A STUDY ON

UTHIRAVATHA SURONITHAM

(DISSENTATION SUBJECT)

For the partial fulfillment of the requirements to the Degree of

DOCTOR OF MEDICINE (SIDDHA)

BRANCH I – POTHU MARUTHUVAM DEPARTMENT

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INTRODUCTION
INTRODUCTION

Siddha is a holistic medical system that gives importance to mental as well as physical well beings of a patient. The word siddha means "established truth". The word siddha comes from the word siddhi that means an object to be attained such as perfection in life or heavenly bliss.

Medicine is all about preventing and treating ailments thus postponing death. As interesting aspect of siddha medicine is its view about death. Thirumoolar defines the ailment of the body and mind as diseases. In the same breath he defines death as disease and hence could be prevented.

Siddhars not only defines death as disease, but they also earnestly tried to prevent death by advocating life style modification and developing new drugs. Siddha drugs are derived from natural sources such as plants, animals and minerals. Plant drugs are its mainstay. The standing instruction of siddhars to medical practitioners is to use herbal drugs first in any ailment, if herbal drugs are ineffective then only advised to go herbomineral preparations.

"What exists in the world exists in Man". Siddha propounds that the physical structures of the universe and man are basically made up of same stuff, namely five elements. They are nilam (earth), neer (water), thee (fire), kaatru (air) and vin (sky). These five elements are present in different proportions in all living and nonliving
things including drugs and diet articles. Various tissues of the body are the combination of these five elements in different proportions.

The physical function of the body is mediated and maintained by three forces. They are vali, Azhal and iyam. In normal state they are called three forces or three thathu that sustain and nourish the body. In disease state when the three forces are vitiated they are called mukkutrams. When these three forces are in balance one is healthy. When vitiated singly or combination bring about disease.

Seven pillars or fundamental tissues called thathus supporting every living body. When the three forces are vitiated the tissues, disease will occur.

Various siddhars classified disease, one of is Yugi munivar. Yugi munivar classifies disease based on clinical signs and symptoms along with humoral pathology. Yugi classified vatha diseases in to 80 types in "Yugivaithiya chinthamani". Uthiravatha suronithan is one of them.

The disease Uthiravatha suronitham has a very close relevance to Rheumatoid arthritis. The disease Uthiravatha suronitham involving multiple system of the body especially musculoskeletal system affected first and then other systems are affected depends upon their immunology. Single and herbal drug therapies are not much useful to cure the disease. So only the author selected herbomineral drug for internal medicine.

_Anupoga vaithiya navaneetham_ said that the _Rasapralaya chenthuram_ is good for vatha diseases and _Theraiyar thylavarukka surukkam_ describes the _Navanatha siddhar thylam_ is useful to reduce inflammatory conditions of vatha diseases. The principle drugs Rasapralaya chenthuram which is useful in chronic musculoskeletal disorder and Navanatha siddhar thylam is an external application reducing inflammatory condition because of its contents has effective anti-inflammatory action.

All the above drugs are found very effective in Uthiravatha suronitham, which I selected for dissertation. This is a small effort on my part in this regard. Further, study in this regard has to be continued in the course of time with Almighty’ grace.
AIM AND OBJECTIVES
AIM AND OBJECTIVES

The knowledge of preserving one’s health sound and thus prolonging life is said to have descended in this modern technological world. The prolonged and uncertain course of the disease "Udhira Vatha Suronitham" calls for special emphasis and intended the author to bring an ideal treatment for the disease.

Medicine, as everyone knows is not a mere science, but is an art as well. It is the only want of men with such knowledge of science and its practical practice with efficacious cures on hand.

- The principal aim of the present study is to estimate the efficacy of the siddha drugs *Rasapralaya chenthuram* and *Navanatha siddhar thylam*.
- To ensue a new approach in diagnosis for the disease.
- To know whether the drug has any side-effects or not.

OBJECTIVES:

★ The main objective of the present study is to create awareness about the siddha sciences and to highlight the efficacy of siddha drugs among the public.

★ To collect various informations about “Uthiravatha Suronitham” and to expound the characteristics of etiology, premonitory symptoms, signs and pathogenesis based on both siddha and modern aspects.

★ To access the prevalence of the disease with reference to age, sex, diet habits, socio economic status, family history etc.

★ To highlight the siddha diagnostic principles in diagnosing the disease.
★ To conduct a thorough study on *Uthiravatha suronitham* with *Rheumatoid arthritis*.

★ To make a clinical trial with necessary investigations.
To have a complete study of the disease Uthiravatha suronitham, under the headings of
   (a) Pori Pulangal       (b) Mukkutram
   (c) Udal Kattugal       (d) Ennvagai thervugal etc.

To evaluate the pharmacological study on the trial drug.

To study the bio-chemical and chemical analysis on the trial drug.

To evaluate the efficacy of the trial medicine on Antimicrobial activity by in vitro studies.

To conduct a clinical trial with a well defined proforma on identified patients of Uthiravathasuronitham.
REVIEW
OF
LITERATURE
SIDDHA ASPECT
SIDDHA ASPECT

The things exist in the universe also exist in the human beings. Any adverse changes of these two, even a minute change will be reflecting on the other.

In siddha system of medicine, the physiological function in human system is mediated by three substances viz, Vatham (vali + veli), Pitham (thee), Kabham (neer + man). These three humors maintain the upkeep of the human body through their combined functioning. When deranged, they bring about diseases peculiar to their influence. Uthiravatha suronitham the disease taken for study is one of the vatha diseases described by Yugi vaithya chinthamani.

DEFINITION OF VATHAM:

Vatham is a clinical condition characterized by pain, swelling, pricking sensation and loss of function due to vitiated vatha, which is the principle humour of the body.

Vatham is being hailed as the king, who rules the fort (Body) and enables the dwelling of the citizen (Uyir) in the fort. Hence Theraiyar lauds Vatham as the prime force in normal state.

AETIOLOGY: (எதிக்க வாதம்)

According to Yugi Vaidhya chinthamani the disease is caused by various factors.
Excessive sexual indulgence, over consumption of bitter, astringent and salty-tasted foods, alcoholism, and daytime sleep, night time over work, starvation and lifting over weight will aggravates Vatham.

Pararasasekaram describes the factors for vitiation of vatham:

"Consumption of excessive bitters, astringents, salty tasted foods, rancid foods, Daytime sleep and lacking of night sleep vitiates Vatham.

According to Sabapathy Kaiyedu:
CHARACTERISTICS OF VATHA DISEASE:

"Loss of appetite, pain and redness, fever, cough, insomnia, shivering and pain in all over the joints."

- Rajaratnam.
Chillness of the body, rigor, spasm, pain and tenderness over the joints and swelling of the joints.

"கால்மொழி மார்பேற்ற கால்பேரளச் சாலையுடன் புலன் குள் புரிகுலம் நிலத்தில் குழிக் கால்மொழி உரியேர் குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா குன்றை பயன்படுத்தி தாமைறா கு

From the above poetic versions, it is clear that the major characters of vatha diseases are joint pain, swelling present over the joints, difficulty in walking, constipation, burning micturition, oliguria, dyspnoea, flatulence, fever, fatigue, giddiness and nerve weakness etc.

SURONITHA NOI:
Suronitha Vatham is a disorder of menstruation in women characterized by affection in chest and limbs, extreme sensibility to pain, dryness in the skin, pain in nerves accompanied by intense bodily pain.

