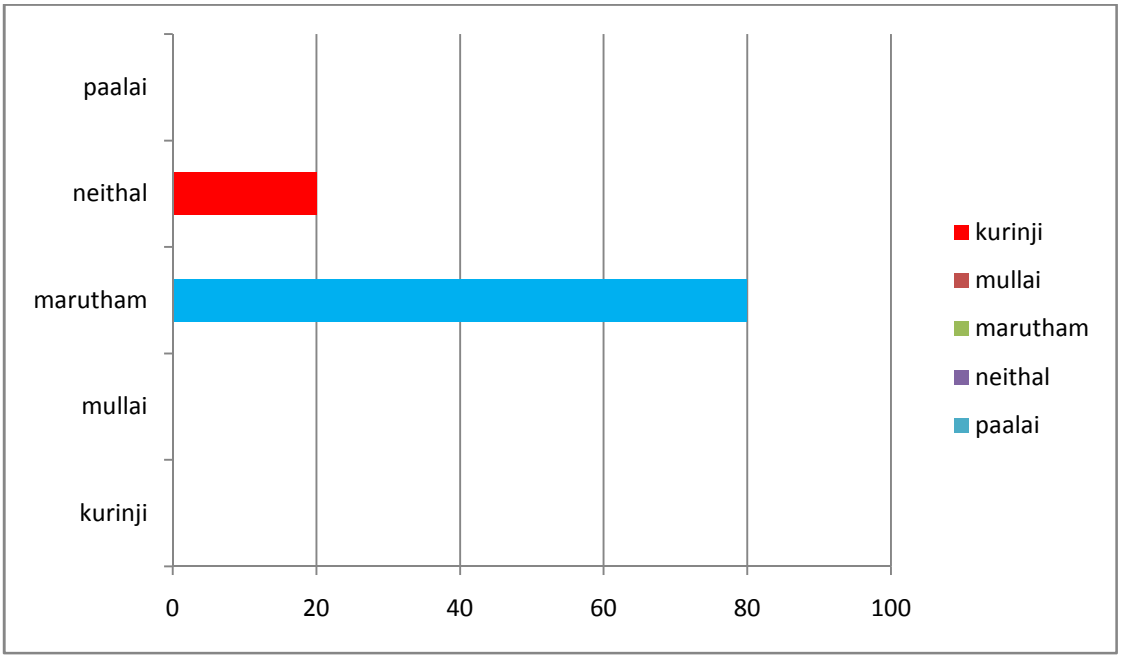
Inference:

Out of 40 cases, 37.5 patients were admitted in munpanikaalam, 22.5% of patients were admitted in pinpanikaalam, 20% of patients were admitted inmuthuvenilkaalum, 12.5% of patients were admitted in Kaarkaalam, 7.5% of patients were admitted in munpanikaalum.

6. THINAI

Table : 6

S.No.	Seasons	No. of Cases	Percentage (%)
1	Kurinji (Hill area)	0	0
2	Mullai (Forest area)	0	0
3	Marutham (Fertile area)	32	80
4	Neithal (Coastal area)	8	20
5	Paalai (Desert land)	0	0
	TOTAL	**40**	**100**



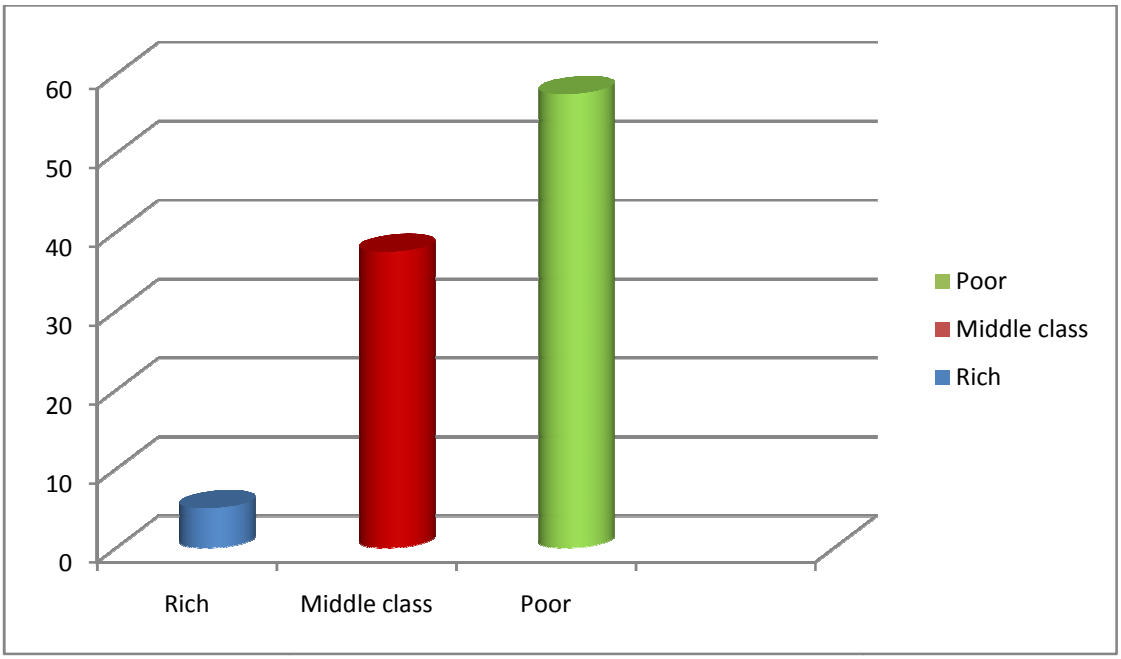
Inference:

Among 40 cases, majority were from MaruthaNilam (80%

7. SOCIO ECONOMIC STATUS

Table : 7

S.No.	Class	No. of Cases	Percentage (%)
1	Rich	2	5
2	Middle class	15	37.5
3	Poor	23	57.5
	Total	**40**	**100**



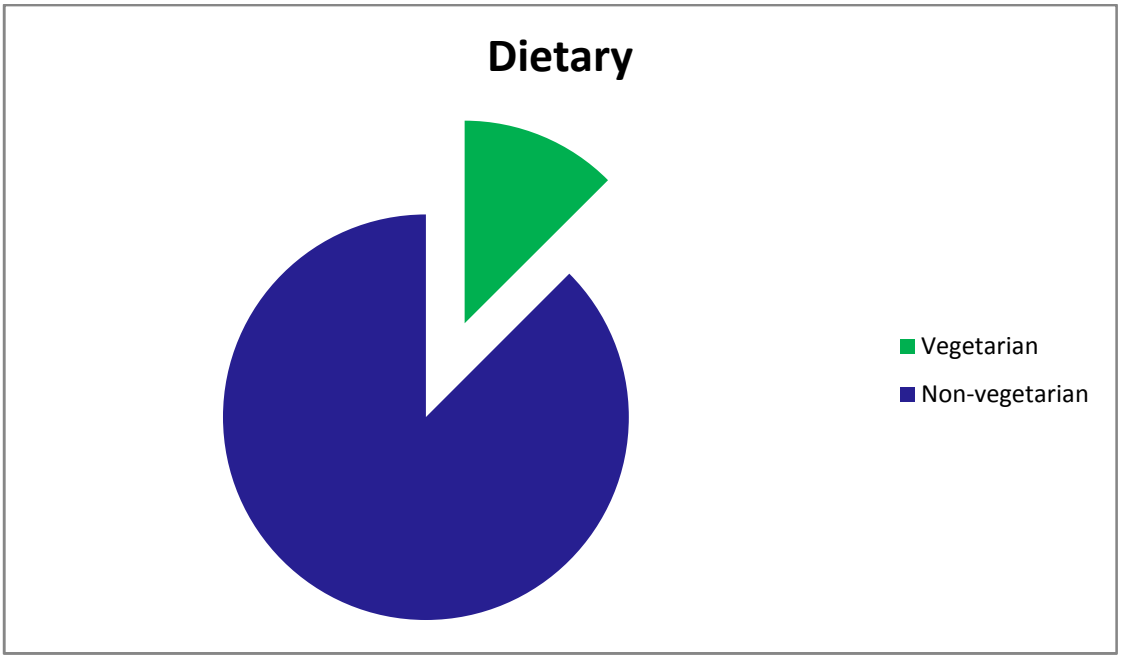
Inference:

Out of 40 cases, 57.5% cases were from poor socio-economic status, 37.5% of cases from middle class and only 5% of cases from Rich background.

8. DIETARY HABITS

Table : 8

S.No.	Dietary	No. of Cases	Percentage (%)
1	Vegetarian	5	12.5
2	Non-vegetarian	35	87.5
	TOTAL	**40**	**100**



Inference:

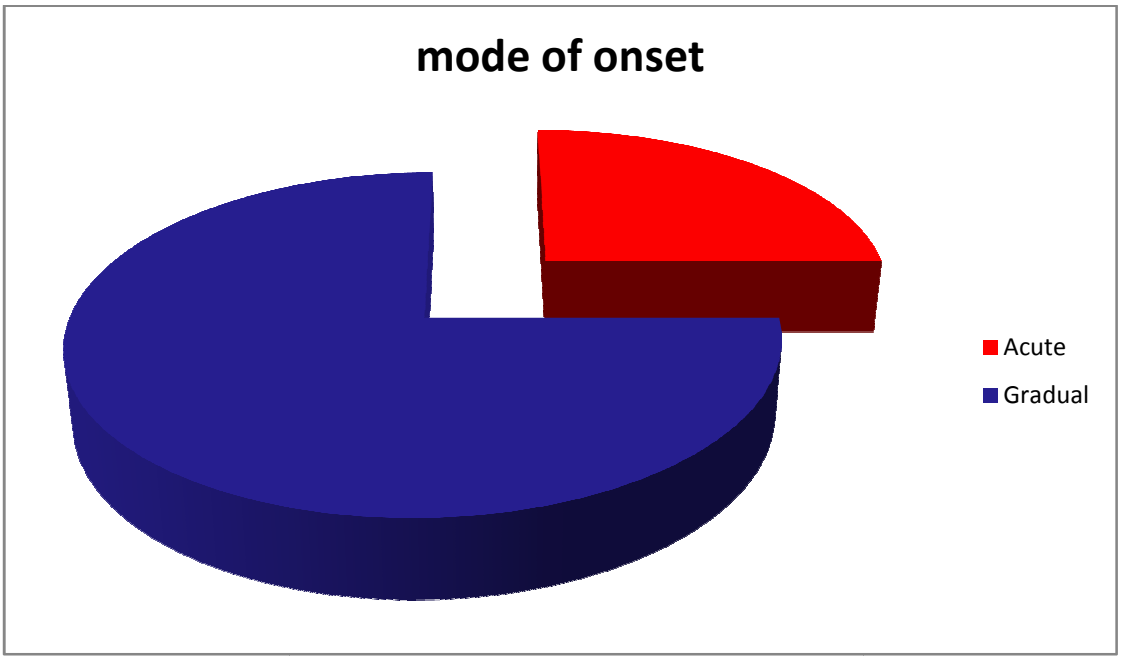
Most of the cases have non-vegetarian diet habit (87.5%)

9.MODE OF ONSET:

Table : 9

S.No.	Mode of Onset	No. of Cases	Percentage (%)
1	Acute	10	25
2	Gradual	30	75
	Total	**40**	**100**

Fig 5.9



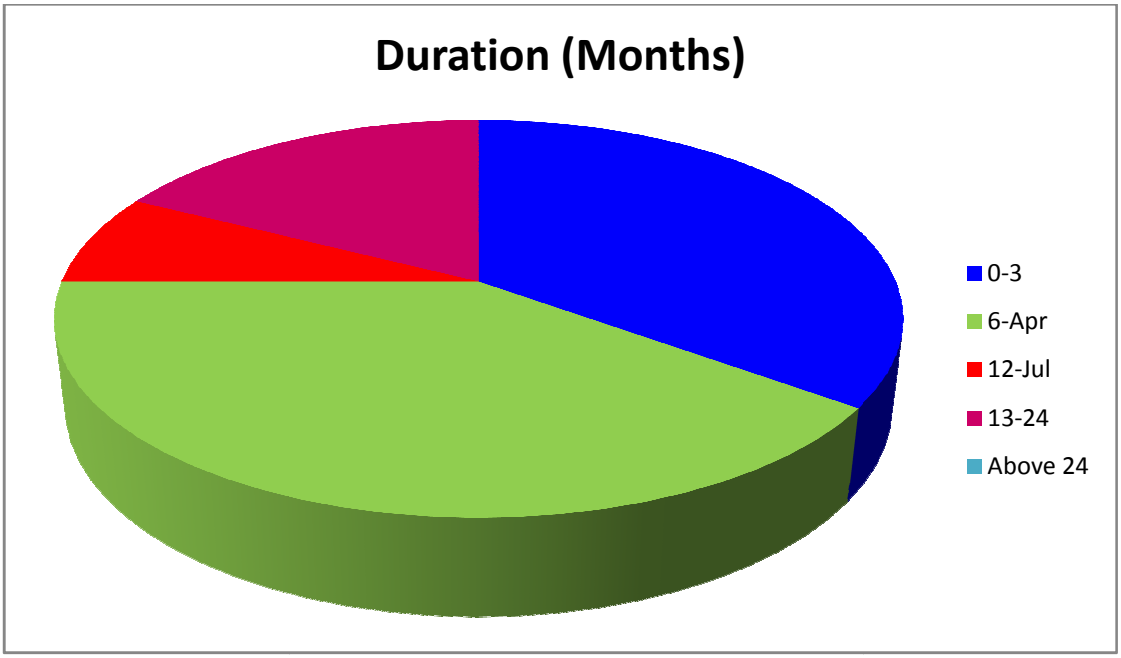
Inference:

According to this study 75% of the cases were reported gradual onset of disease.

10. DURATION OF CONDITIONS:

Table : 10

S.NO	Duration (Months)	No. of Cases	Percentage (%)
1	0-3	14	35
2	4-6	16	40
3	7-12	3	7.5
4	13-24	7	17.5
5	Above 24	0	0
	Total	40	100



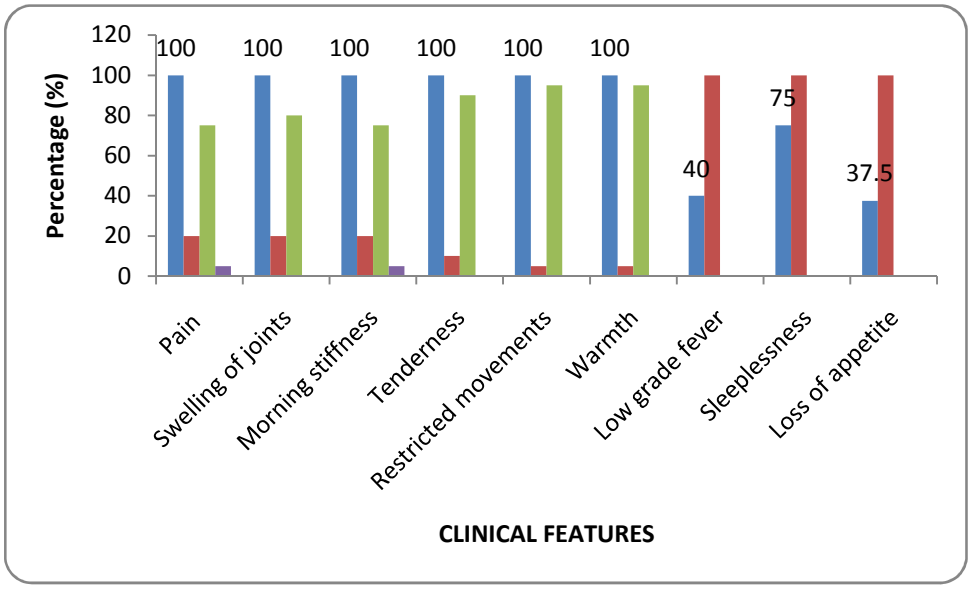
Inference:

Among the 40 cases, 14 cases (35%) were come under 0-3 months, 16 cases (40%) were come under 4-6 months, 3 cases (7.5%) were come under 7-12 months, 7 cases (17.55%) were come under 13-24 months

11. CLINICAL SYMPTOMS (BEFORE AND AFTER TREATMENT)

Table : 11

S. No	Clinical features	Before treatment		After treatment					
		No. of cases	%	Releived	%	Reduced	%	No improvement	%
1.	Pain	40	100	8	20	30	75	2	5
2.	Swelling of joints	40	100	8	20	32	80	0	0
3.	Morning stiffness	40	100	8	20	30	75	2	5
4.	Tenderness	40	100	4	10	36	90	0	0
5.	Restricted movements	40	100	2	5	38	95	0	0
6.	Warmth	40	100	2	5	38	95	0	0
7.	Low grade fever	15	40	15	100	0	0	0	0
8.	Sleeplessness	30	75	30	100	0	0	0	0
9.	Loss of appetite	15	37.5	15	100	0	0	0	0



Inference:

Pain, swelling of joints, morning stiffness, tenderness, restricted movement and warmth were found in all the 40 patients before treatment.