**VATHA SURONITHAM:**

Yugi Vaidhya Chinthamani classified Vatha suronitham into 7 types. They are:

1. Vatha Suronitham
2. Uthiravatha Suronitham
3. Sithuvatha Suronitham
4. Vaikithavatha Suronitham
5. Paithiyavatha Suronitham
6. Slethuma vatha Suronitham
7. Udharavatha Suronitham

1. VATHA SURONITHAM:

“அஹில்தி அகந்தான குணமுணிய மகிழ் அசையாண கிள்கராகி நிற்கமாகி
நிலிப்பிள்ளை போலட்டி கரியற்றுத்
மலர்து மீது மேலில் நிற்கமாகி
தோய்குடியால் மேகணத்து கூடழ் கூடணி
தோய்குடியால் மேகணத்து கூடழ் கூடணி
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நிலிப்பிள்ளை போலட்டி கரியற்றுத்
மலர்து மீது மேலில் நிற்கமாகி
நிலிப்பிள்ளை போலட்டி கரியற்றுத்

Emaciation, swelling of joints, restricted movement, pain, tenderness, discomfort, loss of appetite and excessive salivation.

2. UTHIRAVATHA SURONITHAM:

“நந்தியாலைத் தரமத்தாலும் புருவத்தான குருடன்
தோய்குடியால் மேகணத்து கூடழ் கூடணி”
Pain and swelling in ankle joints, knee joints and all small joints of the hands and toes.

3. PAITHIYAVATHA SURONITHAM:

Pain in all over the body, pain in elbow joints, knee joints, fingers, cheek, forehead, hyper pyrexia, and anemia.

4. SLETHUMAVATHA SURONITHAM:

Chillness of the body, headache, cough with dyspnoea, disturbed sleep, dryness of the mouth, tastelessness and palpitation.
5. UTHARAVATHA SURONITHAM:

Fever with rigor, dryness of the mouth, headache and analgia, giddiness, passing loose stools, thirst and excessive appetite.

6. SITHUVATHA SURONITHAM:

Wrinkled skin, accumulation of phlegm in the throat, vesicles presents all over the body, exfoliation and anasarca.

7. VAIKITHA VATHAM:

"..."
Swelling, hematomas, cough, hyperpyrexia, numbness in soles and pain in all over the body.

**Dhanvanthi Vaithyam quotes the clinical feature of Sonitha Vatha rogam as:**

"मगांलेठ तळांकणे सामने दर्शिप्रति भावनाले प्रकटम बचलाने तळांकणे दर्शिप्रति भावनाले 

प्रतिविमुखी गुलामें तेंदू अंध्याला विधानाला 

माधील बरतववरून असिरोज्याला आराधना""

"अमान्यत अडणारा काळाती किती साधुरणावर शरीर्भर काळात उत्तम वस्त्र वेचेत उत्तम 

सहरावसाने विद्युत मातृका बाध्य किंवा नाविकाडून निकाले 

सहरावसाने विद्युत मातृका बाध्य किंवा नाविकाडून निकाले 

तामास्त कळणे विद्युत मातृका बाध्य किंवा नाविकाडून निकाले"

Pyrexia and swelling of the body as in rat poison intoxication, pain and tenderness, twitching of muscles, loss of sensation, swelling of wrist and phalanges, black and redness of swelling due to vascular failure and hyperaemia.

**Pararasa Sekaram classifies Vatha suronitham into five headings.**

Pararasa Sekaram describes Suronitham as,

"पिन्नाक्के सत्यवाचार्यावि विद्वाने विद्वानमार्गाने 

हस्ताक्षर साधुरणातील शरीरात तेंदू उत्तम वस्त्र वेचेत 

सहरावसाने विद्युत मातृका बाध्य किंवा नाविकाडून निकाले 

सहरावसाने विद्युत मातृका बाध्य किंवा नाविकाडून निकाले"

Debility in raktha thathu (anaemia), swelling of peripheral joints, deformed movement of joints, pain in upper and lower limbs.

**Uthira Vatham in Pararasa Sekaram:**

"पिन्नाक्के सत्यवाचार्यावि निपुलकर तेंदूतील 

हस्ताक्षर साधुरणातील शरीरात तेंदू उत्तम वस्त्र वेचेत 

शरीरात तेंदू उत्तम वस्त्रासारखे मातृका बाध्य किंवा नाविकाडून निकाले"
Pain and tenderness of chest and axilla, emaciation, pain and swelling of upper and lower limbs.

CLINICAL FEATURES OF VATHASURONITHAM:
“Pain and tenderness, exfoliation, eruption as in burns and swelling in joints.

Soft swelling on touch and pricking nature of pain.

CLINICAL FEATURES OF SEETHAVATHA SURONITHAM:
Swelling of the knee joint, ankle joint and feet, pain and swelling over the phalanges.

CLINICAL FEATURES OF PAITHYAVATHA SURONITHAM:
Pain and swelling of the metacarpo phalangeal joints and proximal interphalangeal joints and headache.

**CLINICAL FEATURES OF SILETHUMAVATHA SURONITHAM:**

“…Pain and swelling of joints, headache.

**CLINICAL FEATURES OF UTHARAVATHA SURONITHAM:**

“…Chillness of the body, tenderness and swelling of the joints.

Chillness of the body, tenderness and swelling of the joints.

**Vitiation of Vatha aggravates the signs and symptoms of Vatha Suronitham.**

The term suronitha vatha is also mentioned in Aathma Ratchamirtham, Anuboga Vaithya deva ragasiyam handled the term Uthiravatha surothinam as Sonitha vatha Rogam.

Our text book *Siddha maruthuvam* handle the term Uthiravatha Suronitham as *Vali Azhal Keelvayu* as per Literature *Sabhabathi Kaiyedu*.

**MUKKUTRA VERUPADUGAL (SIDDHA PATHOLOGY)**

“...”

- *Njiauh; fhg;gpak;.*

(thj; - mrd;> gj;jk; - ke;jphp> fgk; - Nrdhjpgjp)
Which highlights that the main factor in the causation of the disease are vatham, pitham and kabham.

VATHAM:

Vatham is the prime force that impacts movement to every living cell in the body. Its dwelling place lies in the bones, muscles, nerves, joints etc. Hence it is responsible for the movement of parts involved in locomotor system. When vatham is affected, the other two pitham and kabham also gets deranged and in turn, they vitiates the other structural and functional elements of the living body called seven Udal thathus.

- **Viyaanan** which is responsible for the voluntary and involuntary movements and nutrition of the tissue gets affected leading to restriction of movements and lassitude.
- **Samaanan** which neutralizes other vitiated vayus gets affected. Further it is needed for normal digestion. So derangement of this vayu produces loss of appetite and indigestion.
- Involvement of Abaana Vayu also plays a main role in the manifestation of signs and symptoms. **Abaanan** which is responsible for distribution and assimilation of nutritional factors gets affected leading to symptoms like constipation.
- **Kirukaran** and **Thevatham** are also affected because of loss of appetite and sleeplessness respectively.

PITHAM:

The main function of pitham which represents agni is thermogenesis or heat production, metabolism within its limits, process of digestion etc. Its vitiation produces inflammatory changes in joints. Among the five types of Pitham, the following four types get affected in Udhiravatha Suronitham.
- **Ranjaga pitham** which gives colour to blood.
- **Saathaga pitham** which is needed to carry out normal activities.
- In few, **Anal pitham** which is needed for digestion gets affected leading to anorexia.
- **Prasaga pitham** which gives complexion to skin gets affected leading to pallor of skin.

**KABAM:**

The deterioration of the two main kuttram accompany the Kabha kutram whose structure is Earth + Water and is concerned with the maintenance of smooth working of joints, integration of structural elements of the body into stable structures etc.

- **Santhiga kabham** which is needed for normal maintenance of synovial fluid gets affected.
- **Avalambagam** which forms the basis for all the other four types of Kabham gets affected.
- In few, **Kilethagam** gets affected leading to loss of appetite.

**Thus disturbance in Mukkutram produces,**

- Pain, swelling of joints, joint stiffness, restriction of movements, loss of appetite and sleeplessness and constipation due to vatham.
- Inflammatory changes in joints like redness, warmth, loss of appetite and anemia due to pitham.
- Erosion of bony margin, osteoporotic changes, increases in the synovial fluid are due to disturbed kabham.

**UDALTHATHUUKKAL:**

Disturbances in vatham, pitham and kabham gets reflected on Udal thathus leading to change in normalcy of body or predisposition to causing disease. The seven udal thathus that supports the body in their state of equilibrium are as follows.
1. Saaram - Strengthens the body and mind.
2. Senneer - Gives power, knowledge and boldness to the mankind.
3. Oon - It gives structure and shape to the body and is responsible for movements of the body.
4. Kozhuppu - It lubricates the joints and organs and facilitates their functions.
5. Enbu - It protects all the internal organs and forms structural framework of the body.
6. Moolai - Resides inside the core of bones. It strengthens and maintains the normal condition of bones.
7. Sukkilam/ - Meant for reproduction (Male and Female Suronitham respectively).

In Uthiravatha suronitham, the affected Udal thathus are,

- Saaram - Loss of appetite, lassitude.
- Senneer - Anaemia, presence of RA factor).
- Oon - Muscle wasting, swelling.
- Kozhuppu - Emaciation, restriction of joint movements.
- Enbu - Vague pain and swelling of joints and deformity of joints.

DIFFERENTIAL DIAGNOSIS:

Yugi Munivar in his “Yugi Vaidhya Cinthamani” mentioned about 80 types of Vatha diseases. Among them, the following diseases have joint pain as main clinical feature.

1. Oorusthamba vatham.
2. Malaitthakamba vatham.
3. Santhu vatham.
4. Paithiya vatha suronitham.
5. Vatha suronitham.

1. அருஷத்மா வாதம் (Oorusthamba vatham):

Pain in both the thighs, swelling of fingers and toes, numbness, generalized edema of the body and inability to walk are the symptoms of this disease.

2. மலைதக்கம்ப வாதம் (Malaithakamba vatham)

Congestion of wrist joint, twitching, tremors in upper and lower extremities, numbness below the hip joint, fissured lips and passing foul flatus will be seen.

3. சன்க வாதம் (Santhu vatham):

"Congestion of wrist joint, twitching, tremors in upper and lower extremities, numbness below the hip joint, fissured lips and passing foul flatus will be seen."
Pain in joints, body pain, pilo erection, inability to walk, giddiness, dryness of the tongue, excessive salivation and unable to keep the limbs in floor are the features of this disease.

4. பாய்தியவாத சிக்கலிக்கும் (Paithyavatha suronitham)

Generalised body pain, severe pain in the knee joint, elbow joint, minor joints, temporo mandibular joint and all other joints, fever and anemia are the features of this disease.

5. வாதச் சிக்கலிக்கும் (Vatha suronitham)
Emaciation, swelling in movable joints, inability to walk, tremors, anorexia, increased sleep and excessive salivation are the features of this disease.

**DIFFERENTIAL DIAGNOSIS (NOI NITHANAM)**

Uthiravatha suronitham is differentiating from other types of vatha suronitham as follows:

<table>
<thead>
<tr>
<th>S.NO</th>
<th>DISEASES</th>
<th>SIGNS AND SYMPTOMS</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Uthiravatha suronitham</td>
<td>• Swelling of ankle joints, hip joints and knee joints.</td>
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<td></td>
<td></td>
<td>• Pain and tenderness of minor joints especially phalanges.</td>
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<td>• Depression.</td>
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<td>• Loss of appetite.</td>
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<td>• Increased vatha and pitha.</td>
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**DIFFERENTIAL DIAGNOSIS**

<p>| 1.  | Vatha suronitham | • Emaciation.                                                                     |
|     |                  | • Swelling of joints.                                                            |
|     |                  | • Restricted movements.                                                          |
|     |                  | • Joint pain.                                                                    |
|     |                  | • Discomfort.                                                                    |
|     |                  | • Excessive salivation.                                                          |
|     |                  | • Loss of appetite.                                                              |</p>
<table>
<thead>
<tr>
<th></th>
<th>Condition</th>
<th>Symptoms</th>
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</table>
| 2. | Sithuvatha suronitham                         | • Anasarca.  
• Wrinkles.  
• Neural pain.  
• Glossy tongue.  
• Sialorrhoea.  
• Bullous eruption as in burn.  
• Exfoliation, swelling and warmthness. |
| 3. | Vaikithavatha suronitham                     | • Swelling with hyperemia.  
• Soft on touch.  
• Cough with pyrexia.  
• Irritability. |
| 4. | Paithiyavatha suronitham                     | • Hyperemia.  
• Tenderness in knee, elbow and smaller joints.  
• Poly arthralgia.  
• Pyrexia.  
• Anemia. |
| 5. | Slethumavatha suronitham                     | • Chillness with abdominal distension.  
• Severe pain and headache.  
• Syncope and hallucination.  
• Dryness of mouth and anorexia.  
• Tachycardia. |
| 6. | Utharavatha suronitham                       | • Fever with rigor.  
• Dryness of mouth.  
• Pain in all over the joints.  
• Headache, Giddiness.  
• Diarrhoea.  
• Excessive thirst. |
NAADI PATHOLOGY:

Vitiation of vatham and pitham produces joint pain.

Increases vatham results abdominal distension and pain in the joints.

Vitiated vatham causes difficulty in walking and impaired functioning of the lower extremities.
MODERN ASPECT
ANATOMY:

Articulations or Joints are specialized anatomical structures at which the ends of certain bones are joined or the borders of other bones are juxtaposed. These osseous junctions are secured by ligaments, fibrous capsule and other binding tissues, which restrict movements or permit varying degrees of movements. Joints vary widely in their structure, frequently presenting unique morphological features, adapted to specific functional requirements.

JOINT CLASSIFICATION:

Depending on the morphological characteristics of the joints, they are classified into,

- **Fibrous Joints** - Many of which are immovable and are united by fibrous tissue (synarthroses).
- **Cartilaginous Joints** - Slightly movable, the union between the bones occurs via cartilage (amphiarthroses).
- **Synovial Joints** - Freely movable (diarthroses).

SYNOVIAL JOINTS:

Synovial Joints are highly evolved articulations which permit free movements. Because the human lower limbs are concerned with locomotion and the upper limbs provide a great versatility of movements, it is not surprising that most of the joints are of the synovial type. The integrity of synovial joint results from its ligaments and capsule which bind the articulation externally and to some extent from the surrounding muscles. The contiguous bony surfaces are covered with hyaline cartilage and the joint cavity is surrounded by a fibrous capsule, the inner surface of which is lined by a synovial layer containing cells that are thought to secrete the viscous lubricating synovial fluid.
STRUCTURES:

Articular Cartilage firmly adherent to the articular surfaces of majority of bones. They are either innervated or supplied with blood vessels.

Ligaments are composed mainly of bundles of collagenous fibres. They are pliant and flexible to allow perfect freedom of movement.

Articular Capsule forms a complete envelope for a freely movable joint and consists of external fibrous layer and internal synovial layer. The fibrous layer gets attached to the periosteum along the entire circumference of the articular end of each bone. Its flexibility permits movement, yet its strength protects joint from dislocation.