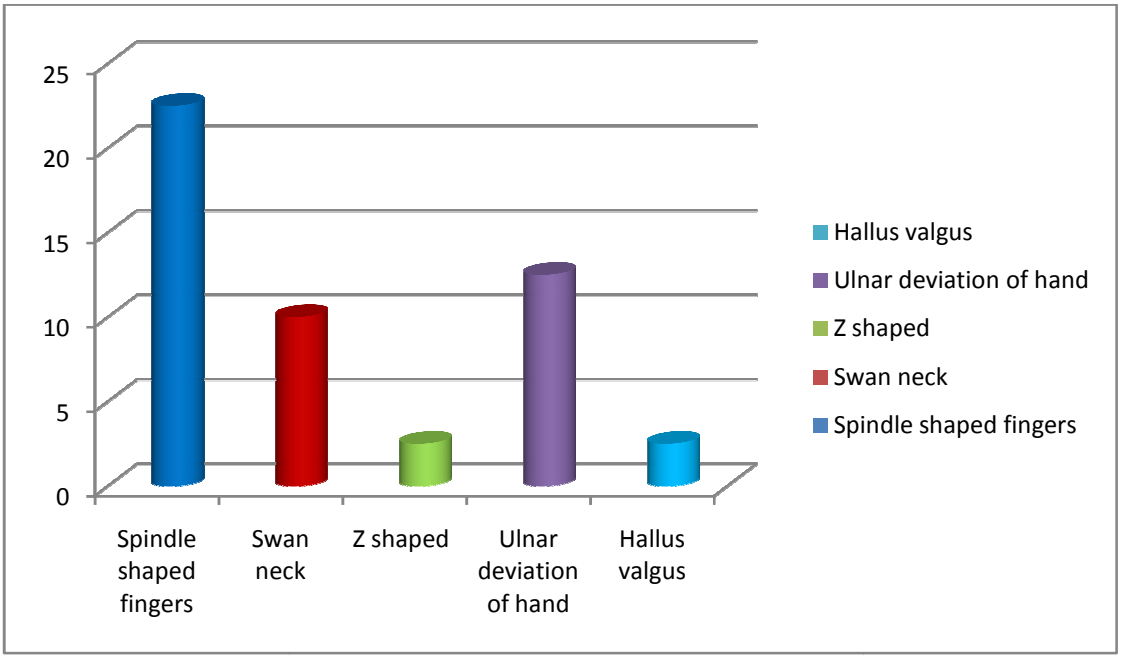
After treatment there was a considerable reduction in all symptoms particularly in pain, morning stiffness, swelling of joints, tenderness, restricted movements and warmth.

After treatment there was a complete relief in the symptoms like low grade fever, sleeplessness and loss of appetite.

12. DEFORMITIES

Table : 12

S.No.	Deformity	Number of cases	Percentage
1.	Spindle shaped fingers	9	22.5
2.	Swan neck	4	10
3.	Z shaped	1	2.5
4.	Ulnar deviation of hand	5	12.5
5.	Hallus valgus	1	2.5



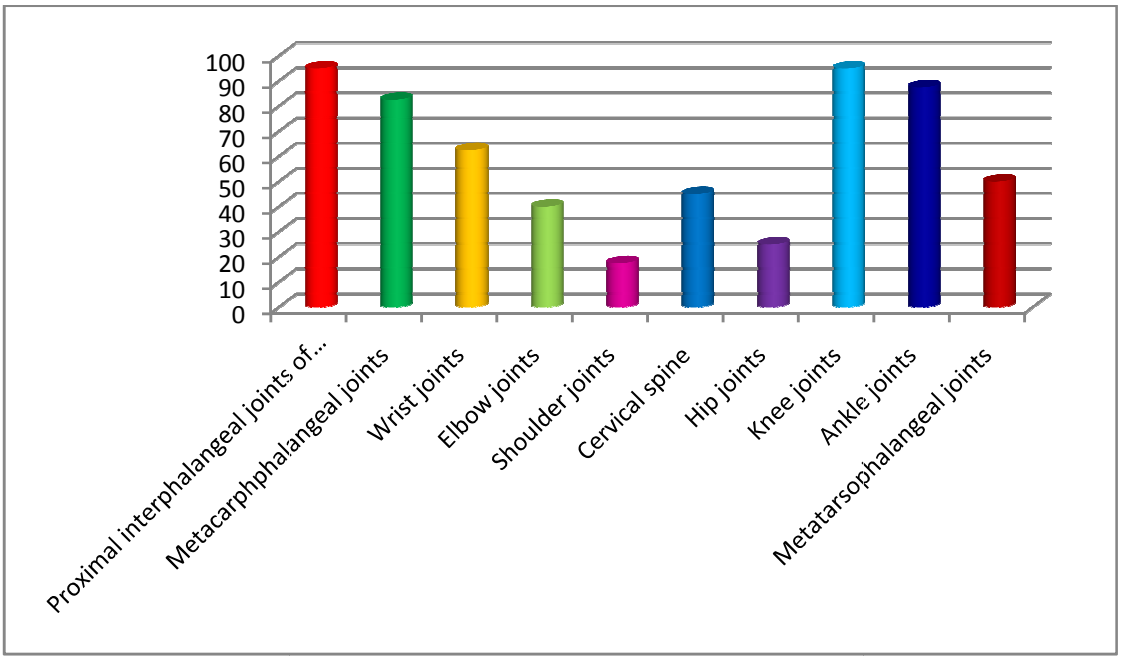
Observation

Among the 40 patients,22.5% cases hand spindle shaped fingers, 12.5% cases had ulnar deviation of hand,2.5% cases had hallusvalgus ,10% cases had swan neck deformity,and 2.5 cases had z shaped deformity.

13: INVOLVEMENT OF JOINTS

Table : 13

S.No.	Joints involved	Number of cases	Percentage
1.	Proximal interphalangeal joints of	38	95
2.	Metacarphphalangeal joints	33	82.5
3.	Wrist joints	25	62.5
4.	Elbow joints	16	40
5.	Shoulder joints	7	17.5
6.	Cervical spine	18	45
7.	Hip joints	10	25
8.	Knee joints	38	95
9.	Ankle joints	35	87.5
10.	Metatarsophalangeal joints	20	50

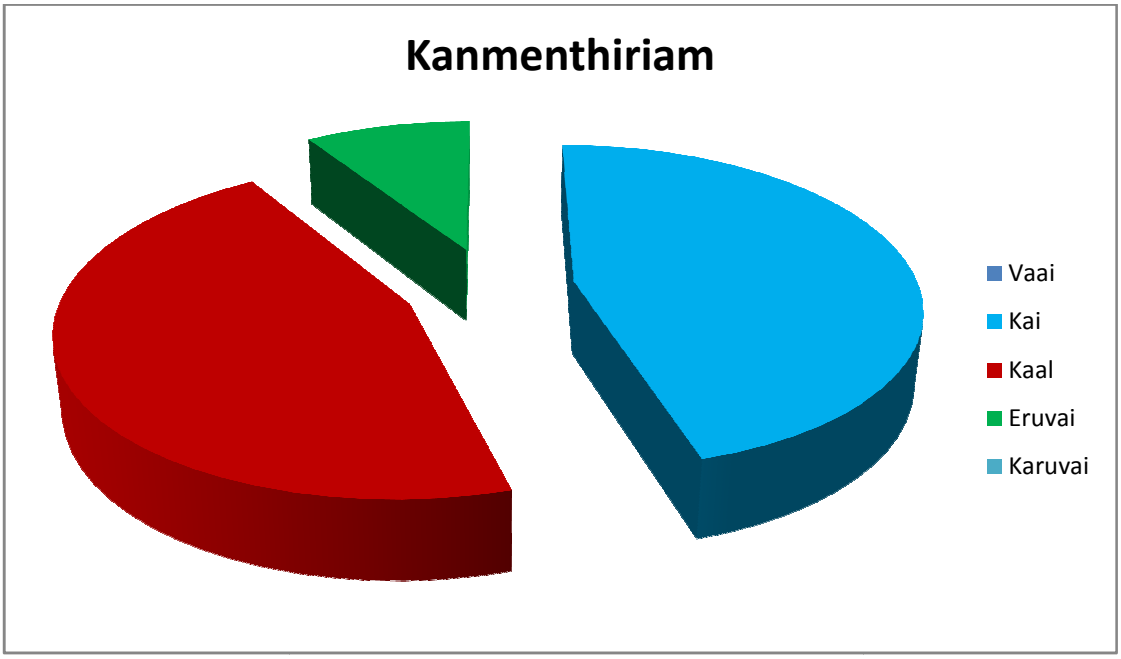


Among the 40 cases 95% had knee joints, 95% of the cases had proximal interphalangeal joint,87.5% had ankle joints, and 82.5% metacarpophalangeal joints, 62.5% had wrist joints, 45% had cervical spine, 40% had elbows, 25% had hip joints, 17.5 %had shoulder joints and 50% had meta tarsophalangea

14. CONFLICT IN KANMENTHIRIAM:

Table : 14

S.No.	Kanmenthiriam	No. of Cases	Percentage (%)
1	Vaai	0	0
2	Kai	40	100
3	Kaal	40	100
4	Eruvai	8	20
5	Karuvai	0	0
	TOTAL	**40**	**100**



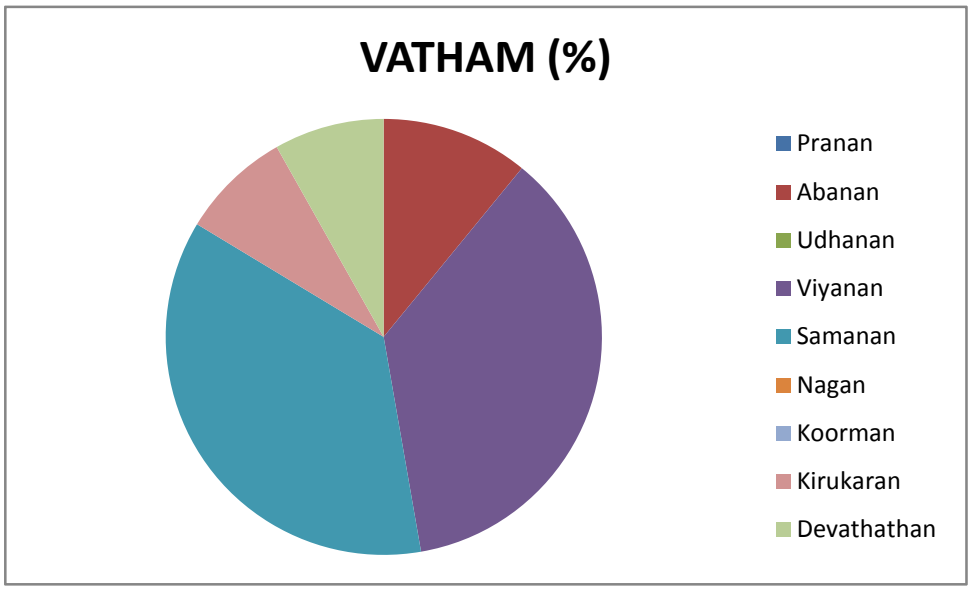
Inference:

Among all the Kanmenthiriam (Vaai, Kai, Kaal, Kruvai, Karuvai)Kai and Kaal were affected in all 40 cases (100%) and Eruvai was affected in 8 cases (20%)

15: DISTURBANCES IN VATHAM:

Table : 15

S.No.	Vatham	No. of Cases	Percentage (%)
1	Pranan	20	50
2	Abanan	8	20
3	Udhanan	21	52.5
4	Viyanan	40	100
5	Samanan	40	100
6	Nagan	5	12.5
7	Koorman	0	0
8	Kirukaran	9	22.5
9	Devathathan	9	22.5
10	Dhananjeyan	0	0



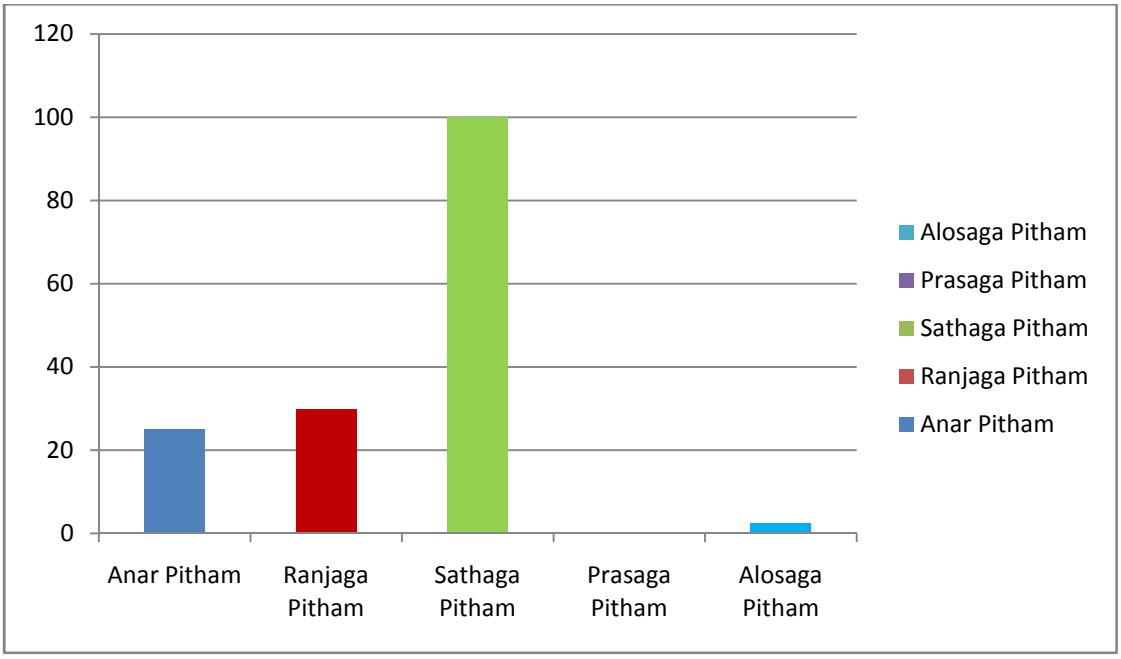
Inferences:

Viyanan and Samanan were affected in all the 40 cases (100%), Udhanan were affected in 21 cases(52.5%), pranan were affected in 20 cases (50%) Abanan were affected in 8 cases (20%) Kirukaran and Devathathan affected in 9 cases (22.5%)

16.DISTURBANCES IN PITHAM

Table : 16

S.No.	Duration (Months)	No. of Cases	Percentage (%)
1	AnarPitham	10	25
2	RanjagaPitham	12	30
3	SathagaPitham	40	100
4	PrasagaPitham	0	0
5	AlosagaPitham	1	2.5