Synovial Membrane covers the inner surface of the fibrous capsule, forming a closed sac called the synovial cavity. It is composed of loose connective tissue and it has a free surface of finger like projection called the Synovial villi. The synovial cavity contains only enough synovial fluid to moisten and lubricates the synovial surface, but in an injured or inflamed joint, the fluid may accumulate in painful amounts.

PHYSIOLOGY OF JOINTS:

As joint is a very well engineered structure, frictionless motion is provided by the combination of a smooth articular cartilage as well as lubrication of both the articular cartilage and the synovial membrane together which make up the entire surface area of the inside of the joints. Shock absorption to the joint is provided by the combination of structures, including articular cartilage, subchondral bone and soft tissue structures (Joint Capsule and Ligaments). Because of its re-silent nature and ability to compress, articular cartilage in itself is a good shock absorber but its thickness and overall volume is far less than bone or soft tissues. Hence the soft tissues and bones are the primary shock absorbers in joint and any disease that affect bones or soft tissue is going to interfere with this shock absorption. Re-silence of the soft tissue is important for normal motion as well as shock absorption. Hyaluronic acid provides lubrication to
the synovial membrane surface in addition to another protein structure called Lubricin and is involved in the lubrication of articular cartilage. The substance moving over the surface of joints is called Boundary Lubrication. A second mechanism of lubrication of cartilage is affected by fluid being squeezed out of the cartilage on to the surface when weight bearing occurs.

**RHEUMATOID ARTHRITIS:**

Rheumatoid arthritis embraces an amazing array of hereditary and acquired disorder with a wide variety of clinical features. Rheumatoid arthritis is a disease of unknown cause, and the current thinking is that interplay between genes, infectious agent contributes to initiate an autoimmune disease mechanism that results in inflammation, dominantly at limb joints, often with destructive features. The term rheumatoid arthritis was first used by sir Archibald Garrod to describe a chronic non-suppurative inflammatory arthropathy (Rheuma - flux, eidos - resemblance), a condition resembling rheumatism.

We are all familiar with the saying regarding rheumatic fever, “It licks the joints but bites the heart.” Contrarily it can be said of rheumatoid arthritis, “It bites the joints, licks all other systems of the body and barks at the treating physician.”

**DEFINITION:**

Rheumatoid arthritis is a highly inflammatory polyarthritis often leading to joint destruction, deformity and loss of function. Additive, symmetric swelling of peripheral joints is the hallmark of the disease. Extra-articular features and systemic symptoms can commonly occur and may antedate the onset of joint symptoms. Chronic pain, disability and excess mortality are unfortunate sequelae.

**FREQUENCY:**

The worldwide incidence of RA is approximately 3 cases per 10,000 population and the prevalence rate is approximately 1%. First degree relatives of patients with RA have an increased frequency of disease (2-3 %). Disease concordance in monozygotic twins is approximately 15-20% suggesting that non-genetic factors play an important role.
AETIOLOGY:

The cause of rheumatoid arthritis is unknown. Genetic, environment, immunologic, and infectious factors may play significant roles. Socioeconomic, psychological and lifestyle factors may influence disease outcome.

1. Age:

The frequency of RA increases with age and peaks in persons aged 25-50 years. Nevertheless, the disease is observed in both elderly persons and children.

2. Sex:

Women before menopause are affected 3 times more often than men. After the menopause the frequency of onset is similar between the sexes, suggesting an etiological role for sex hormones.

3. Genetic:

- The disease is familial but sporadic. In occasional families it affects several generations.
- **HLA types**: There is strong association between susceptibility to RA and certain HLA heliotypes. HLA – DR4 which occurs in 50 – 75% of patients. In addition, HLA-DR1 also carries this shared epitope and confers risk in certain areas.

4. Environmental:

For many decades, numerous infectious agents have been suggested to induce RA. Among these are Mycoplasma organisms, Ebstein-Barr and Rubella viruses and others.

This supposition is further supported indirectly by the following:

- Occasional reports of flulike disorders preceding the stage of arthritis.
- The inducibility of arthritis in experimental animals with different bacteria or bacterial products (eg, streptococcal cell walls)
- The presence of bacterial products including bacterial RNA in patient joints.
- The activity of several agents that have antimicrobial effects as disease-modifying drugs (e.g. antimalarials).
5. Immunologic:

All of the major immunologic elements play a fundamental role in the initiation, propagation and maintenance of the autoimmune process of RA. The exact orchestration of the cellular and cytokine events that lead to pathologic consequences, such as synovial proliferation and subsequent joint destruction, is complex. It involves T and B Lymphocytes, antigen-presenting cells (e.g. B cells, macrophages, dendritic cells) and numerous cytokines. Aberrant production and regulation of both pro and anti-inflammatory cytokines and cytokine pathways are found in RA.

T cells are assumed to play a pivotal role in the initiation of RA and the key player in this respect is assumed to be the Th1 CD4 cells.

These cells may subsequently activate macrophages and other cell populations, including synovial fibroblasts. The latter 2 populations are the main producers of the proinflammatory cytokines TNF-alpha and IL-1 that appears to be the major driving forces of inflammation.

B cells are important in the pathologic process because they may serve as antigen-presenting cells and activated T cells produce numerous autoantibodies (e.g. RF, Citrullinated proteins) and secrete cytokines.

6. Onset:

Mostly onset is insidious.

75 % - insidious onset.
15 % - Acute onset.
10 % – Sub acute onset.

IMMUNOPATHOLOGY:

The pathological hallmark of RA is synovial membrane proliferation outgrowth associated with erosion of articular cartilage and subchondral bone. In early stages, the most obvious histological changes are confined to the synovial microvasculature which shows evidence of endothelial damage, infiltration by polymorpho nuclear leucocytes and obliteration by thrombus. In chronic phase, polymorpho nuclear leucocytes are less
obvious but the synovium is infiltrated by large number of inflammatory cells (macrophages, T&B lymphocytes, dendritic cells, plasma cells). The plasma cells in the subsynovium synthesize large quantities of immunoglobulin, much of which is IgM and IgG rheumatoid factor. They have the ability to form immune complexes that can activate complement and is important in either initiating or prolonging local inflammation within the joint. Antigen-Antibody complexes formed within the joint cavity can become trapped in hyaline cartilage and fibrocartilage, where they cause changes in matrix macro molecules. Ultimate destruction of cartilage, bone, tendons and ligaments probably results from proteolytic enzymes, metallo proteinases.
CLINICAL FEATURES:

Patients often present with constitutional complaints including **malaise, fever, fatigue, weight loss and myalgias**. Most patients with the disease have an insidious onset. It may begin with systemic features, such as fever, malaise, arthralgias and weakness, before the appearance of joint inflammation and swelling.

JOINT FEATURES:

RA is typically a **distal, symmetrical, small joint polyarthritis** involving proximal interphalangeal and metacarpophalangeal joints of the hands, wrist, 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. In addition periarticular synovial structures such as bursae and tendon sheaths are commonly inflamed.

Most common symptoms described by patients are **pain and pronounced stiffness**. The later 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. **The affected joints are frequently tender, swollen and warm and there may be limitation of both active and passive movements**. Progressive destruction of the articular cartilage, subchondral bone and periarticular soft tissues eventually combine to produce the characteristic deformities seen in long standing RA.
UPPER LIMBS:

**Hands and wrists:**

Early in the disease there may be soft tissue swelling around the affected joints. Involvement of the proximal interphalangeal joints gives a **spindle shaped appearance to the fingers and soft tissue swelling** can be observed over the ulnar styloid and in the 2nd and 3rd metacarpophalangeal joints (MCP). **Tenosynovitis** of the long flexor tendons in the palm of the hand may exacerbate stiffness of the fingers and cause “Trigger finger”. Similar synovitis of the wrist within the flexor retinaculam may cause **compression of the median nerve with the typical features of Carpal Tunnel Syndrome**. Persistent synovitis with erosion of the articular surfaces, weakening of the joint capsules and muscle weakness, with or without tendon rupture will inevitably lead to deformities.

**Ulnar deviation and subluxation of the fingers:**

Occurs 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 flexor and extensor finger tendons.

**Swan Neck deformity:**

Develops from **hyper extension of the proximal interphalangeal joints** in conjunction with **flexion of distal interphalangeal joints** with subsequent contracture of the intrinsic muscles which become extensors rather than flexors of the proximal interphalangeal joints.

**Boutonniere (Button-Hole) deformity:**

Results from **flexion contractures of proximal interphalangeal joints associated with hyper extension of distal interphalangeal joints**. 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. The ulna can be depressed by pressure like a piano key.

**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. There may be inflammation of the subacromial bursae or supraspinatous tendon in addition to glenohumeral joint synovitis, producing a typical painful arc syndrome.

**LOWER LIMBS:**

**Feet and Ankles:**

Active synovitis of the metatarso phalangeal joints leads to spreading of forefoot. Subluxation of metatarsal heads into the soles results in cockup and valgus deformities causing painful walking and difficulty with foot wear. Pain arises in the ball of foot (metatarsalgia).

**Knee:**

Involvement of knee is an important cause of disability from an early stage of disease. Synovial proliferation is usually most obvious in the supra patella 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 (Baker’s cyst). Valgus deformity of the knee is usual consequence of loading.

**Hip:**

Involvement of hip is uncommon. Pain is usually present in the groin; buttock and abduction of hip are reduced ultimately leading to fixed flexion deformity of the joint.

**AXIAL SKELETON:**
Spinal involvement is limited to upper cervical articulation. Neck pain and stiffness are common and lead to erosion of bones and ligaments in cervical spine. Vertebral arteries may also be compressed resulting in vertebro basilar insufficiency with vertigo or syncope especially on downward gaze. The risk of cord compression is greatest in those with a subluxation exceeding 8mm and there is also vertical subluxation of the atlanto axial joint.

Symptoms suggestive of atlantoaxial disease include high cervical pain radiating to the occiput and temporal regions, exacerbated by neck movements.

- Brisk tendon jerk.
- Positive Hoffman sign.
- Upgoing plantar response.
- Loss of proprioception.
- Vibration sense indicates damage to posterior column.

**OTHER JOINTS:**

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

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![Image of Rheumatoid Arthritis](image-url)
EXTRA ARTICULAR FEATURES:

These tend to be more numerous and severe in those with high titers of rheumatoid factor in blood. Three major pathological phenomena dominate the disease.

- Inflammation of membranes
- Nodule formation
- Vasculitis.

A. RHEUMATOID NODULES:

Subcutaneous and intracutaneous nodules are the hallmark of the disease in ¼ of the patients. They are firm, non-tender swellings that occur on the extensor surface of the fore arm and olecranon sites, where repeated minor trauma could initiate their formation. They may also develop in many other tissues including eye (Scleromalacia), pleura, pericardium, parenchyma of lungs and heart.

B. HAEMATOLOGICAL MANIFESTATION:

Anaemia:

Moderate normochromic normocytic anaemia is a finding in active RA. Factors that are related to the inflammatory process probably contribute to this anaemia. There may be ineffective erythropoiesis and red blood cell survival is reduced. Iron binding capacity is typically reduced in active rheumatoid arthritis.

Thrombocytosis, Leukopenia is a finding in patients with Felty’s Syndrome.

Vasculitis:

Intimal hyperplasia of the small terminal digital vessels causes very limited cutaneous lesions (Nail fold infarcts, rashes, splinter haemorrhages). In contrast severe life threatening tissue infection may develop when there is involvement of large blood vessels by leucocytoclastic or necrotizing vasculitis.

C. LUNG INVOLVEMENT:

1. Pleurisy:
The fluid has more protein, low glucose; low complement levels and is typically positive for RA factor.

2. Nodules (Caplan syndrome):
   More in upper zone than lower zones. Cavitation may occasionally lead to haemoptysis.

3. Pulmonary fibrosis:
   It causes progressive dyspnoea, clubbing of fingers, fine late inspiratory crepitations.

4. Obliterative Bronchiolitis:
   Acute onset of breathlessness. Many patients have evidence of airway obstruction. Bronchiectasis also appears to be more common.

D. CARDIAC INVOLVEMENT:
   Pericardial effusion can be found by ultra-sonography in patients with seropositive nodular disease. Constrictive pericarditis is more common and presents with dyspnoea, right side heart failure and peripheral oedema.

   **Valvulitis:** Granulomatous thickening of the cusps of the aortic valve occurs more frequently than in the mitral valve, rarely producing incompetence.

E. EYE INVOLVEMENT:
   Common in RA and may be due to localized tissue involvement.

   **Episcleritis:**
   Appears as a raised lesion in the anterior sclera with hyperaemia of the deeper layers.

   **scleritis:**
   - Is less common and may lead to progressive thinning of the sclera (Scleromalacia) and even perforation.
   - Keratoconjunctivitis sicca (dry eyes) due to secondary Sjogren’s syndrome.
   - Corneal melting is a rare manifestation. Clinical features are pain, redness and blurred vision with corneal thinning.

F. PERIPHERAL NERVE INVOLVEMENT:
Peripheral neuropathies can be produced by proliferating synovium causing compression of nerves. A mild glove and stocking sensory neuropathy is relatively common in RA.

**G. MUSCLE INVOLVEMENT:**

Is attributed to the reflex inhibition and wasting resulting from severe joint pain.

**H. BONE INVOLVEMENT:**

Juxta-articular osteoporosis is an early feature. A small proportion of patients may develop osteomalacia.

**I. FELTY’S SYNDROME:**

Lymphadenopathy is common. It is more obvious in patients with Felty syndrome (Rheumatoid arthritis, Splenomegaly, Leucopenia). Other features include anaemia, thrombocytopenia, persistent vasculitic leg ulceration, cutaneous pigmentation, weight loss and recurrent infection.

**DIAGNOSIS:**

The American College of Rheumatology (1988 revised) developed the following criteria for the classification of rheumatoid arthritis.

1. **Morning Stiffness:** This occurs in and around the joints and lasts at least 1 hour before maximal improvement.

2. **Arthritis of 3 or more joint areas:** At least 3 joint areas simultaneously have soft tissue swelling or fluid (not bony overgrowth) observed by a physician.

3. **Arthritis of hand joints** of at least one area swollen in a wrist, MCP, or PIP joint.

4. **Symmetric arthritis** with simultaneous involvement of the same joint areas on both sides of the body. Bilateral involvement of PIPs, MCPs, and MTPs is acceptable without absolute symmetry.

5. **Rheumatoid nodules:** Subcutaneous nodules are present over bony prominences or extensor surfaces or in juxta-articular regions.

6. **Serum Rheumatoid Factor:** Abnormal amounts of serum RF are demonstrated by any method for which the result has been positive in fewer than 5% of healthy control subjects.
7. **Radiographic changes** typical of RA on posteroanterior hand and wrist radiographs, which must include erosions or unequivocal bony decalcification localized in or most marked adjacent to the involved joints. Osteoarthritic changes alone do not qualify.

A patient can be classified as having RA if 4 of 7 criteria are present. Criteria 1-4 must be present for at least 6 weeks, and a physician must observe criteria 2-5.