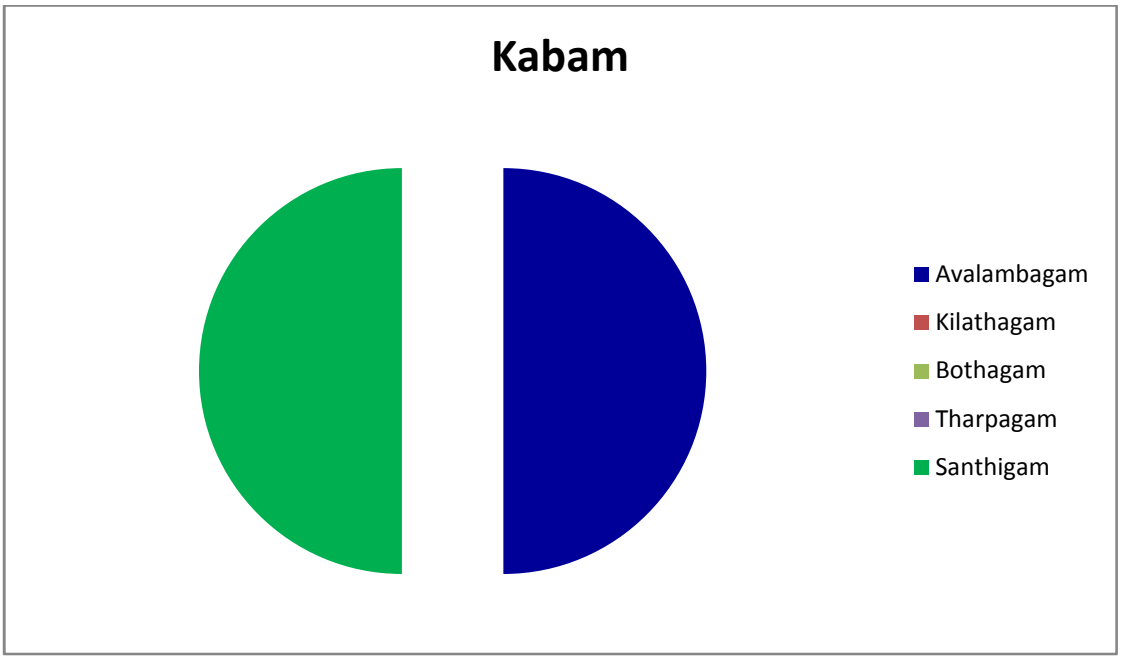
Inference:

SathgaPitham was affected in all the 40 cases (100%) Ranjagapitham was affected in 12 cases (30%), Anarpitham was affected in 10 cases (25%) Alosagam was affected in I case(2.5%)

17. DISTURBANCE OF KABAM:

Table : 17

S.No.	kabam	No. of Cases	Percentage (%)
1	Avalambagam	40	100
2	Kilathagam	0	0
3	Bothagam	0	0
4	Tharpagam	0	0
5	Santhigam	40	100



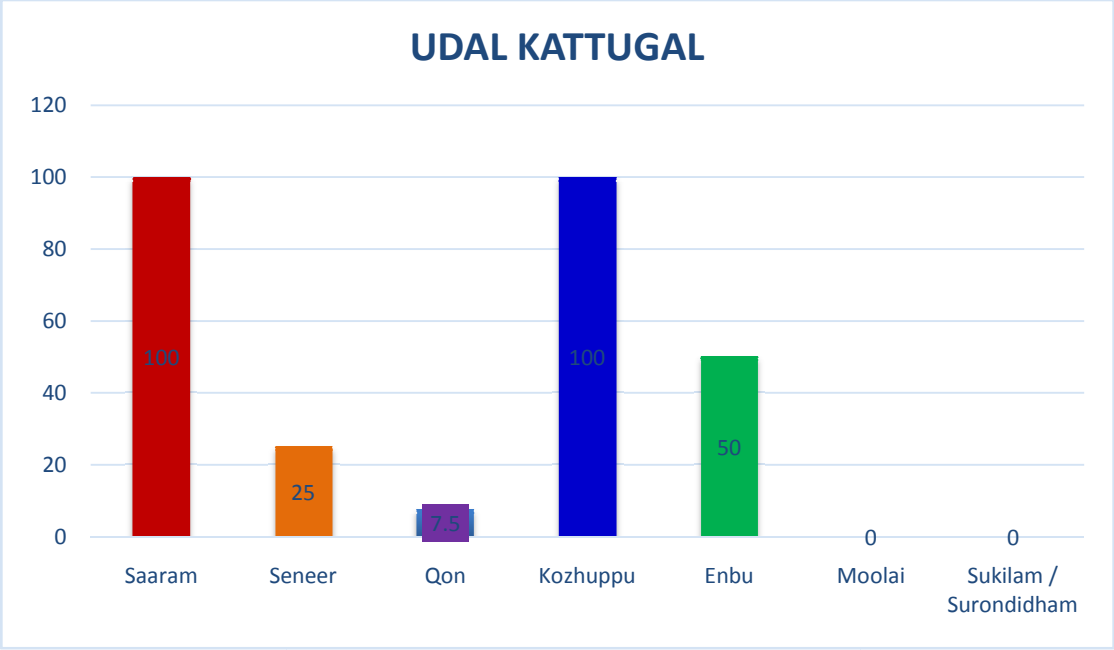
Inference:

Among all Santhigam and Avalambagam was affected in all 40 cases (100%)

18.DISTURBANCE IN UDAL KATTUGAL:

Table : 18

S.No.	UdalKattugal	No. of cases	Percentage (%)
1	Saaram	40	100
2	Seneer	10	25
3	Qon	3	7.5
4	Kozhuppu	40	100
5	Enbu	20	50
6	Moolai	0	0
7	Sukilam / Surondidham	0	0



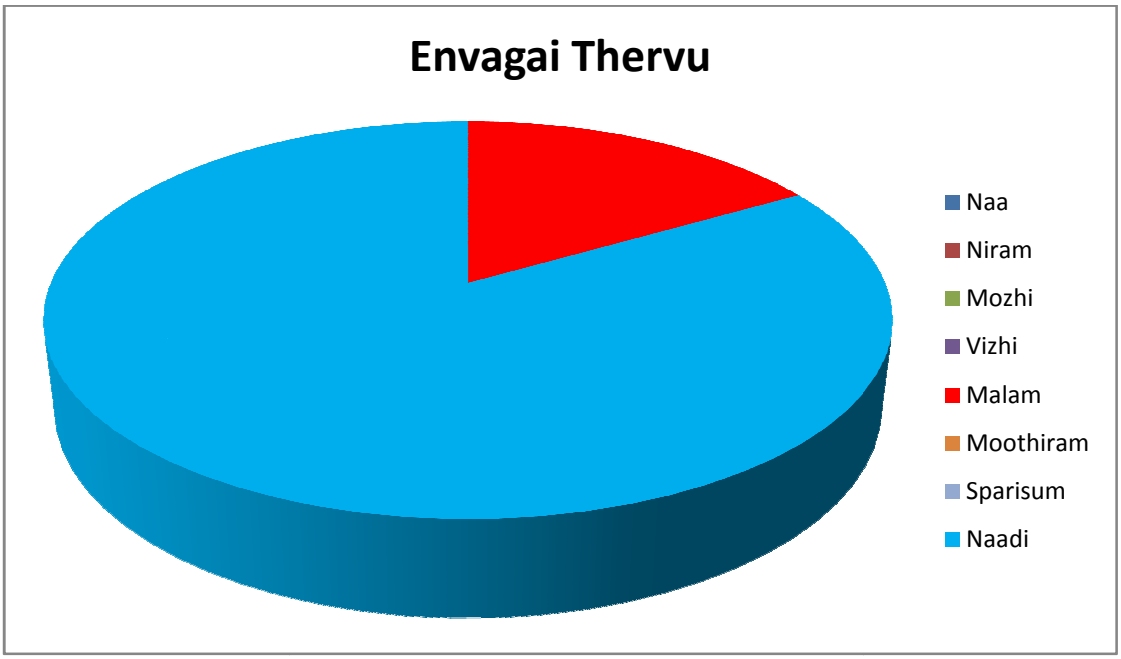
Inference:

It was diagnosed, during the study that among the seven udalkattukal, Saaram, oon, Kozhuppu, Enbu,moolaiwere affected in 40 cases (100%)

19.DISTURBANCE IN ENVAGAI THERVUGAL:

Table:19

S.No.	Envagai Thervugal	No. of Cases	Percentage (%)
1	Naa	0	0
2	Niram	0	0
3	Mozhi	0	0
4	Vizhi	0	0
5	Malam	8	20
6	Moothiram	0	0
7	Sparisum	0	0
8	Naadi	40	100



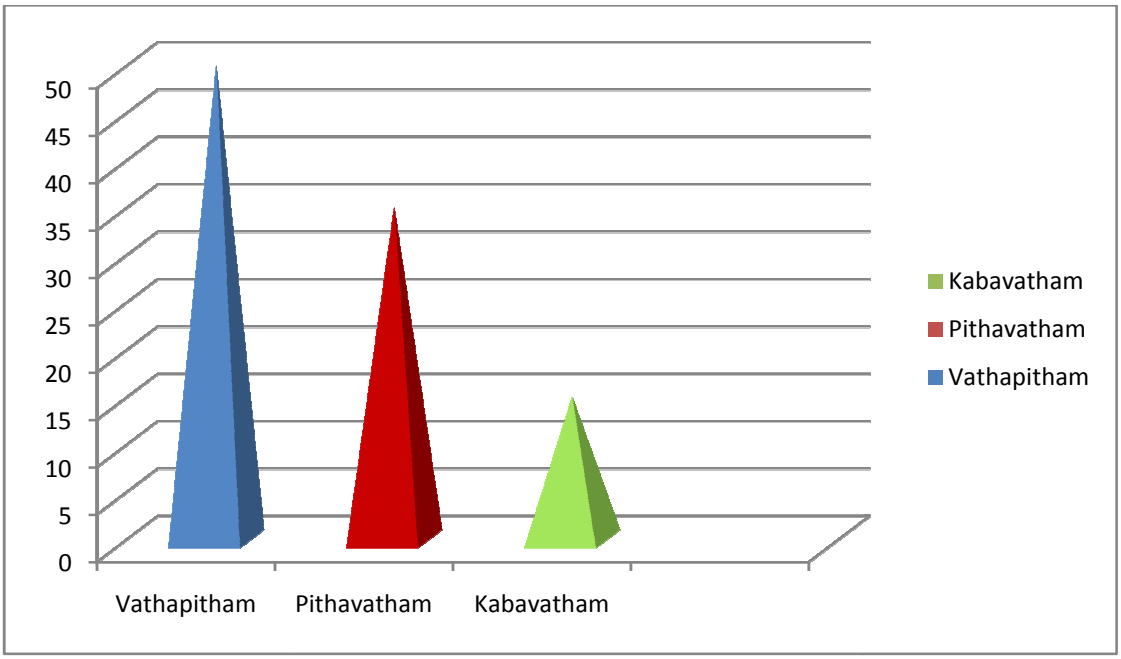
Inference:

It was learnt during the study that Naadi was noted in all 40 cases (100%) Malam was affected in 8 cases (20%)

20.PULSE READING (NAADI)

Table : 20

S.No.	Parameters	No. of Cases	Percentage (%)
1	Vathapitham	20	50
2	Pithavatham	14	35
3	Kabavatham	6	15



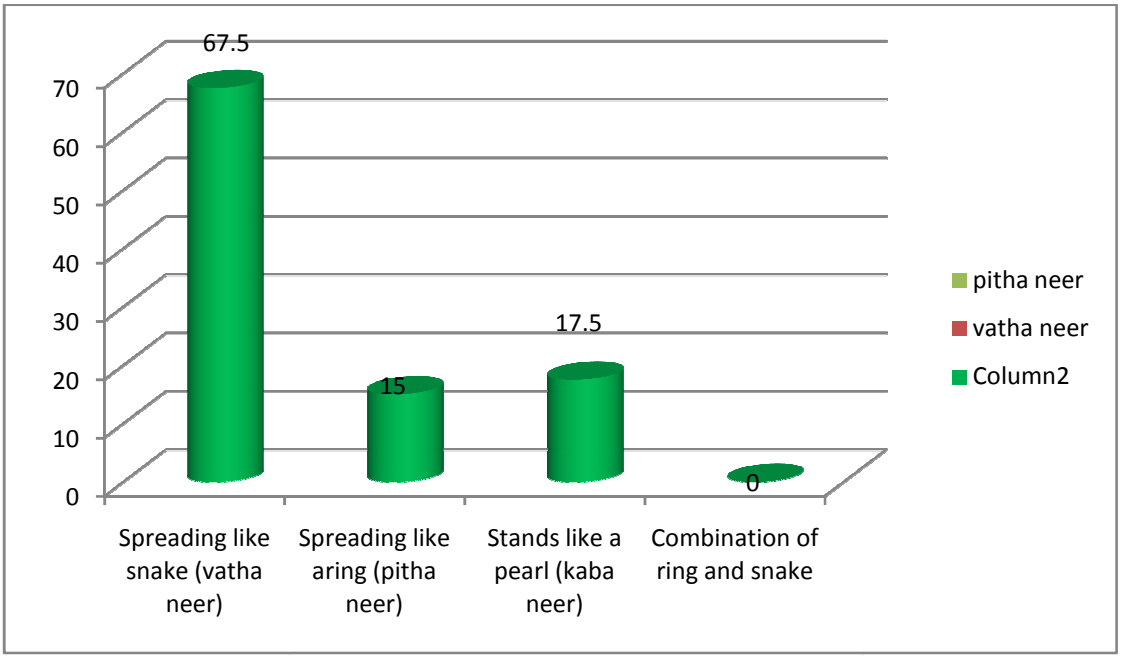
Inference:

As mentioned above naadi was noted in all cases and among that 20 cases (50%) were vathapitham, 14 cases(35%) were pithavatham, and remaining 6 cases (15%) were kabavathanaadi.

21. NEIKURI

Table : 21

S.No.	Inference	No. of Cases	Percentage (%)
1	Spreading like snake (vathaneer)	27	67.5
2	Spreading like aring (pithaneer)	6	15
3	Stands like a pearl (kabaneer)	7	17.5
4	Combination of ring and snake	0	0



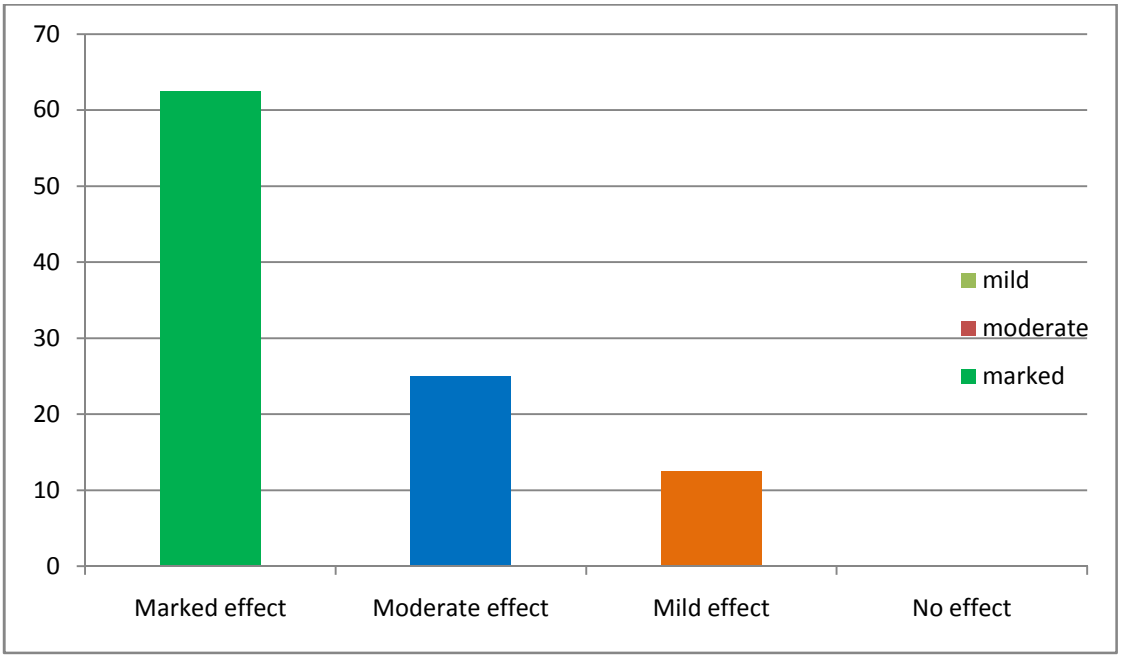
Inference:

In Neikuri analysis, 67.5% of the cases presented with Vathaneer, 15% with pithaneer 17.5% with kabaneer.