**COMPLICATIONS:**

RA is not fatal, but complications of the disease may shorten survival by a few years in some individuals. In general, RA is progressive and cannot be cured. In some, the disease gradually becomes less aggressive and symptoms may even improve. However, if bone and ligament destruction and any deformities have occurred, the effects are permanent. According to one survey, 70% of patients with RA believe that the disease prevents them from living a fully productive life.

**Lymphoma and other cancers:** Alterations in the immune system associated with RA may play a role in the higher risk for lymphoma observed in patients with RA. Aggressive treatments for RA that suppress the immune system may help preventing this cancer, but more research is needed to evaluate this possibility. Other cancers that may occur with increased frequency in patients with RA include prostate and lung cancers.

**Macrophage Activation Syndrome:** This is a life-threatening complication of RA and requires immediate treatment. Patients should be aware of symptoms, which include persistent fever, weakness, drowsiness, and lethargy.

**PROGNOSIS:**

The following factors at presentation are associated with a poor prognosis.

- Higher baseline disability.
- Female gender.
- Involvement of Metatarsophalangeal joints.
- Positive Rheumatoid Factor.
- Disease duration of over 3 months.
Disease that remains persistently acting for more than a year is likely to lead to joint deformities and disability around 80%.

INVESTIGATIONS:

No pathognomonic test is available to confirm the diagnosis of RA; instead, the diagnosis is made using clinical, laboratory, and imaging features.

HAEMATOLOGICAL:

1. Normochromic normocytic anaemia is frequently present in active RA.
2. The WBC count is usually normal, but a mild leucocytosis may be present.
3. Eosinophilia when present usually reflects severe systemic disease.
4. The Erythrocyte Sedimentation Rate is increased in nearly all patients with active RA.
5. The levels of acute phase reactants including Ceruloplasmin and C-reactive protein are also elevated.
6. Increased IgG, IgM, IgA and gamma globulin.

IMMUNOLOGICAL:

1. Rheumatoid factor (RF):

The presence of rheumatoid factor does not establish the diagnosis of RA, but can be of prognostic significance. RA factor are auto antibodies reactive with the Fc position of IgG. Presence of RF can be detected by several tests such as Rose Waaler, Latex fixation test and other slide agglutination test. The test can be employed to confirm a diagnosis in individuals with suggestive clinical presentation and if present in high titer, to designate patients at risk for severe systemic disease. Other conditions associated with RA are SLE, chronic liver disease, sarcoidosis, interstitial pulmonary fibrosis, hepatitis B, tuberculosis, syphilis and malaria.

2. Antinuclear antibodies: These are present in approximately 40% of patients with RA.
3. **Newer antibodies (anti-CCP):** Recent studies of antibodies to cyclic citrullinated peptide suggest a sensitivity and specificity equal to Rheumatoid factor.

**SYNOVIAL FLUID ANALYSIS:**
- Colour - Yellow
- Clarity - Cloudy
- Viscosity - Reduced
- Mucin clot - Poor
- WBC - > 3000 μL to 50000 μL
- Total protein - >3 gm.
- Microscopic feature - RA cell.
- Polymorpho nuclear leucocyte - >70.

**SYNOVIAL BIOPSY:**
Villus formation with thickening of synovial layer and infiltration with abnormal cells.

**RADIOGRAPHIC EVALUATION:**
- Diagnosis is supported by a characteristic pattern of abnormalities including tendency towards symmetric involvement.
- Soft tissue changes, juxto-articular osteoporosis may become apparent within weeks of onset.
- Loss of articular cartilage and bone erosion develop after months of sustained activities. Joint space changes, alignment, deformities, subluxation, bony ankylosis develops in the late stage.

**ARTHROSCOPY:**
In acute RA synovium is edematous, diffusely erythematous and friable. In more chronic condition it becomes thickened.

**MRI:** Used in patients with abnormalities of the cervical spine.

**SONOGRAPHY:**
This allows recognition of effusions in joints that are not easily accessible. High resolution ultrasound images may allow visualization of tendon sheaths, changes and degree of vascularization of the synovial membrane and even erosions.

**BONE SCANNING:**

Findings may help to distinguish inflammatory from non-inflammatory changes in patients with minimal swelling.

**DENSITOMETRY:** Findings are useful to diagnose changes in bone mineral density indicative of osteoporosis.

**OTHER TESTS:** HLA – DR4 may constitute a helpful marker in early undifferentiated arthritis.

**OTHER PROCEDURES:** Joint aspiration and biopsies (skin, nerve, rectum and kidney) maybe considered if vasculitis is suggested.

**DIFFERENTIAL DIAGNOSIS:**

1. Acute viral arthritis (Rubella, Hepatitis B, Parvovirus)
2. Bacterial endocarditis
3. Acute Rheumatic fever
4. Sarcoïdosis
5. Reactive arthritis (Reiter’s disease)
6. Psoriatic arthritis
7. Inflammatory bowel disease
8. Systemic Lupus Erythematous
9. Sjogren’s syndrome
10. Polymysitis
11. Vasculitis syndrome
12. Polyarticular gout
13. Calcium pyrophosphate disease
Origin of disease (Uthira Vatha Suronitham)

- Dietary Changes
- Seasonal Changes
- Stress like factors
- Genetic Changes
- Immunological Changes
- Socio economical factor
- Immoral Activities

Reflected on
- Soul – Mind – Body

- Anatomical Pathology
- Patho physiology
- Patho psychology

Affected seven
- affected three humors
- affected Trigunam

Udal Thathukkal

- Saaram → Vatham → Sathuva gunam
- Senneer → Pitham → Rajo gunam
- Oon → Kabham → Thamo gunam
- Kozhuppu
- Enbu
- Moolai
- Sukkilam / Suronitham

Disease

(Diagnosed by Envagai Thervugal)
Affected Three humors

**Vatham**
- Joint pain
- Joint Swelling
- Joint stiffness
- Restriction of movements
- Constipation.

**Pitham**
- Joint pain
- 1. Inflammatory Erosion of bony margin
- 2. Joint Swelling Changes in joints (Redness, Warmth)
- 3. Restriction of movements
- 4. Joint stiffness Changes in synovial fluid
- 5. Constipation.

**Kabham**
- Erosion of bony margin
- Restriction of movements
- Changes in synovial fluid

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**Abaanan** → Constipation.

**Viyanan** → Restriction of Movements.

**Samaanan** → Vitiation of Other Vayus and Loss of appetite.

**Kirukan** → Loss of appetite.

**Devathan** → Sleeplessness.

**Anal Pitham** → Loss of appetite

**Ranjaga Pitham** → Anaemia

**Prasaga Pitham** → Pallor of skin

**Saathaga Pitham** → Difficulty in Doing day to day activities

**Avalambagam** → Derangement of other kabha types

**Kilethagan** → Loss of appetite

**Santhigam** → Joint swelling Restriction of movements.
Affected Ezhu Udal Thathukkal

- Saaram: Loss of appetite
  - Senneer: Decrease in Udal Vanmai (Anaemia, increased ESR, positive RA factor)
  - Oon: Muscle wasting
  - Kozhuppu: Restriction of Movement
  - Enbu: Joint swelling, Bony erosion, Deformity

Diagnosis (Envagai Thervugal)

- Naa: Coated tongue
- Niram: Normal
- Mozhi: Constipation
- Vizhi: Vatha Pitham
- Malam: Pitha Vatham
- Moothiram: Pallor of skin (Anaemia)
- Naadi: Pallor of Conjunctiva
- Sparisam: Neerkuri