22:ASSESSMENT OF RESULT BY THE EFFECT OF COMBINED THERAPY

Table : 22

S.No.	Effect of therapy	No of patients	Percentage (%)
1	Marked effect	25	62.5
2	Moderate effect	10	25
3	Mild effect	5	12.5
4	No effect	0	0



Inference:

Thus from the analysis of the data collected during the course of treatment and at the end of treatment it is inferred that the overall effect of the therapy. Internal, external and complementary. Marked effect of 62.5% moderate effect of 25% and mild effect of 12.5%.

Table: 23.(a) List of Out Patients of PG-III Sirappu Maruthuvam Department Given

1. Keel vayu nivarana chooranum- Internal 2. Vathathirku thylam - External

S.NO	OP.NO	NAME	AGE/SEX	Date of Registration on	Date of Discharge	Total No.of days treated	Symptoms				RESULTS
							P	S	MS	MR	
1	56809	Sivagami	40/F	07/07/2018	20/08/2018	45	+	+	+	+	Good
2	62837	larence	44/M	28/7/2018	06/11/2018	40	+	+	+	+	Moderate
3	63450	Nurjagan	40/F	31/7/2018	08/09/2018	40	+	+	+	+	Moderate
4	65529	Lakshmi	50/F	06/08/2018	28/09/2018	55	+	+	+	+	Fair
5	69339	Muthulakshmi	50/F	21/08/2018	06/10/2018	47	+	+	+	+	Good
6	78021	Murugan	30/M	20/09/2018	31/10/10	42		+	+	+	Good
7	107638	Alagammal	53/F	28/12/2018	01/02/2019	36	+	+	+	+	Good
8	8647	Jayalakshmi	55/F	23/01/2019	05/03/2019	42	+	+	+	+	Moderate
9	9146	Rathinum	55/F	24/01/2019	20/03/2019	56	+	+	+	+	Mild
10	13816	Sanmugamuthu	45/F	07/02/2019	14/03/2019	36	+	+	+	+	Moderate
11	16298	Isaaik	35/M	13/02/2019	23/03/2019	40	+	+	+	+	Good
12	16664	Saresvathi	60/F	14/12/2019	30/03/2019	45	+	+	+	+	Moderate
13	17966	Muthulakshmi	45/F	16/02/2019	30/03/2019	43	+	+	+	+	Moderate
14	18236	Prama	47/F	19/02/2019	03/04/2019	44	+	+	+	+	Good
15	20131	Kamala	52/F	25/02/2019	05/04/2019	40	+	+	+	+	Good
16	22128	Jancie	38/F	02/03/2019	10/04/2017	40	+	+	+	+	Mild
17	27501	Vadivu	52/F	19/03/19	05/05/2019	48	+	+	+	+	Moderate
18	27602	Mariappa	58/M	19/03/2019	31/04/2019	43	+	+	+	+	Good
19	30036	Rajammal	34/F	27/03/2019	14/05/2019	48	+	+	+	+	Moderate
20	31799	Chellammal	45/F	02/04/2019	08/05/2019	37	+	+	+	+	Moderte

P- Pain, S – Swelling, MS – Morning stiffness, MR – Movement Restricted

Table 25 (b) Investigation for OP Patients

S.No	OP.No	Haemotological Investigation																					Urine Analysis					
		WBC Total		WBC Differential Count (%)						E.S.R. mm/hr				HB (gms%)		BT mgs%			AT mgs%			RA FACTOR		BT			AT		
				BT			AT			BT		AT																	
		BT	AT	P	L	E	P	L	E	1/2 hr	1 hr	1/2 hr	1 hr	BT	AT	BS	BU	BC	BS	BU	BC	BT	AT	Alb	Sug	Dep	Alb	Sug	Dep
1	56809	6000	6200	64	34	2	66	32	2	15	30	15	28	11	12	80	31	102	90	23	106	+	+	Nil	Nil	NAD	Nil	Nil	NAD
2	62837	8200	8600	72	24	4	72	26	2	27	45	20	42	10.5	11	90	19	162	90	19	158	+	+	Nil	Nil	1-2 PC	Nil	Nil	NAD
3	63450	9500	9400	62	34	4	63	34	3	26	40	25	38	9.8	10.5	80	28	199	80	22	195	+	+	Nil	Nil	NAD	Nil	Nil	NAD
4	65529	8000	8100	61	33	6	61	34	5	13	44	12	42	9	10.5	109	20	141	105	17	150	+	+	Nil	Nil	NAD	Nil	Nil	NAD
5	69339	10000	9900	65	34	1	67	33	-	18	40	22	58	9.9	10.5	90	25	126	90	19	120	+	+	Nil	Nil	NAD	Nil	Nil	NAD
6	78021	8100	8300	73	20	7	74	22	4	80	120	65	90	9.9	11	88	17	198	92	16	194	+	+	Nil	Nil	NAD	Nil	Nil	NAD
7	107638	11000	11000	50	36	4	60	37	3	20	44	16	38	11.2	11.4	100	12	121	96	15	121	+	+	Nil	Nil	NAD	Nil	Nil	NAD
8	8647	8800	8400	66	29	5	65	30	5	25	41	24	35	10.4	11.5	108	28	132	108	27	133	+	+	Nil	Nil	NAD	Nil	Nil	NAD
9	9146	8700	8700	76	23	1	76	23	1	28	45	18	40	8.9	10.6	90	13	137	92	14	135	+	+	TRACE	Nil	1-2 PC	Nil	Nil	NAD
10	13816	7000	7200	68	30	2	67	30	3	45	76	42	72	9.3	10.4	106	21	144	102	19	145	+	+	Nil	Nil	1-2 PC	Nil	Nil	NAD
11	16298	7500	7800	70	30	-	66	33	1	10	20	6	14	11.5	11.5	112	19	168	110	17	162	+	+	Nil	Nil	NAD	Nil	Nil	NAD
12	16664	9500	9600	62	36	2	63	34	3	8	10	10	20	12	12.5	80	26	164	82	24	156	+	+	Nil	Nil	NAD	Nil	Nil	NAD
13	17966	7000	7100	69	28	3	72	27	1	20	38	18	38	11	11.4	82	18	130	90	20	128	+	+	Nil	Nil	NAD	Nil	Nil	NAD
14	18236	9000	9200	65	30	5	64	31	5	30	54	28	48	11.5	12	109	16	150	107	17	157	+	+	Nil	Nil	NAD	Nil	Nil	NAD
15	20131	7800	8000	70	26	4	72	25	3	20	60	18	55	9.9	11	96	26	152	88	18	145	+	+	TRACE	Nil	NAD	Nil	Nil	NAD
16	22128	8600	8400	73	25	2	70	24	6	33	40	31	38	11	11.5	110	20	160	109	22	140	+	+	Nil	Nil	NAD	Nil	Nil	NAD
17	27501	7000	7200	65	32	3	68	28	4	22	41	20	40	12	13	86	28	152	90	25	138	+	+	Nil	Nil	NAD	Nil	Nil	NAD
18	27602	8100	8200	70	26	4	68	26	6	30	60	26	59	12.5	13	94	24	152	100	22	150	+	+	Nil	Nil	NAD	Nil	Nil	NAD
19	30036	9100	9000	63	35	2	70	30	-	17	40	13	35	11.8	12.2	101	21	160	105	22	160	+	+	Nil	Nil	1-2 PC	Nil	Nil	NAD
20	31799	8900	8800	63	30	7	62	36	2	18	42	16	36	10.8	11.5	100	14	187	95	20	160	+	+	Nil	Nil	1-2 PC	Nil	Nil	NAD

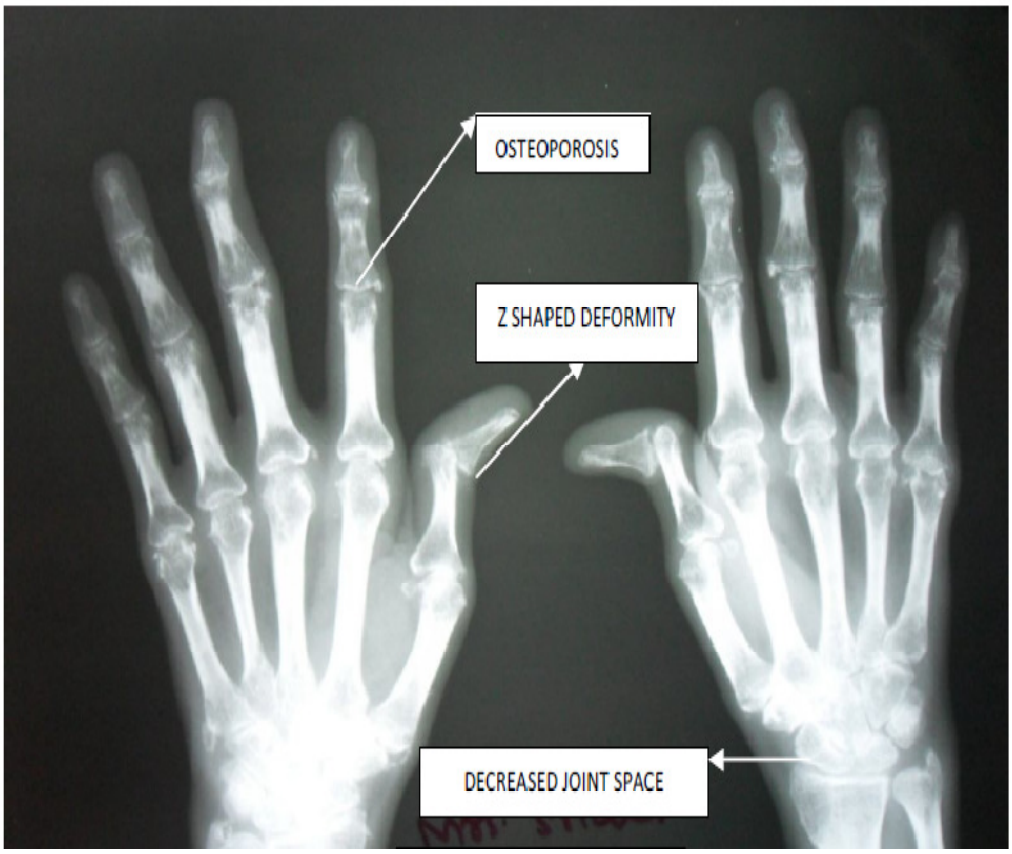
Table: 26 (a) List of IN Patients of PG-III Sirappu Maruthuvam Department Given

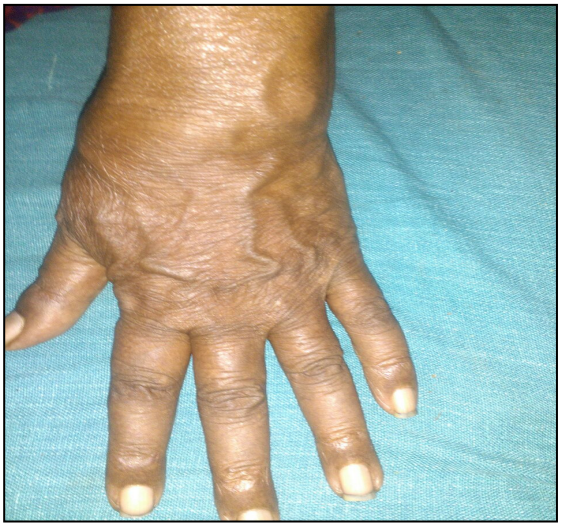
1. Keel vayu nivarana chooranum- Internal 2. Vathathirku thylam - External

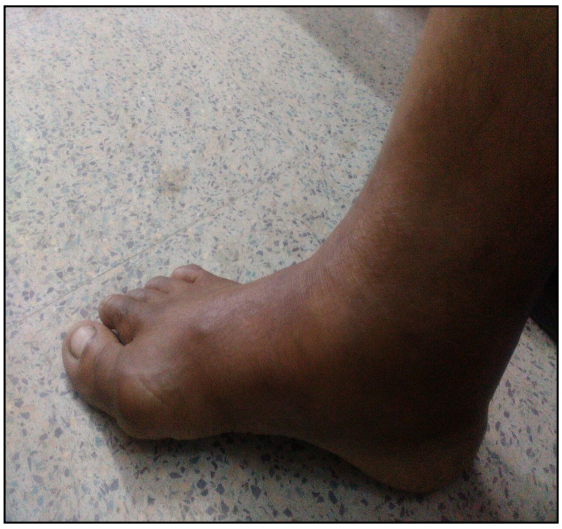
S.NO	IP.NO	NAME	AGE/SEX	D.O.A	D.O.D	NO.OF. DAYS	SYMPTOMS				RESULT
							P	S	MS	MR	
1	1720	Mariammal	48/F	06/07/2018	21/08/2018	47	+	+	+	+	G00D
2	1759	Bearmugamath	52/M	10/07/2018	17/08/2018	39	+	+	+	+	MODERATE
3	1897	Lakshmi	60/F	25/07/2018	21/09/2018	40	+	+	+	+	MODERATE
4	1981	Pappa	55/F	03/08/2018	21/09/2018	32	+	+	+	+	GOOD
5	2044	Kiruba	53/F	09/08/2018	03/09/2018	26	+	+	+	+	GOOD
6	2189	Sankaravadivu	37/F	27/08/2018	09/10/2018	44	+	+	+	+	MILD
7	2239	Abrin	40/F	31/08/2018	05/10/2018	36	+	+	+	+	GOOD
8	2913	Esakkiammal	31/F	28/11/2018	29/12/2018	32	+	+	+	+	GOOD
9	2968	Gomathi	55/F	05/12/2018	04/01/2019	32	+	+	+	+	MODERATE
10	13	Kannammal	50/F	03/01/2019	18/02/2019	48	+	+	+	+	FAIR
11	151	Velammal	57/F	24/01/2019	21/02/2019`	29	+	+	+	+	MILD
12	507	Pacheammal	33/F	27/01/2019	13/03/2019	46	+	+	+	+	MODERATE
13	249	Krishanaammal	46/F	05/02/2019	13/03/2019	37	+	+	+	+	MODERATE
14	261	Krish	60/F	06/02/2019	25/03/2019	49	+	+	+	+	MODERATE
15	275	Kalaiselvi	47/F	07/02/2019	20/03/2019	42	+	+	+	+	GOOD
16	359	Saresvathi	60/F	13/02/2019	29/03/2019	46	+	+	+	+	GOOD
17	367	Ramalakshmi	43/F	14/02/2019	29/03/2019	45	+	+	+	+	MILD
18	466	Aarumugam	60/F	23/02/2019	27/03/2019	36	+	+	+	+	MILD
19	490	Pakiyavathi	41/F	26/02/2019	23/03/2019	26	+	+	+	+	GOOD
20	513	Guruswamy	59/M	28/02/2019	09/04/2019	40	+	+	+	+	GOOD

Table 26 (b) Investigation for IP Patients

S.No	IP.No	Haemotological Investigation																					Urine Analysis					
		WBC Total		WBC Differential Count (%)						E.S.R. mm/hr				HB (gms%)		BT mgs%			AT mgs%			RA FACTOR		BT			AT		
				BT			AT			BT		AT																	
		BT	AT	P	L	E	P	L	E	1/2 hr	1 hr	1/2 hr	1 hr	BT	AT	BS	BU	BC	BS	BU	BC	BT	AT	Alb	Sug	Dep	Alb	Sug	Dep
1	1720	6200	6200	64	32	4	66	32	2	15	30	15	28	11	12	80	31	108	90	24	106	+	+	TRACE	Nil	NIL	Nil	Nil	NAD
2	1759	8200	8600	72	24	4	72	26	2	27	45	20	42	10.5	11	90	19	13	100	20	158	+	+	Nil	Nil	NIL	Nil	Nil	NAD
3	1897	9500	9000	66	34	0	63	37	0	26	40	25	38	9.8	10.5	80	28	199	80	22	195	+	+	Nil	Nil	1-2 PC	Nil	Nil	NAD
4	1981	8000	8100	61	33	6	61	35	4	13	44	12	42	9	10.5	109	20	141	105	17	150	+	+	Nil	Nil	NIL	Nil	Nil	NAD
5	2044	10000	9900	65	34	1	67	33	-	18	40	22	58	9.9	10.5	90	25	126	90	19	120	+	+	TRACE	Nil	1-2 PC	Nil	Nil	NAD
6	2189	8100	8200	73	20	7	74	22	4	80	120	65	90	9.9	11	88	17	198	92	16	194	+	+	Nil	Nil	NIL	Nil	Nil	NAD
7	2239	11000	11000	50	36	4	60	37	3	20	44	14	36	11.2	11.4	100	12	121	98	15	121	+	+	Nil	Nil	NIL	Nil	Nil	NAD
8	2913	8800	8400	66	29	5	65	30	5	25	41	24	35	10.4	11.5	108	28	140	118	27	133	+	+	Nil	Nil	NIL	Nil	Nil	NAD
9	2968	8700	9000	75	24	1	77	24	1	28	40	18	38	8.9	10.6	90	13	137	92	14	135	+	+	Nil	Nil	1-2 PC	Nil	Nil	NAD
10	13	7000	7200	68	30	2	67	30	3	45	76	42	72	9.3	10.4	106	21	144	102	19	145	+	+	Nil	Nil	NIL	Nil	Nil	NAD
11	151	7500	7800	70	30	-	66	33	1	10	20	6	14	11.5	11.5	112	19	168	110	17	162	+	+	TRACE	Nil	1-2 PC	Nil	Nil	NAD
12	507	9500	9600	62	36	2	63	34	3	8	10	10	20	12	12.5	80	26	164	82	24	156	+	+	Nil	Nil	1-2 PC	Nil	Nil	NAD
13	249	7000	7100	69	28	3	72	27	1	20	38	18	38	11	11.4	82	18	130	90	20	128	+	+	Nil	Nil	1-2 PC	Nil	Nil	NAD
14	261	9000	9200	65	30	5	64	31	5	30	54	28	48	11.5	12	109	16	150	107	17	157	+	+	Nil	Nil	1-2 PC	Nil	Nil	NAD
15	275	7800	8000	70	26	4	72	25	3	20	60	18	55	9.9	11	96	26	152	88	18	145	+	+	TRACE	Nil	1-2 PC	Nil	Nil	NAD
16	359	8600	8400	73	25	2	70	24	6	33	40	31	38	11	11.5	110	20	160	109	22	140	+	+	Nil	Nil	1-2 PC	Nil	Nil	NAD
17	367	7000	7200	65	32	3	68	28	4	22	41	20	40	12	13	86	28	152	90	25	138	+	+	Nil	Nil	1-2 PC	Nil	Nil	NAD
18	466	8100	8200	70	26	4	68	26	6	30	60	26	59	12.5	13	94	24	152	100	22	150	+	+	Nil	Nil	1-2 PC	Nil	Nil	NAD
19	490	9100	9200	64	34	2	70	30	-	15	38	13	35	11.8	12.2	101	21	160	105	22	146	+	+	Nil	Nil	1-2 PC	Nil	Nil	NAD
20	513	8900	8800	63	30	7	62	36	2	18	42	16	34	10	11	101	16	188	96	26	168	+	+	Nil	Nil	1-2 PC	Nil	Nil	NAD


OSTEOPOROSIS
Z SHAPED DEFORMITY
DECREASED JOINT SPACE





6. DISCUSSION

The main aim of the treatment was to study the Therapeutic effect of the drug KEEL VAYU NIVARANA CHOORANAM (internal),VATHATHIRKU THYLAM (External) and VEDHU (external therapy) as compained therapy to reduce pain, swelling and restricted joint movements in the disease Uthira Vatha Suronitham. The clinical features of Uthiravatha Suronitham can be correlated to Rheumatoid Arthritis in modern science. Rheumatoid Arthritis is a chronic inflammatory, destructive, and deforming symmetrical poly arthritis associated with symmetrical involvement of joints.

Uthiravatha Suronitham is a Vatha disease in which, there occur a derangement of Vatha thathu and Pitha thathu.

Gender Distribution

From the above tabulation. Among the 40 patients selected,85% were female, and 15% were female.

Age distribution

Among the 40 patients selected this study shows high incidence of UTHIRA VAATHA SURONITHAM (RHEUMATOIDARTHRITIS) was in above 51-60years (42.5%) of age .

Kaalam Distribution

From the above mentioned tabulation, Among the 40 patients selected in this study, its shows the higher incidence was initiated to be pitha kaalam (92.5%).

Occupational Status

In this study, the rate of incidence is higher in occupational group which includes farmers and labours (15%) House wifes (29.5%) Teachers (7.5%) and Tailors (5%). This study shows heavy work farmets and Labours are mostly affected.

Seasonal variations

From the above mentioned tabulation 20% of patients were admitted in Muthuvenil kaalam, 37.5% of patients were admitted in munpanikaalam, 7.5% of patients were admitted in karkalam, 7.5% of patients were admitted in koothirkulam. Mostly the patients were admitted in Munpani kaalam.

Thinai

From the above mentioned tabulation 80% were from maratham, 20% were from Neithal.

Even though siddha literatures mention maratham as a disease free zone,most of the patients came from maratham nilam. This may be due to the altered lifestyle, environment and food habits. Since this is a single centered study, located in maratham thinai it may also have influenced the study.

Socio-economic status

From the above mentioned tabulation, out of 40 patients, 57.5% were from poor socio-economic status. 37.5% of cases from rich background. The higher incidence in the low socio-economic status may be due to the over usage by farmer, and manual worker among the poor. The incidence in the further population group may be due to improper nutrition and also the people living in poor sanitation.

Dietary habits

From the above mentioned tabulation patients 87.5% were reported to have Non-vegetarian, 12.5 % were reported vegetarian, so this has no statistically significant result.

Mode of onset

From the above mentioned tabulation it shows that 75% of the cases were reported to have graduate onset.

Duration of condition

Among the 40 cases, 14 cases (35%) were come under 0-3 months, 16 cases (40%) were come under 4-6 months, 3 cases (7.5%) were come under 7-12 months, 7 cases (17.55%) were come under 13-24 months.

Clinical symptoms Inference

Pain, swelling of joints, morning stiffness, tenderness, restricted movement and warmth were found in all the 40 patients before treatment.

After treatment there was a considerable reduction in all symptoms particularly in pain, morning stiffness, swelling of joints, tenderness, restricted movements and warmth.

After treatment there was a complete relief in the symptoms like low grade fever, sleeplessness and loss of appetite.

Deformity

Among the 40 patients,22.5% cases hand spindle shaped fingers, 12.5% cases had ulnar deviation of hand,2.5% cases had hallus valgus , 10% cases had swan neck deformity,and 2.5 cases had z shaped deformity.

Involvement of joints

Among the 40 cases 95% had knee joints, 95% of the cases had proximal interphalangeal joint,87.5% had ankle joints, and 82.5% metacarpophalangeal joints, 62.5% had wrist joints, 45% had cervical spine, 40% had elbows, 25% had hip joints, 17.5 %had shoulder joints and 50% had meta tarsophalangeal joints

Distribution in Kanmenthiram

From the above mentioned tabulation, among the patients Vaai, Kruvai, Karuvai, Kai and Kaal have been affected in 100% of cases and in 8 patients eruvai have been affected (20%).

Distribution of Three Dhosham

Derangement in Vatham

Viyanan and Samanan were affected in all the 40 cases (100%), Udhanan were affected in 21 cases(52.5%), pranan were affected in 20 cases (50%) Abanan were affected in 8 cases (20%) Kirukaran and Devathathan affected in 9 cases (22.5%)

Derangement of Pitham

Sathaga pitham was affected in all 40 cases (100%) Ranjagapitham was affected in 12 cases (30%), Anarpitham was affected in 10 cases (25%).

Derangement in Kabam

Avalambagam, Santhigam was affected in all 40 cases 100%.

Udal Kattukal

It was diagnosed, during the study that among the seven udalkattukal, Saaram, oon, Kozhuppu, Enbu ,moolai were affected in 40 cases (100%) .

Envagai Theruvugal

The analysis showed the efficacy of this method and the Prime importance of Naadi.

Among the 40 cases Naadi have been affected in all cases while malam have affected in 8 cases (20%).

Naadi

As mentioned above naadi was noted in all cases and among that 20 cases (50%) were vathapitham, 14 cases (35%) were pithavatham, and remaining 6 cases (15%) were kabavatha naadi.

Neikuri

In Neikuri analysis, 67.5% of the cases presented with Vatha Neer, 17.5% with Pithaneerx.

Laboratory investigations were done in all the cases before and after treatment. The significant variations occur in parameters like Hb, while other parameters have insignificant variation.

Treatment

The treatment was aimed to retain the deranged dhosham and providing relief from symptoms. Before treatment the patient were advised to take vellai ennai - 15ml with hot water during early morning in empty stomach for first day of treatment. The patients was asked to take rest from internal Medicine and other activities on that day. From the next day onward the internal medicine to be given.

The author treated the patients with trial drugs KEEL VAYU NIVARANA CHOORANAM (Internal Medicine) 10-20gm BD and VATHATHIRKU THYLAM (External Medicine) and VEDHU (External Therapy) During treatment, the patients were advised to follow pathiyam (avoid tarmarind, tubers, meat etc). But all aspects of pathiyam could not be imposed due to practical difficulties.

7. SUMMARY

Rheumatoid arthritis (RA) is a chronic systemic inflammatory disease of joints with unknown etiology. It usually affects the peripheral joints with a symmetrical distribution. Its systemic manifestations include hematologic, pulmonary, and neurological and cardio vascular abnormalities. Its clinical course is usually life-long, with intermittent relapsing and remissions with highly variable severity.

The major goal of Therapy is to reduce pain and progression of the disease along with maintenance of function of the joints while maintaining capability for work and recreational activities. Therapy also aims at improving the quality of life and the personal perception of the disease burden.

Here I have brought out a new trial with the drug "**KEELVAYU NIVARANA CHOORANAM**" (internal) & **VATHATHIRKU THYLAM"** (external) in reducing not only the pain but also the restricted movements, and also the effect of **VEDHU** (steam bath) over the disease.

40 cases with Uthira vaatha suronitham were diagnosed clinically and admitted in the inpatient ward and outpatient ward of post graduation department of Sirappu Maruthuvam, Government Siddha Medical College hospital, palayamkottai and treated by the trial medicines.

In this study, first the patients were well informed about the study and they were asked to sign the consent form. After signing the consent form, information sheet and diatery advice forms were given to the patients.

The various Siddha methods of examination of the disease were carried out and the data were recorded in the prescribed Proforma for the 40 selected cases.

Purgation was given by administering vellai ennai 15ml is given in early morning to bring the Thirithodam to equilibrium a day prior to treatment and the patient was given complete rest on the day of purgation.

The prognosis of the patients during each visit was entered and monitored for any adverse drug reactions or poor patient compliance, investigation reports were recorded before and after treatment.

Bio-chemical analysis revealed that the drug contains Calcium, Ferrous iron, tannic acid, reducing sugar and Unsaturated compounds.

- From the second day onwards internal medicine. KEEL VAYU NIVARANA CHOORANAM 10-20gm two times day after food and VATHATHIRKU THYLUM and VEDHU is given as external theraphy.
- At the time of treatment the patients were advised to follow pathiyam and specially advised to avoid foods which increase vadha.
- Daily improvement was observed to assess the efficacy. The results obtained were found to be propitious particularly results by combined therapies.
- No adverse reactions were found. Hence, the trial drug was found to be safe and effective.

8. CONCLUSION

The result of this clinical trial indicate that trial drug is clinically effective in Uthira vatha Suronitham. The toxicity study reveals that the trial drug Keel vayu nivarana chooranam is safe. It has analgesic and anti inflamatory activity.

The main aim of the treatment was to study the Therapeutic effect of the drug Keel vayu nivarana chooranam by its action on Pain, swelling, morning stiffness, restricted movements etc,.

In this study all the 40 cases were treated as compained therapy

Hence the study concludes that, the trial drugs are clinically effective in reducing the pain, swelling and morning stiffness, restricted movements in Uthiravatha suronitham patients. However further work with large number of patients should be carried out towards finding the ideal dose response.

The treatment was aimed at normalizing the deranged thodams and providing relief from symptoms.

There were no adverse reactions complained during the trial.

Because of the encouraging clinical outcome, the study may be further carried out with the same drug in a large number of cases.

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ANNEXURE –I

STANDARD OPERATING PROCEDURE FOR PREPARATION OF KEELVAYU NIVARANA CHOORANAM

SOURCE OF TRIAL MEDICINE:

The required drugs for preparation of KEELVAYU NIVARANA CHOORANAM (Int) and VATHATHIRKU THYLAM (Ext) and External Therapy Vedhu will be purchased from a well reputed country shop and the purchased raw drugs are authenticated by medical botanist, Govt Siddha Medical College, Palayamkottai, then purified and the medicine is prepared in the Gunapadam laboratory at Govt Siddha Medical College, Palayamkottai.

PROPERTIES OF THE TRIAL DRUG

INTERNAL MEDICINE:

KEELVAYU NIVARANA CHOORANAM

INGREDIENTS :

Sl. No.	INGREDIENT	BOTANICAL NAME	PART USED	MEASUREMENT
1.	Nannari ver pattai	Hemidesmus indicus	Bark	10thola(117gm)
2.	Parangipattai	Smilax china	Root	10thola(117gm)
3.	Seemai Amukkura	Withania somnifera	Root	10thola(117gm)
4.	Chitrarathai	Alpinia galanga	Root	5thola(58.5gm)

Purification of drugs:

- All the above raw drugs are purified as per the evidence mentioned in the Saraku suthi muraigal and Anuboga vaithiya bramma ragasiyam.

Preparation:

Purified dry drug is taken and powdered. Keep in airtight container

Dose : 10-20 grains(650mg- 1300mg), twice a day.

Adjuvent : Hot Water

Duration : 30 to 48 days

Indications : All types of Joint lesions.

பறங்கிப்பட்டை

Botanical Name	:	Smilax china
Synonyms	:	மதுஸ்மிகம், மதுஸ்மீகி, சீனப்பட்டை, பறங்கிச்சக்கை
Family	:	Liliaceae
Part used	:	Root
சுவை	:	இனிப்பு
வீரியம்	:	தட்பம்
பிரிவு	:	இனிப்பு

Therapeutic action

- உடற்றேற்றி,
- மேகப்பிணிவிலக்கி,
- காமம்பெருக்கி,
- தூய்மையாக்கி

குணம்

"தாகம் பலவாகதந் தாது நட்டம் புண் பிளவை
மேகங் கடிகிரந்தி வீழ்மூலந் தேகமுடன்
குட்டை பகந்த மேற் கொள்வமனம் போம் பறங்கிப்
பட்டையினை யுச்சரித்துப் பார்"

பொருள்

நீர் வேட்கை, முடவாதம், குறே நோய், நீரிழிவு, கடிவிடம், புண் இவை நீங்கும்

Chemical constituents

- 7-o-seta-D-gluco pyranoside,
- engeletin,
- isoengeletin,
- kaemiferol,
- rutin,
- vanillic acid
- Starch
- Gulucoside,
- Sapponine

அமுக்கிராக்கிழங்கு

Botanical Name	**:**	Withania somnifera
Family	**:**	Solanaceae
Tamil name	**:**	அமுக்கிரி, கிடிச்செவி, வராககர்ணி
English Name	**:**	Winter Cherry
Sanscrit Name	**:**	Aswagandha
Malayalam	**:**	Amukkara
Part used	**:**	Rhizome
சுவை	:	கைப்பு
வீரியம்	:	வெப்பம்
பிரிவு	:	கார்ப்பு

Therapeutic Actions :

- Sedative,
- Tonic,
- Deobstruent
- Diuretic
- Aphrodisiac
- Soporific

Chemical constituents :

- Isopelletierine,
- anaferine,
- saponins,
- sitoindosides
- Somniferine,
- Withanine,
- Perinponyine,

பொதுகுணம் :

"கொஞ்ந் துவர்ப்பாங் கொடியகயம் சூலையரி
மிஞ்சுகரப் பான்பாண்டு வெட்பதட்பு - விஞ்சி
முகவுறு தோடமும்போ மோகம் அனலுண்டாம்
அசுவகந் திக்கென் றறி"

- அகத்தியர் குணவாகடம்

சிற்றரத்தை

Botanical Name	**:**	Alpinia Officinarum
Family	**:**	Zingiberaceae
Tamil name	**:**	Chittaratai
English Name	**:**	Lesser Galangal
Sanscrit Name	**:**	Rasna
Malaiyalam	**:**	Aratha
Part used	**:**	Rhizome
சுவை	:	கார்ப்பு
வீரியம்	:	வெப்பம்
பிரிவு	:	கார்ப்பு

Therapeutic Action :

- Expectorant
- Febrifuge
- Stomachic
- Carminative

Chemical constituent :

- Galangol
- Galangin
- Volatile oil
- Diaryheptanoid
- Sterol
- Flavinoids

பொதுகுணம்:

வாதபித் தங்கருப்பான் வாதஞ் சிரோரோகஞ்
சேர்ந்தகப முத்தோடஞ் சீதமொடு – நேர்ந்த சுரம்
மற்றரத்தைக் காட்டி வருமிரும லுந்தீரும்
சிற்றரத்தை வன்மருந்தால் தேர்.