Neerkuri:
1. Normal
2. Disturbance in vision
   - Neikuri:
   1. Neikuri - Normal (Affected Joints)
   2. Neikuri - Snake like
   1. Swollen
      - Ring like, Pearl like
   2. Tender and Warmth.
STAGES OF PATHOGENESIS PROCESS

Principal target site - Synovium - Vasculitis (Increased vascularity, edema, congestion, villous hypertrophy)

- Fibrinoid degeneration / necrosis (Rice bodies)
  
  (Cornea, Pleura, Pericardium)

- Inflammatory cell infiltration (Lymphocytes, monocytes, macrophages, plasma cells)

- Fibroblastic proliferation (Pallisaded histiocytes)

  Rheumatoid granulation (“Pannus” invading connective tissue by creeping substitution)

- Capsule and ligaments

  - Edema

  - Laxity

  - Fibrosis

- Tendons and aponeurosis

  - Tendon synovial sheath infiltration

  - Pannus invasion of adjacent tendons

- Joints/articular cartilage

  - Pannus infiltration from synovial

  - Reflection into subchondral bone

- Subcutaneous tissues/bursae

  - Bursitis

  - Deprivation of nutrition

  - Nodules (Aschoff’s nodules)

- Edema

- Tendon synovial sheath infiltration

- Pannus invasion of adjacent tendons

- Avascularity and attrition

- Cellular death

- Attenuation or rupture

- Fragmentation of articular cartilage or erosion of plaques of devitalized cartilage

- Secondary deformity

- Total destruction of cartilage

- Ankylosis

- Disorganization of joint

Secondary dislocation or juxta-articular pathological fractures
RHEUMATOID ARTHRITIS
(JOINTS INVOLVED)
AUTO ANTIBODIES IN RHEUMATOID ARTHRITIS:

<table>
<thead>
<tr>
<th>Auto antibodies</th>
<th>Target</th>
<th>Possible pathogenic role</th>
<th>% positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rheumatoid factor</td>
<td>Self IgG</td>
<td>Generation of immune complex</td>
<td>70</td>
</tr>
<tr>
<td>Anti nuclear antibodies</td>
<td>Various nuclear components</td>
<td>Reaction with dead cells</td>
<td>4 - 6</td>
</tr>
<tr>
<td>Antihistones</td>
<td>Histones-I-IV</td>
<td>Vasculitis and uveitis</td>
<td>10 - 30</td>
</tr>
<tr>
<td>Anti ribinuclear protein</td>
<td>Ribonuclear proteins</td>
<td>Polyclonal b-cell activation</td>
<td>30</td>
</tr>
<tr>
<td>Antikeratin</td>
<td>Keratin</td>
<td>Disease severity</td>
<td>95</td>
</tr>
<tr>
<td>Anti cardiocipin</td>
<td>Diphosphate dyl glycerol</td>
<td>Effect on PGI2 release, platelet aggregation</td>
<td>10</td>
</tr>
<tr>
<td>Anti collagen</td>
<td>Type II collagen</td>
<td>Complement fixation joint</td>
<td>25</td>
</tr>
<tr>
<td>Antigliadin</td>
<td>Intestinal mucosa</td>
<td>Intestinal permeability to bacterial antigen triggers</td>
<td>25</td>
</tr>
</tbody>
</table>
Piniyari muraimai is a method of diagnosing a disease.

“Pini” means = Disease
“Ari” means = Identify
“Muraimiai” means = Method

This is based upon three main principles and Envagai Thervugal. The three main principles are,

- Poriyal arithal (Inspection)
- Pulanal arithal (Palpation)
- Vinathal (Interrogation)

Physicians ‘Pori’ and ‘Pulan’ are used as tools for examining the ‘Pori Pulan’ of the patient. The above principles correspond to the methodology of

- Inspection
- Palpation and
- Interrogation in modern medicine, in arrives a clinical diagnosis of the disease.

1. **Poriyal arithal (Inspection)**

   Pori is considered as the five senses of perception namely,
   1. Nose
   2. Tongue
   3. Eye
   4. Skin
   5. Ear

2. **Pulanal arithal (Palpation)**

   Pulan are functions of five senses. They are,
   1. Smell
   2. Taste
   3. Vision
   4. Sensation of Touch
5. **Hearing.**

Examinations of Pori and pulan of the patient by Pori and pulan of the physician.

3. **Vinathal (Interrogation)**

Vinathal is asking the information regarding the history of the disease, its clinical feature etc., from the patient or his close relatives who are taking care of him.

**அலற்கருக்கு தெளிவான காண்டுப்படைகள்:**

Alavaigal are used in clinical diagnose of a disease.

---

- Observation
- Inference
- Authority, literature
- Preception
- Presumption
- Comparison
- Inference by elimination
- Probability
- Tradition
- Natural Inference

The above mentioned “ten alavaigal” are included in three alavaigal. They are,
1. **Kaandal (Inspection by Siddha method):**
   Through ‘Kaandal’ the physician can directly see the patient, hear the patients all the complaints and at length concludes a diagnosis.

2. **Karuthal (Through Siddha Investigations)**
   Through Envagai thervu and Neerkuri as well as Neikuri, we can diagnose a disease by Karuthal.

3. **Urai (Literature evidence of Siddha)**
   Comparative study of the signs and symptoms of the patient with the reference books and come to a diagnosis.

**Ennvagai thervugal (Eight diagnostic tools)**

Siddhars have developed a unique method of diagnosing the disease by “Ennvagai thervugal”.

> “தாண்ப சுற்றியது கை நிழல் மீது கீழ்
உண்மை நன்றுவிதைய மறுக்கு மறுக்கு”
- செய்ய மகிழ்த உண்மையலை உண்மையலை மறுக்கு மறுக்கு.

**Hence the diagnosis is made by the following,**
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)

The specialty of eight tools of diagnosis is mentioned in the following verses also,

> ‘நந்துகிறது ஆண்டும் பார்த்து காண்கி
 கூறுகிறது பல்லுங்கி மேல் அணைத்து
பண்டைக்கு முற்றும் முற்றும் முற்றும்
பார்த்துகிற உண்மையல் உண்மையல் உண்மையல்.”
1. Naadi (Pulse):

The science of pulse forms a very important branch in the siddha system of medicine. Naadi is the seat anchor of energy. It is the binding force between soul and body. The pulse-waves as felt on the radial artery, one inch from the wrist by means of palpation with the tip of index, middle and ring finger corresponds to Vatham, Pitham and Kabham. They exist in the ratio of 1:1/2:1/4 normally. Derangement of this ratio leads to various disease entities.

In Udhiravatha Suronitham, Vatha pitha naadi, Pitha vatha naadi and Vatha kaba naadi are commonly seen.

2. Sparisam (Skin):

Skin examination can be made by inspection and palpation (touch). It reveals about the warmth/chillness, dry/weeping skin, rough/smooth, soft/hard, tenderness, presence of ulcers, fissures, swelling, wrinkles etc.

In Udhiravatha Suronitham, the affected part feels warm with redness, swelling, tenderness and subcutaneous nodules can be noticed.

3. Naa (Tongue examination):

The colour, character and condition of tongue change according to changes in mukkutram.

In Udhiravatha Suronitham, few cases had coated tongue. In few cases that were anaemic, the tongue was pale and some were have glossy.

4. Niram (Colour):

Signs of different complexions in Vatham, Pitham, Kabham and Thontha thegis, cyanosis, pallor, yellowish discolouration can be studied by means of niram.

In Udhiravatha Suronitham, the patient is of mixed complexion and the affected parts get swollen with hyperaemia.
5. Mozhi (Speech):

It constitutes high, low pitched voice, slurring and incoherent speech, nasal speech, hoarseness of voice etc.