- தேரன் குணவாகடம்

வளி, ஐயக்குற்றங்கள், கரப்பான், வாயு, தலைநோய், சீதளம், இருமல், பல சுரம் ஆகியவை போம்.

நன்னாரி

Botanical Name	**:**	Hemidesmus Indicus
Family Name	**:**	Asclepiadaceae
Tamil Name	**:**	Ankaaramooli, Narunetti, Neerundi, Paathalamuli,
Ayurvedic Name	**:**	Sveta Sariva, Anantmool
Unani Name	**:**	Ushba
Hindi Name	**:**	Anantamul
Part Used	**:**	Root
சுவை	:	இனிப்பு, சிறுகைப்பு
வீரியம்	:	தட்பம்
பிரிவு	:	இனிப்பு

Therapeutic Action

- Demulcent,
- Alterative,
- Astringent,
- Diaphoretic,
- Diuretic,
- Tonic,
- Anti-pyretic,
- Blood purifier.

Chemical consitutent :

Root contain :

- Hexatriacontane,
- Lupeol, Its Octacosanoate,
- α-Amyrin, β-Amyrin, Its Acetate And Sitosterol.
- Coumarino-Lignoid-Hemidesminine,
- Hemidesmin I and Hemidesmin Ii50,
- Six Pentacyclic
- Triterpenes Including two Oleanenes, and three Ursenes

The Stem Contains

- Calogenin Acetylcalogenin-3-0-β-D-Digitoxopyrannosyl-0-β-D-Digitoxopyronsyl-0-β-D-Digitoxopyranoside.

- 3-Keto-Lup-12-En-21 28-Olide along with Lupanone,
- Lupeol-3-β-Acetate,
- Hexadecanoic Acid
- , 4-Methoxy-3-Methoxybenzalaldehyde and 3-Methoxy-4-5methoxybenzalaldehydglycosides-Indicine and Hemidine.

The leaves contain

- Tannins,
- Flavonoids,
- Hyperoside,
- Rutin and Coumarino
- .Leucoderma Lignoids such as Hemidesminine,
- Hemidesmin I and Hemidesmin Ii are rare Group of naturally occurring compounds presentiIn Leaves.

Therapeutic Uses

- The root of the *Hemidesmus* plant is demulcent, alterative, astringent, diaphoretic, diuretic, tonic, anti-pyretic, and blood purifier.
- It is used in leprosy, skin diseases, fever, asthma, bronchitis, syphilis, pruritus and other urinary diseases, chronic rheumatism, and leucorrhoea.

பொதுகுணம்

“சலதோடம் பித்தமதி தாகம் உழலை
சலமேறு சீதமின்னார் தஞ்சூ-டுலகமதிற்
சொன்னமது மேகம் புண் சுரமிவையெ லாமொழிக்கும்
மென்மதுர நன்னாரி வேர்

- தேரன் குணவாகடம்

EXTERNAL MEDICINE:

VATHATHIRKU THYLAM

INGREDIENTS	BOTANICAL NAME	PART USED	MEASUREMENT
1.Manipungu	Sapindus laurifolia	Outer layer	35gm
2.Erukku verpattai	Calotropis gigantea	Root bark	35gm
3.Murukkilai charu	Erythrina variegata	Leaf	250ml
4.Velai charu	Cleome viscosa	Leaf	250ml
5.Goat's milk			1/3 amount of above extract (83 Ml)
6.Castor oil	Ricinus communis		½ amount of above extract (125 Ml)

Method of preparation:

Grind the ingredients 1 and 2,make it into kudineer and then add the remaining ingredients with it and boil until required consistency formed. Filter it then kept in a dry airtight container.

Vedhu (Thazhuthazhai) is manipulated in patients depending upon the severity of illness

Ref: Aruvaimaruthvam (page.no:40-41)

Erukku

Tamil Name	**:**	Erukku
வேறுபெயர்	**:**	அருக்கன்
English Name	:	Madar
Botanical Name	:	Calatropis Gigantea
Family	:	Asclepiadaceae
Part Used	:	Root
சுவை	:	கைப்பு காரம் இனிப்பு
தன்மை	:	வெப்பம்
பிரிவு	:	கார்ப்பு

Constituents:

- Beta amyrin,
- alpha isomeric crystalline alcohols,
- giganteol,
- iso iganteol.

Action

- Alterative
- Tonic
- Antispasmodi

பொதுகுணம் :

மன்னனையுங் கையெடுக்க வைத்தெயிற்றி னேயகற்றி
யுன்னு பிணிப்பணியை யோட்டுதலாற் -சொன்னேன்
எருக்கெனவே பூமி யினிலே விளங்கும்
அருக்க மருக்கனென லாம்

(தே.வெண்பா)

நல்வேளை

English Name	:	Dog mustard
Parts used	:	இலை, பூ, விதை, வேர்
சுவை	:	கார்ப்பு,
தன்மை	:	வெப்பம்,
பிரிவு	:	கார்ப்பு

Action

புழுக்கொல்லி	-	Anthelmintic
இசிவகற்றி	-	Antispasmodic
அகட்டுவாய்வகற்றி	-	Carminative
வியர்வைபெருக்கி	-	Diaphoretic
தடிப்புண்டாக்கி	-	Rubefacient

Chemical Constituents:

- Essential oil
- Tarpenes
- Flavonoids
- Anthocyanins
- Alkaloids

பொதுகுணம் :

"சிரநோய் வலிகுடைச்சல் தீராச் சயித்தியம்
உரநோ யிவைக ளொழியும் - உரமேவும்
வில்வேளைக் காயும் விழியாய் பசிகொடுக்கும்
நல்வேளை தன்னை நவில்."

Manipungu

Botanical Name	**:**	Sapindus Laurifolia
Family Name	**:**	Sapindacea
Tamil Name	**:**	Ponnankaai,Punkumaram, Poovunthi
English Name	**:**	Soap Nut,
Sanscrit Name	**:**	Arishta, Aristaphalam
Hindi Name	**:**	Ritha
Part used	**:**	இலை, காய்
சுவை	**:**	கைப்பு, துவர்ப்பு
தன்மை	**:**	வெப்பம்
பிரிவு	**:**	கார்ப்பு

Therapeutic action :

- Expextorent
- Nauseact
- Anthelmintic

Chemical constituents :

- Saponins
- Giygeride
- Flavonoids
- Quercetin
- Apigenin
- Rutin
- Triterpene
- Triglycerids

Murukkilai

Botanical Name	**:**	Erythrina variegate
Family Name	**:**	Fabaceae
Tamil Name	**:**	முள் முருக்கு, கிஞ்சுகம்
English Name	**:**	Indian Coral Tree,
Sanscrit Name	**:**	Parijataka, Kimsukam, Mandaya
Hindi Name	**:**	Ferrad ,Mandar
Part used	**:**	இலை, பூ, விதை, பட்டை
சுவை	:	கைப்பு, கார்ப்பு
தன்மை	:	வெப்பம்
பிரிவு	:	கார்ப்பு

Therapeutic action :

- Expextorent
- Anthelmintic
- Febrifuge
- Anti –bilious

Chemical constituents:

- Alkaloids
- Flavoniods
- Pterocarpans
- Triterpenes
- Steroids
- Alkyl transferulates
- Lecithin
- proteins

பொதுகுணம்

முள்ளு முருக்கதுதான் மோதுகின்ற சர்த்திகுன்மமங்
கள்ளமறத் தீர்க்குங் கனற்சுரமும் விள்ளரிய
அக்கரமும் போக்கு மனல்வாய்வேக் காடகற்றும்
மிக்கவ வலிகொடுக்கும் விள்.

ஆமணக்கு எண்ணெய் (விளக்கெண்ணெய்)

Botanical Name	**:**	Ricinus Communis
Family	**:**	Euphorbiaceae.
வேறு பெயர்	:	ஏரண்டம், சித்திரம், தலரூபம்
Part Used	**:**	Seed
சுவை	:	கசப்பு
வீரியம்	:	வெப்பம்
பிரிவு	:	கார்ப்பு

Therapeutic Actions :

- ❖ Laxative,
- ❖ Emollient

Chemical Constituents :

- ❖ Ricinine,
- ❖ Ricin,
- ❖ Resin

பொதுகுணம்:

ஆமணக் கெண்ணெய் தன்னை யணிநில மறிய கேண்மின்
பூமணச் சந்துதோறும் பொருந்திய வாதம் போக்கும்
தீமந்தத் தானும் போக்குந் திகழ்வுடன் விரைவு முண்டாம்
தீமனக் குடலில் வாதஞ் சேர்குட லேற்றம் போமே

- எடு

பொருள் : ஆமணக்கெண்ணெயினால் வாதம் நீங்கும்.

வெள்ளாட்டுப்பாற் குணம்

"வெள்ளாட்டு பாலுக்குமேவியநற் றீபனமாந்
தள்ளாடு வாதபித்தஞ் சாந்தமாம் - உள்ளிரைப்புச்
சீதமதி சாரஞ் சிலேஷ்மமமறும் புண்ணாறும்
வாத சிலேஷ்மமுப்போ மாய்ந்து".

பொருள்

வெள்ளாட்டுப் பாலினால் வாதபித்த தொந்தம், சுவாச காசம், சீதாதிசாரம், கபதோ'ம், விரணம், வாதத்திலுண்டாகிய வீக்கம் முதலிய துன்பந்தீரும். நல்லபசியும் உண்டாமென்க.

Drug storage:

The trial drug KEELVAYU NIVARANA CHOORANAM (internal) is stored in clean and dry airtight container and VATHATHIRKU THYLAM (external) is stored in clean and dry pet bottles.

INTERNAL MEDICINE-KEEL VAYU NIVARANA CHOORANAM

NANNARI VER PATTAI

PARANGI PATTAI

CHITHARATHAI

SEEMAI AMUKKURA

EXTERNAL MEDICINE-VATHATHIRKU THYLAM

VELAI CHARU

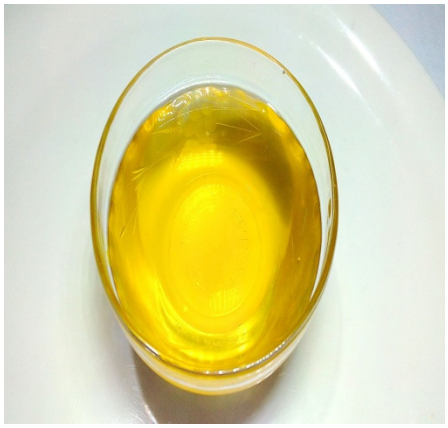
MURUKKILAI CHARU

ERUKKU

MANIPUNGU

GOAT MILK

CASTOR OIL



KEEL VAYU NIVARANA CHOORANAM

VATHATHIRKU THYLAM

ANNEXURES -II

QUALITATIVE AND QUANTITATIVE ANALYSIS

BIO-CHEMICAL ANALYSIS OF KEEL VAYU NIVARANA CHOORANAM (IN POWDER FORM)

PREPARATION OF THE EXTRACT:

5 grams of the drug was weighed accurately and placed in a 250ml clean beaker. Then 50ml of distilled water added to it and dissolved well. Then it was boiled well for about 10 minutes. It was cooled and filtered in a 100ml volumetric flask and then it is made upto 100ml with distilled water. This fluid was taken for analysis.

QUALITATIVE ANALYSIS

S. No.	EXPERIMENT	OBSERVATION	INFERENCE
1	**TEST FOR CALCIUM** 2ml of the above prepared extract is taken in a clean test tube. To this add 2ml of 4% Ammonium oxalate solution.	A white precipitate is formed	Absence of calcium.
2	**TEST FOR SULPHATE** 2ml of the extract is added to 5% Barium Chloride solution	A white precipitate is formed	Indicates the presence of sulphate
3	**TEST FOR CHLORIDE** The extract is treated with silver nitrate solution.	A white precipitate is formed	Absence of chloride.
4	**TEST FOR CARBONATE** The substance is treated with concentrated Hcl.	No brisk efference is formed	Absence of Carbonate

5	**TEST FOR STARCH** The extract is added with weak iodine solution	Blue Colour is formed.	Indicates the presence of Starch
6	**TEST FOR FERRIC IRON** The extract is acidified with Glacial acetic acid and potassium ferro cyanide.	No blue color is formed.	Absence of ferric iron
7	**TEST FOR FERROUS IRON** The extract is treated with concentrated Nitric acid and Ammonium thiocyanate solution.	Blood red colour is formed.	Indicates the presence of ferrous Iron.
8	**TEST FOR PHOSPHATE** The extract is treated with Ammonium Molybdate and concentrated nitric acid	No yellow precipitate is formed	Absence of Phosphate
9	**TEST FOR ALBUMIN** The extract is treated with Esbach's reagent	No yellow precipitate is formed.	Absence of Albumin.
10	**TEST FOR TANNIC ACID** This extract is treated with ferric chloride.	No blue back precipitate is formed	. Absence of tannic acid
11	**TEST FOR UNSATURATION** Potassium permanganate solution is added to the extract.	It gets decolorized	Indicates the presence of unsaturated compound

12	**TEST FOR THE REDUCING SUGAR** 5ml of Benedict's qualitative solution is taken in a test tube and allowed to boil for 2 minutes and add 8-10 drops of the extract and again boil it for 2 minutes	Colour change occurs	Indicates the presence of reducing sugar
13	**TEST FOR AMINO ACID** One or two drops of the extract is placed on a filter paper and dried well. After drying 1% Ninydrin is sprayed over the same and dried it well.	violet colour is formed.	Indicates the presence of Amino Acid.
14	**TEST FOR ZINC** The extract is treated with Potassium Ferro cyanide.	No white precipitate is formed.	Absence of Zinc.

RESULTS AND DISCUSSION:

The Bio chemical analysis of the trial drug *Keelvayu Nivarana Chooranam* was tabulated above in table 2.

The trial drug *Keelvayu Nivarana chooranam* contains.

1. Sulphate
2. Ferrous Iron
3. Unsaturated compound
4. Reducing sugar
5. Amino Acid.
6. Starch

ANNEXURE III

FTIR ANALYSIS OF SIDDHA MEDICINE KEEL VAYU NIVARANA CHOORANAM

FTIR characterization shows the presence of some functionalgroup such as Halo compound, Phenol, Nitro compound, Amine where identified in Siddha poly herbal formulation. “keel vayu nivarana chooranam”.

Keywords : FTIR,Siddha,keel vayu nivarana chooranam .

FTIR characterization was done for the poly herbo and mineral Siddha formulation “SarvangavathaChooranam” to identifythe functional group. Each molecule or chemical structure will produce a unique spectral fingerprint, making FTIR analysis a great tool for chemical identification.Bio chemical analysis was done to evaluate the acid and basic radicals present in the formulation.

INGREDIENTS :

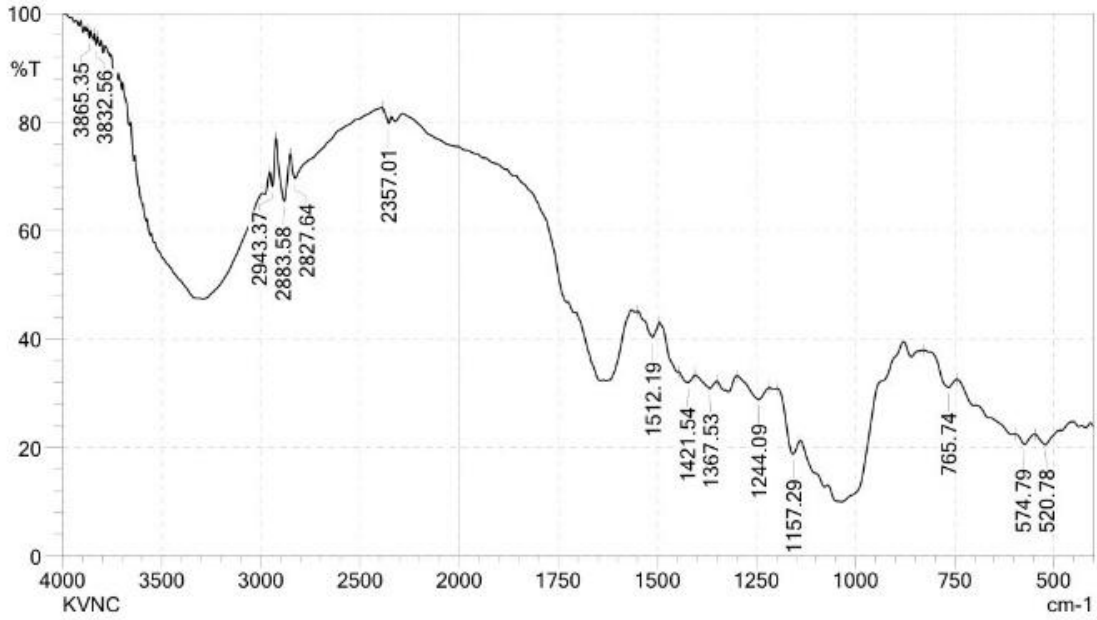
Sl. No.	INGREDIENT	BOTANICAL NAME	PART USED	MEASUREMENT
1.	Nannari ver pattai	Hemidesmus indicus	Bark	10thola(117gm)
2.	Parangipattai	Smilax china	Root	10thola(117gm)
3.	Seemai Amukkura	Withania somnifera	Root	10thola(117gm)
4.	Chitrarathai	Alpinia galanga	Root	5thola(58.5gm)

FTIR Spectrum analysis

Fourier transform infrared spectroscopy is an important and more advanced technique. It is used to identify the functional group to determine the quality and consistency of the sample material and can determine the amount of compound present in the sample.

In FTIR- infrared is passed from a source through a sample. This infrared is absorbed by the sample according to the chemical properties and some are transmitted. The spectrum that appears denotes the molecular absorption and transmission. It forms the molecular finger print of the sample. It is recorded as wavelength and the peaks seen in the spectrum indicate the amount of material present.

Fig.1. Image of the FTIR spectrum.



	Peak	Intensity	Corr. Intensity	Base (H)	Base (L)	Area	Corr. Area	Comment
1	520.78	20.52	2.24	547.78	482.20	5126.739	65.443	
2	574.79	20.58	1.91	597.93	547.78	3929.563	42.199	
3	765.74	31.07	2.84	827.46	744.52	5444.968	71.867	
4	1157.29	18.78	5.36	1197.79	1139.93	4419.935	142.120	
5	1244.09	28.86	2.84	1300.02	1217.08	5745.167	112.372	
6	1367.53	30.88	1.75	1406.11	1350.17	3805.206	48.142	
7	1421.54	32.00	1.62	1446.61	1406.11	2726.715	40.644	
8	1512.19	40.33	3.34	1550.77	1494.83	3215.629	86.761	
9	2357.01	79.68	1.82	2389.80	2341.58	912.634	35.477	
10	2827.64	69.64	4.91	2852.72	2389.80	10583.896	571.358	
11	2883.58	65.37	9.94	2924.09	2852.72	2156.782	408.614	
12	2943.37	68.07	5.24	2956.87	2924.09	948.690	91.262	
13	3832.56	94.19	1.76	3840.27	3824.84	76.928	14.395	
14	3865.35	95.45	1.45	3873.06	3861.49	43.574	7.993	

Table.2: FTIR Data interpretation of KEEL VAYU NIVARANA CHOORANAM

Wave number	Vibrational modes of KVNC In IR region	Functional groups
520.278	C-1 Strech	Halo compound
574.79	C-I Strech	Halo compound
765.74	C-cl strech	Halo compound
1157.29	C-oStrech	Fluoro compound
1367.53	S=OStretch	Sulfonate
1367.53	O-H Bending	Carboxylic acid
1512.19	N-O Strech	Nitro compound
1512.19	N-H Bending	Amine
2357.01	O=C-O Stretch	Carbondioxide
2827.64	C-H Stretch	Alkane
2782.58	C-HStrech	Alkane
2943.37	N-HStrech	Amine salt

In FT-RI SPECTRA ANALYSIS ,This sample keel vayu nivarana chooranam exhibit the peak value at 2782.58520.278, 574.79, 765.74, 1157.29, 1367.53, 1367.53, 1512.19, 1512.19, 2357.01, 2827.64, 2943.37.having C-1 Strech, C-cl stretch, C-oStrech, S=OStretch, O-H Bending, N-O Strech, N-H Bending, O=C-O Stretch, C-H Stretch, N-HStrech.

FTIR RESULTS AND DISCUSSIONS

This indicates the presence of some organic functional groups such asHalo Compound,Fluoro compound, Aromatic Ester, Phenol, Nitro compound, Amine, Alkane respectively.

The presence of Amine commonly used as analgesics in medicine that relieves pain. The presence of aromatics are good pain relievers has anti-pyretic, anti-inflammatory, auto-immune activities.The presence of Halo compounds are used for treatment of typhoid fever.The presence of phenol is an active ingredient in some oral analgesics, likewise the presence of other these identified functional groups in the medicinal compound are also responsible for the therapeutic function of drug “keel vayu nivarana chooranam”

ANNEXURE – IV

PHARMACOLOGICAL ANALYSIS

ANALGESIC ACTIVITY

Analgesic activity of Keel Vayu Nivarana Chooranam at a dose of 100 mg/kg and 200mg/kg was evaluated by acetic acid induced writhing reflux in mice. Painful reaction in animals may be produced by the chemicals such as phenylquinone, bradykinin etc. Like that, acetic acid pain reaction which is characterized as a writhing response. Construction of abdomen, turning of trunk (twist) and extension of hind legs are taken as reaction to chemically induced pain. Analgesics (both narcotic and non-narcotic) inhibit writhing response.

REQUIREMENTS

Animal	:	Swiss albino mice (20-25g) either sex
Drugs and chemicals	:	Diclofenac sodium (standard), Acetic acid (1%v/v), Keel Vayu Nivarana Chooranam.

METHOD

TREATEMENT PROTOCOL

Group 1: Treated as normal control received 10ml/kg of normal saline through orally.

Group 2: Treated as standared control received 10mg/kg of diclofenac sodium through Intraperitoneally.

Group 3: Treated as treatement control received 100mg/kg of Keel vayu nivarana chooranam with 2ml of sterile water administered through orally.

Group 4: Treated as treatement control received 200mg/kg of Keel vayu nivarana chooranam with 2ml of sterile water administered through orally.

Both dose of Keel vayu nivarana chooranam were administered one hour prior to the acetic acid administration. Note the onset on writhing. Record the numbers of abdominal contractions, trunk twist and extension of hind limbs as well as number of animals showing such response during a period of 10 minutes were noted.

STATISTICS

Data are expressed as mean ± SEM; data analyzed by one way ANOVA followed by Newman's keul's multiple range tests to determine the significance of the difference between the control group and rats treated with the extracts.

- Values were considered significant at $P< 0.01$.

TABLE NO.3

ANALGESIC ACTIVITY OF KEEL VAYU NIVARANA CHOORANAM IN AGAINST ACETIC ACID INDUCED WRITHING REFLUX IN MICE

Treatment	Dose (mg/kg)	No.of writhing	% reduction in reaction time
Group I **Normal saline**	Inject 1%v/v acetic acid 1ml/100g of body weight	38.0±3.5	-
Group II **Std**	10mg/kg I.P.Diclofenac sodium	5.50±0.8	85.52%**
Group III **Keel vayu Nivarana Chooranam**	100mg/kg Administered through orally	11.05±3.0	70.92%**
Group IV **Keel vayu Nivarana Chooranam**	200mg/kg Administered through orally	9.8±2.0	74.21%**

Values are expressed as mean ±SEM

Values were find out by using one-way ANOVA followed by Newman's keuls multiple range tests.

** Values were considered significant at P<0.001.

RESULTS

The table values show that analgesic activity of Keel vayu nivarana Chooranam at a dose of 100 mg/kg and 200mg/kg by aceticacid induced writhing reflex. The results reveals that both doses of Keel vayu nivarana chooranam possess significant analgesic activity at P<0.001.

ANTI-INFLAMMATORY ACTIVITY OF KEEL VAYU NIVARANA CHOORANAM AGAINST CARRAGEENAN INDUCED PAW EDEMA IN RATS

The anti-inflammatory activities of Keel vayu nivarana chooranam at a dose of 100mg/kg and 200mg/kg body weight were evaluated using carrageenan induced paw edema method. The inflammation was readily produced in the form of edema with the help of irritant such as carrageenan. Carrageenan is a sulphated polysaccharide obtained from sea weed (Rhodophyceae) and when injected cause the release of prostaglandins by the way it produces inflammation and edema.

REQUIREMENTS

Animal : Albino rat (180-200g)

Drugs and chemicals : Carrageenan (1%w/v), Diclofenac sodium (standard), Keel vayu nivarana chooranam.

Digital plethysmo meter. U G O Basile (Italy)

METHOD

The animals were divided into 4 groups each having six animals.

The animals were divided into 4 groups each having six animals.

TREATMENT PROTOCOL

Group1 : Treated as normal control received 10ml/kg of normal saline through orally.

Group 2 : Treated as Standared control received 10mg/kg of diclofenac sodium through intraperitoneally.

Group 3: Treated as treatment control received 100mg/kg of Keel vayu nivarana chooranam dissolved with 2ml sterile water and administered through orally.

Group 4: Treated as treatement control received 200mg/kg of Keel vayu nivarana chooranam dissolved with 2ml sterile water and administered through orally.

A freshly prepared suspension of carrageenan (1% w/v, 0.1ml) was injected to the planter region of left hind paw of each rat. One group was kept as control and the animals of the other groups were pretreated with the Keel vayu nivarana chooranam given through orally 60 min before the carrageenan treatment. The paw volumes of the tst compounds, standard

and control groups were measured at 60,240, 360 minutes of carrageenan treatment with the help of Digital plethysmometer (Ugo basile, Italy). Mean increase in paw volume was measured and the percentage of inhibition was calculated.

% Anti-inflammatory activity = (Vc-Vt/Vc) x 100

Where Vt-mean increase in paw volume in rats treated with test compounds. Vc-mean increase in paw volume in control groups of rats.

STATISTICS

Data are expressed as mean ± SEM, data analyzed by one way ANOVA followed by Newman's keul's multiple range tests to determine the significance of the difference between the control group and rats treated with the test compounds.

- Values were considered significant at P<0.01.

TABLE NO.1

ANTIINFLAMATORY ACTIVITY OF KEEL VAYU NIVARANA CHOORANAM

Treatment	**Dose (mg/kg)**	**Paw volume (ml) as measured by mercury displacement at 6 hour**	**Percentage inhibition of paw edema**
Group I Normal saline	10ml/kg orally	5.70±0.98	-
Group II Std	10mg/kg I.P.Diclofenac sodium	1.62±0.40	71.57%*a
Group III	100mg/kg Administered through orally	2.0±0.58	64.91%*a
Group IV	200mg/kg Administered through orally	1.74±0.72	69.47%*a

*Data are expressed as Mean ± S.E.M.

*Data were analyzed by one way ANOVA followed by Newman's keul's multiple range tests, to determine the significance of the difference between the control groups and rats treated with the test compounds.

*a Values were significantly different from normal control at P<0.01.

RESULTS

ANTI-INFLAMMATORY ACTIVITY

Keel vayu nivarana chooranam at a dose of 100 and 200mg/kg were tested for their Anti-inflammatory activity by using carrageenan induced rat paw edema method and the results are tabulated in table no.1. The results reveals that both doses of Keel vayu nivarana chooranam 100 and 200 mg/kg possesses significant Anti-inflammatory activity when compared to control group at $p<0.01$.

ANNEXURE - V

ACUTE TOXICITY STUDY

Acute oral toxicity refers to those adverse effects occurring following oral administration of a single dose of a substance or multiple doses given within 24 hrs. Acute toxic class method (OECD guidelines, (2000) was followed to arrive at the maximam safety dose of the drug extracts. Three wistar strain female albino rats (8-12 weeks old, 180-200g body weight) were used in each group. Single dose (2g/Kg) of the keel vayu nivarana chooranam food sample was orally administered to overnight fasted (food but not water withheld) animals while control animals received the vehicle (0.3%w/v CMC). Animals were observed individually after dosing at least once during the first 30 minites, periodically during the first 24h, with special attention given during the first 4 hrs and daily thereafter, for a total of 14 days. Body weights of the animals were recorded. The other observations include changes in skin, fur, eyes and mucous membranes, respiratory, circulatory and autonomic and central nervous system and somatomotor activity and behavior pattern. At the end of 14 days, all animals were subjected to gross necropsy.

STATISTICAL ANALYSIS

Results were expressed as Mean±Standard Error Mean (S.E.M). Statistical significance was determined by one-way analysis of variance (ANOVA) followed by newmann keul's multiple range tests. P values less than 0.05 were considered significant.

Results

Acute toxicitystudy

All of the rats fed with the keel vayu nivarana chooranam showed normal general behavior, respiratory pattern, cardiovascular signs, motor activities reflexes and normal change in skin and fur.

TABLE NO.1

HEMATOLOGICAL VALUES OF KEEL VAYU NIVARANA CHOORANAM IN THE ACUTE TOXICITY STUDY

S.NO.	PARAMETER	CONTROL	SAMPLE
			2g/kg
1.	White blood cells ($X10^3$/µl)	8.15±0.65	7.92±0.35
2.	Hemoglobin (g/dl)	12.75±0.55	11.64±0.36
3.	Mean corpuscular volume	69.50±1.15	69.05±0.90
4.	Mean corpuscular hemoglobin cone.(g/dl)	36.75±0.60	35.25±0.45
5.	Platelet ($X10^5$/µl)	5.50±0.60	5465±0.55
6.	Red blood cell ($X10^6$/µl)	3.72±0.40	3.65±0.50

- Values are expresses as mean ± S.E.M.
- All groups were treated with oral dose of 2g/kg body weight
- No significant different from normal control.

TABLE NO.2

BLOOD CHEMICAL VALUES OF KEEL VAYU NIVARANA CHOORANAM IN THE ACUTE TOXICITY STUDY

S.NO.	PARAMETER	CONTROL	SAMPLE
			2g/kg
1.	Glucose (mg/dl)	112.55±4.85	148.40±4.65
2.	Bun (mg/dl)	35.70±1.62	37.60±1.70
3.	creatinine (mg/dl)	0.46±0.08	0.5±0.18
4.	Total protein (g/dl)	5.30±0.22	5.45±0.35
5.	Albumin (g/dl)	4.15±0.25	4.40±0.40
6.	Total bilirubin (mg/dl)	0.40±0.15	0.48±0.24
7.	AST(u/i)	138.58±4.30	141.05±4.45
8.	ALT(u/i)	87.35±2.35	87.30±2.50
9.	ALP(u/i)	74.40±2.60	75.50±2.75

- Values are expresses as mean±S.E.M
- All groups were treated with oral dose of 2g/kg body weight
- No significant different from normal control.

DISCUSSION AND CONCLUSION

In acute toxicity study for 14 days, at a dose of 2g/kg of Keel vayu nivarana chooranam sample were chosen for the experiment. In the aspect of general behavior the rats treated with food sample at a single dose had no signs of behavior changes and toxic signs. The treated groups revealed no significant differences in body weight gain. The increase of body weight may have resulted from physiological changes in rats such as metabolism, food and water intake. However, the result from animal health monitoring in the entire period of 14 days showed no sign of morbidity and diseases.

The albino wistar rats were healthy as shown by the normal appearance of general behavior, respiratory pattern, cardiovascular signs, motor activities, reflexes and normal change in skin and fur.

In regard to hematological values, most of values in treated groups were normal in comparison with the control group. Significantly, some values were different from those of the control group such as RBC, MCV, MCHC, and platelet. However, such values are within the normal ranges. These variations may have resulted from normal variation among animal groups (Feldman et al., 2000) (Inala et al, 2002). Therefore, these results suggest that the keel vayu nivarana chooranam did not cause hematological or immunological defects in rats.

Furthermore, blood chemical examination was performed in order evaluate any toxic effects on liver. In this study, the levels of these blood chemical values were minor changes and remained within the normal range (Caisey and King, 1980) (Levine, 1995) (Angkhasirisap*et.al.,*2002)..

In conclusion, Keel vayu nivarana chooranam sample given orally to wistar rats did not produce toxicities.

ANNEXURE –VI
ASSESSMENT FORMS

FORM I	**:**	Screening form
FORM II	:	Consent form
FORM III	:	History Proforma
FORM IV	:	Clinical Assessment
FORM V	:	Laboratory investigation
FORM VI	:	Drug Compliance Form
FORM VII	:	Adverse Reaction form
FORM VIII	:	Patient withdrawal form

GOVERNMENT SIDDHA MEDICALCOLLEGE& HOSPITAL,

PALAYAMKOTTAI, TIRUNELVELI DISTRICT.

DEPARTMENT OF SIRAPPU MARUTHUVAM

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FORM-I

(SCREENING AND SELECTION PROFORMA)

1.OPD/IPD No: _____ 2.Date: _____3.SI.No: _____4.Name: _____

5. Age: _____ 6.Gender: _____ 7. Phone No:. _____

INCLUSION CRITERIA:

- Age : 18-60 years
- Sex : both male and female
- Symmetrical joint involvement
- Arthritis of 3 or more joints
- Rheumatoid factor positive
- Morning stiffness
- Swelling especially in the inter phalangeal joint.
- Patients who are willing for admission and stay in IPD for 30 to 48 days or willing to attend OPD
- Patient who is willing to undergo radiological investigation and give blood and urine samples for laboratory investigation.
- Patient willing to sign the informed consent stating that he/she will consciously stick to the treatment during 30 to 48 days but can OPD out of the trial of his/her own conscious discretion.

EXCLUSION CRITERIA:

- Systemic illness.
- Pregnant Women and Lactating Mother
- History of trauma
- Neurological disorder
- Tubercular arthritis
- Any other serious illness
- Psoriatic arthritis
- Gouty arthritis

WITHDRAWAL CRITERIA:

- Intolerance to the drug and development of adverse reactions during drug trial
- Poor patient's compliance and defaulters.
- Patient turned unwilling to continue in the course of clinical trial.
- Occurrence of any serious illness.

DATE :

STATION : Signature of the Investigator

Signature of the Guide/HOD

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FORM-II

CONSENT FORM

Certificate by Investigator

I certify that I have disclosed all details about the study in the terms readily understood by the patient.

Date: ……..

Signature of the Investigator: ……..

Name: ……..

Signature of the Guide/HOD: …….

Name: ……

Consent by Patient

I have been informed to my satisfaction, by the attending physician, the purpose of the clinical trial, and the nature of drug treatment and follow-up including the laboratory investigations to be performed to monitor and safeguard my body functions.

I am aware of my right to withdraw from the trial at any time during the course of the trial without having to give the reasons for doing so.

I, exercising my free power of choice, hereby give my consent to be included as a clinical trial of **KEEL VAYU NIVARANA CHOORANAM** [INTERNAL],**VATHATHIRKU THYLAM** [EXTERNAL]AND **VEDHU** [EXTERNAL THERAPY] IN **UTHIRA VAATHA SURONITHAM**[RHEUMATOID ARTHRITIS].

Date: ……..

Signature: ……

Name: …….

Date: ……..

Signature of Witness: …….

Name…….. ……

Relationship: ……..

அரசினர் சித்தமருத்துவக் கல்லூரி மற்றும் மருத்துவமனை

பாளையங்கோட்டை

பட்ட மேற்படிப்பு சிறப்பு மருத்துவத்துறை

"கீல் வாயு நிவாரண சூரணம்" மற்றும் "வாதத்திற்கு தைலம் - வேது" இவற்றின் பரிகரிப்புத் திறனைக் கண்டறியும் மருத்துவஆய்வுஒப்புதல் படிவம் ஆய்வாளரால் சான்றளிக்கப்பட்டது.

நான் இந்த ஆய்வைக் குறித்த அனைத்து விபரங்களையும் நோயாளிக்கு புரியும் வகையில் எடுத்துரைத்தேன் என உறுதியளிக்கிறேன்.

தேதி :

இடம் :

துறைத்தலைவர் கையொப்பம்:

பெயர்:

ஆய்வாளர்கையொப்பம்:

பெயர்:

நோயாளியின் ஒப்புதல்

என்னிடம் இந்தமருத்துவ ஆய்வின் காரணத்தையும் மருந்தின் தன்மைமற்றும் மருத்துவ வழிமுறையைப் பற்றியும் தொடர்ந்து எனது உடல் இயக்கத்தைகண்காணிக்கவும்,அதனைப் பாதுகாக்கவும் பயன்படும் மருத்துவ ஆய்வுக்கூட பரிசோதனைகள் பற்றியும் திருப்தி அளிக்கும் வகையில் ஆய்வு மருத்துவரால் விளக்கிக் கூறப்பட்டது.

நான் இந்த மருத்துவ ஆய்வின் போது காரணம் எதுவும் கூறாமல் எப்பொழுது வேண்டுமானாலும் இந்த ஆய்விலிருந்து என்னை விடுவித்துக் கொள்ளும் உரிமையை தெரிந்திருக்கின்றேன்.

நான் என்னுடைய சுதந்திரமாகத் தேர்வு செய்யும் உரிமையைக் கொண்டு உதிர வாத சுரோணிதம் என்னும் நோய்க்கான கீல் வாயு நிவாரண சூரணம்" மற்றும் "வாதத்திற்கு தைலம் - வேது ஆகியவற்றின் பரிகரிப்புத் திறனைக் கண்டறியும் மருத்துவ ஆய்விற்கு என்னை உட்படுத்திக்கொள்ள ஒப்புதல் அளிக்கிறேன்.

தேதி :

இடம் :

கையொப்பம்:

பெயர் :

சாட்சிக்காரர்கையொப்பம்:

பெயர்:

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FORM III

HISTORY PROFORMA ON ENROLLMENT

1. Serial No of the case: _____ 2. OPD/IPD No:_____

3.Name: _____ 4. Gender: ☐

5. Age (years): _____ DOB ☐☐ ☐☐ ☐☐☐☐

Date Month Year

6.Address: ----------

7.A. Occupation: ---------- B. Income ----------

8. Educational Status: A) Illiterate ☐ B)Literate ☐

9. Height: ----------cms 10.Weight:----------kg

11. Complaints and Duration:

12. Past History

Hypertension _____

Diabetes mellitus _____

Asthma _____

PT _____

Other _____

13. HABITS

A) Smoking : 1. Yes ☐ duration _____ years; Number- _____ 2.No ☐

B) Alcoholism:1. Yes ☐ duration _____ years; Quantity- ____ ml 2.No ☐

C) Tobacco chewing: 1. Yes ☐ duration _____ years 2.No ☐

D) Betel chewing : 1. Yes ☐ duration _____ years 2.No ☐

14. Dietary style: A.Pure vegetarian ☐ B.Non-vegetarian ☐ C. Mixed diet ☐

15. Drug history:Had the patient been treated before with allopathy drug?

A) Yes ☐ 2) No ☐

16 Marital status**:**1.Married ☐ 2.Unmarried ☐

17. Family history :

Whether this problem runs in family? 1. Yes ☐ 2.No ☐

(If yes, mention the relationship)

☐ ☐

18. Bowel habits & micturition: Normal Abnormal

(Details of an abnormality)

19. Psychological state: Normal ☐ Anxiety ☐ Depression ☐

Signature of the Investigator **Signature of the Guide/HOD**

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PALAYAMKOTTAI, TIRUNELVELI DISTRICT

DEPARTMENT OF SIRAPPU MARUTHUVAM

AN OPEN CLINICAL STUDY TO EVALUATE THE THERAPEUTIC EFFICACY OF SIDDHA POLYHERBAL MEDICINE ***KEEL VAYU NIVARANA CHOORANAM****[INTERNAL],****VATHATHIRKU THYLAM****[EXTERNAL]AND* ***VEDHU****[EXTERNAL STHERAPY] FOR THE TREATMENT OF* ***UTHIRA VAATHA SURONITHAM****[RHEUMATOIDARTHRITIS].*

FORM IV

CLINICAL ASSESSMENT ON ENROLLMENT AND ON VISITS

1. S.No: _____2. OPD/IPD No: _____

3. Name**:** _____4. Gender : _____

5. Date of assessment : _____

SIDDHA SYSTEM OF EXAMINATION

1.NILAM: [LAND WHERE PATIENT LIVED MOST]

Kurinji ☐ (Hilly terrain) Mullai ☐ (Forest range) Marutham ☐ (Plains) Neithal ☐ (Coastal belt) Palai ☐ (Arid regions)

2. KAALAM:

Kaarkalam - ☐ Pinpanikalam- ☐

Koothirkalam - ☐ Ilavenil - ☐

Munpanikalam - ☐ Muthuvenil - ☐

3.THEGI:

4. GUNAM:

Sathuvam - ☐ Rasatham - ☐ Thamasam - ☐

5.IMPORIGAL (SENSORY ORGANS) :

Mei (Skin) :

Vai (Buccal Cavity):

Kan(Eyes) :

Mooku(Nose):

Sevi(Ears) :

6.KANMENDRIYAM (MOTOR ORGANS) :

Kai (Upper limb):

Kaal(Lower limb):

Vai(Buccal Cavity):

Eruvai(Excretory organs):

Karuvai(Reproductive organs):

7.UYIR THATHUKKAL:

A)VATHAM:

Pranan:

Abanan:

Viyanan:

Udhanan:

Samanan:

Nagan:

Koorman:

Kirukaran:

Devathathan:

Dhananjeyan:

B)PITHAM:

Analpitham:

Ranjagam:

Sathagam:

Prasagam:

Aalosagam:

C)KABAM:

Avalambagam:

Kilaethagam:

Pothagam:

Tharpagam:

Santhigam:

8.UDAL THATHUKKAL:

Saaram[Chyme]:

Senneer[Blood]:

Oon[Muscle]:

Kozhuppu[Fat]:

Enbu[Bone]:

Moolai[Bone Marrow]:

Sukkilam/Suronitham

[Genital Discharges] :

9.ENVAGAI THERVUGAL:

Naadi:

Sparisam:

Naa:

Niram:

Mozhi:

Vizhi:

Malam:

Moothiram:

10.NEER KURI:

Niram:

Manam:

Nurai:

Edai:

Enjal:

11.NEI KURI:

GENERAL EXAMINATION:

Conscious level:

Body weight:

Height:

BMI:

Built:

Nourishment:

Temperature:

Blood Pressure:

Pulse rate:

Heart rate:

Respiratory rate:

Anaemia:

Jaundice:

Clubbing:

Cyanosis:

Pedal oedema:

Significant Lymphadenopathy:

SYSTEMIC EXAMINATIONS:

Central Nervous System:

Cardio Vascular System:

Respiratory System:

Gastro Intestinal System:

Genito Urinary System:

EXAMINATION OF JOINTS:

Joints Involvement :

Morning Stiffness :

Pain type : Recurrent attack / Episodic / Flitting or Migratory

Inspection:

Spinal deformities: Kyphosis/ Scoliosis/ Lordosis / None

Swelling:

Deformity:

Palpation:

Tenderness:

Heat:

Fluid accumulation:

Crepitus:

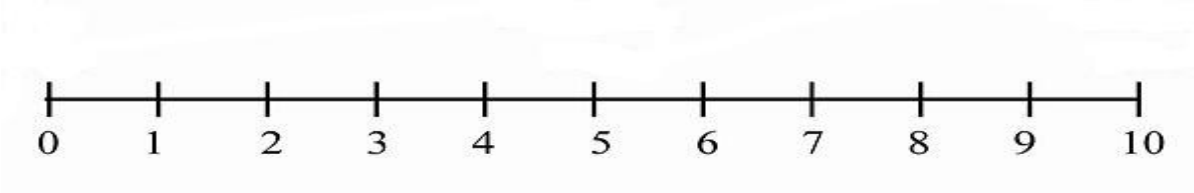
Movements:

CLINICAL ASSESSMENT:

S.NO	SIGNS & SYMPTOMS	BEFORE TREATMENT	AFTER TREATMENT
1	PAIN		
2	SWELLING		
3	REDNESS		
4	TENDERNESS		
5	JOINT STIFFNESS		
6	JOINT DEFORMITY		
7	LOSS OF JOINT RANGE OF MOTION		

PAIN ASSESSMENT:

UNIVERSAL PAIN ASSESSMENT SCALE



A. 0 : No Pain

B. 1 -3 : Mild pain

C. 4-6 : Moderate pain

D. 7-10 : Severe pain

Reference: Clinical Manual for Nursing Practice. (National Institute of Health Warren Grant Magnuson Clinical Center)

GRADATION:

Grade 1: Fit for all activities to do their work without support (Normal)

Grade 2: Mild Pain and Mild restriction of Movements

Grade 3: Moderate Pain and Moderate restriction of Movements

Grade 4: Severe Pain and Severe restriction of Movement

S.NO	ASSESSMENT	BEFORE TREATMENT	AFTER TREATMENT
1	Pain Assessment		
2	Gradation		

OVERALL ASSESSMENT CRITERIA OF THE STUDY

Signature of the Investigator **Signature of the Guide/HOD**

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FORM V

LABORATORY INVESTIGATION FORM

SI.No:

OPD/IPD No:

Name:

Age/Sex:

I.BLOOD

		Before Treatment	After Treatment
1	TC (cells/mm)		
2	DC (%)		
	a)Neutrophils		
	b)Lymphocytes		
	c)Monocytes		
	d)Eosinophils		
3	ESR(mm)		

	a)1/2 hour		
	b)1 hour		
4	Haemoglobin		
5	Blood glucose		
6	Blood urea/ creatinine		
7	Serum cholesterol		

II.URINE

		Before Treatment	After Treatment
1	Albumin		
2	Sugar		
3	Epithelial cells		
4	Pus cells		
5	Red blood cells		
6	Casts/Crystals		

SPECIAL INVESTIGATION:

RA FACTOR:

Date :

Station :

Signature of the Investigator **Signature of the Guide/HOD**

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FORM VI

(DRUG COMPLIANCE FORM)

OPD/ IPD No : _____ DOA : _____

Name : _____ Age/Sex : _____ S.No : _____

Name Of The Drug : **KEEL VAYU NIVARANA CHOORANAM**

DATE:

SIGNATURE OF THE INVESTIGATOR SIGNATURE OF THE GUIDE/HOD

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FORM VII

ADVERSE DRUG REACTION FORM

Name: _____ OPD/ IPD No : _____

Age: _____ Gender: _____

Date of trial commencement: _____

Date of withdrawal from trial: _____

Description of adverse reaction: _____

_____

Date:

Station:

SIGNATURE OF THE INVESTIGATOR SIGNATURE OF THE GUIDE/HOD

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FORM VIII

WITHDRAWAL FORM

Name: _____ OPD/ IPD Number: _____

Age : _____ Gender : _____

Date of trial commencement: _____

Date of withdrawal from trial: _____

Reasons for withdrawal:	YES	NO
• Long absence in without reporting :	: Yes	No
• Irregular treatment :	☐	☐
• Shift of locality :	☐	☐
• Increase in severity of symptoms :	☐	☐
• Development of severe adverse drug reactions :	☐	☐

Date :

Station :

SIGNATURE OF THE INVESTIGATOR SIGNATURE OF THE GUIDE/HOD

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