In Udhiravatha Suronitham, the speech is normal in most of the patients. Only two patients had horseness of voice.

6. Vizhi (Eye):

Both motor and sensory disturbance of eye are noticed. Burning sensation, redness of eyes, paleness, excessive lacrimation, swelling, sunken eyes, corneal ulcers, other diseased conditions should be noted.

In Udhiravatha Suronitham, if the patient is anaemic, pallor of conjunctiva will be seen.

7. Malam (Stools):

Vatha type : Black coloured stools with constipation.
Pitha type : Loose stools with yellowish red colour.
Kabha type : White coloured stools with mucus.
Thontha type : Stools possess some of the features of two thodams.

In Udhira Vatha Suronitham, constipation is noted in few patients

8. Moothiram (Urine):

It includes Neerkuri and Neikuri.

Neerkuri:

- Niram - Indicates the colour of urine voided.
- Manan - Indicates the smell of urine voided.
- Edai - Indicates the specific gravity of urine voided.
- Nurai - Indicates the frothy nature of urine voided.
- Enjal - Indicates the quantity of urine voided.

In addition, the frequency of micturation and sedimentations are noted.

In Udhiravatha Suronitham, no abnormalities are seen in the above features.
Neikuri:

‘அதுல வாழும் அதித்யானம்
அப்படி அறியும் எந்தவும் காண்பது
அருகாமலே எடுக்க ஆகும்
முறை காட்டு காட்டிய நான் வழி
திணை பாதையே கொண்டு முடிய
பிளேடு போராடி முடியத்தில் கூட
னூறு போராடி முடியத்தில் கூட।
- முனைப்பை.

Prior to the day of urine examination, the patient was advised to take a balanced diet and the quantity of food must be proportionate to his appetite and he should have a good sleep.

After waking up in the morning, urine that is voided first is collected in a glass container and is subjected to analysis within one hour.

A drop of gingelly oil is added without disturbance and neikkuri is noted in direct sunlight.

Character of Vatha Neer:

‘அதுல பிளேடு வடிவம் பிளேடு வடிவம்.’

When the drop of oil lengths like a snake, it indicates ‘Vatha Neer’.

Character of Pitha neer:

“அறியும் பாதையும் அந்தப் பாதையும்.”

When the oil drop spreads like a ring, it indicates ‘Pitha Neer’.

Character of Kabha Neer:

‘அறியும் பாதையும் அதித்யானம் குளியும்.’

When the oil drop remains that of pearl, it indicates ‘Kabha Neer’.

Character of Thontha Neer:

Thontha neer appears as the combination of above patterns.
In Uthiravatha suronitham most of the patients had vatha neer and some of had kabha neer.

Besides Envagai thervugal, a disease can also be diagnosed by means other methods namely thinaigal, paruvakalangal, Udal thathukkal, Uyir thathukkal and Pori pulangal. A combination of all these diagnostic criteria is helpful to attain a proper diagnosis with complete entity based principles of siddha science.

**Thinai (Land and Place):**

The geographical distribution of land is classified into the five groups.

1. Kurinji - Mountain and its surroundings
2. Mullai - Forest and its adjacent areas
3. Marutham - Field and its surroundings
4. Neithal - Sea and its surroundings
5. Paalai - Desert and its surroundings.

Each region has its own characters, which influences the inhabitants, physical, mental, economical and occupational activities. In each region, some ailments are endemic based on the climatic features of that area.

In ‘Udhiravatha Suronitham’ most of the patients comes from Neithal nilam. Modification in lifestyle and food habits can also brings about the disease.

**Paruvakaalam (Seasonal Variations)**

The seasonal variation mainly depends upon the temperature, humidity, air and other climatic factors. The whole year is constituted by six seasons. They are,
<table>
<thead>
<tr>
<th>Season</th>
<th>Period</th>
<th>Pitham</th>
<th>Thannilai Valarchi</th>
<th>Pulippu Uppu</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Pinpani Kaalam (Masi – Panguni) (Feb16 – Apr15)</td>
<td>Kabam ↑</td>
<td>Thannilai Valarchi.</td>
<td>Enippu Pulippu Thuvarrpu</td>
</tr>
</tbody>
</table>

According to climatic condition that prevails in every season, changes will occur in the human beings which will modify the physiological state and makes them susceptible to certain specific disease likely to occur in that season.

Thus Vatham gets provoked from its normal state in its own location during “Muthuvaenir Kaalam”. This altered vatham spreads to other location in “Kaar Kaalam”. Altered Vatham subsides in “Koothir Kaalam”. The above three conditions are named as Thannilai Valarchi, Vetrunilai Valarchi and Thannilai Adaithal.

The incidence of Uthiravatha suronitham more in Kaarkalam and Koothir kaalam.

**MUKKUTRA VERUPADUGAL (SIDDHA PATHOLOGY)**
Which highlights that the main factor in the causation of the disease are vatham, pitham and kabham.

**VATHAM:**

Vatham is the prime force that impacts movement to every living cell in the body. Its dwelling place lies in the bones, muscles, nerves, joints etc. Hence it is responsible for the movement of parts involved in locomotor system. When vatham is affected, the other two pitham and kabham also gets deranged and in turn, they vitiates the other structural and functional elements of the living body called seven Udal thathus.

- **Viyaanan** which is responsible for the voluntary and involuntary movements and nutrition of the tissue gets affected leading to restriction of movements and lassitude.

- **Samaanan** which neutralizes other vitiated vayus gets affected. Further it is needed for normal digestion. So derangement of this vayu produces loss of appetite and indigestion.

- Involvement of Abaana Vayu also plays a main role in the manifestation of signs and symptoms. **Abaanan** which is responsible for distribution and assimilation of nutritional factors gets affected leading to symptoms like constipation.

- **Kirukaran** and **Thevathathan** are also affected because of loss of appetite and sleeplessness respectively.

**PITHAM:**
The main function of pitham which represents agni is thermogenesis or heat production, metabolism within its limits, process of digestion etc. Its vitiation produces inflammatory changes in joints. Among the five types of Pitham, the following four types get affected in Udhiravatha Suronitham.

- **Ranjaga pitham** which gives colour to blood.
- **Saathaga pitham** which is needed to carry out normal activities.
- In few, **Anal pitham** which is needed for digestion gets affected leading to anorexia.
- **Prasaga pitham** which gives complexion to skin gets affected leading to pallor of skin.

**KABAM:**

The deterioration of the two main kuttram accompany the Kabha kutram whose structure is Earth + Water and is concerned with the maintenance of smooth working of joints, integration of structural elements of the body into stable structures etc.

- **Santhiga kabham** which is needed for normal maintenance of synovial fluid gets affected.
- **Avalambagam** which forms the basis for all the other four types of Kabham gets affected.
- In few, **Kilethagam** gets affected leading to loss of appetite.

Thus disturbance in Mukkutram produces,

- Pain, swelling of joints, joint stiffness, restriction of movements, loss of appetite and sleeplessness and constipation due to vatham.
- Inflammatory changes in joints like redness, warmth, loss of appetite and anemia due to pitham.
- Erosion of bony margin, osteoporotic changes, increases in the synovial fluid are due to disturbed kabham.

**UDALTHATHUKKAL:**
Disturbances in vatham, pitham and kabham gets reflected on Udal thathus leading to change in normalcy of body or predisposition to causing disease. The seven udal thathus that supports the body in their state of equilibrium are as follows.

1. Saaram - Strengthens the body and mind.
2. Senneer - Gives power, knowledge and boldness to the mankind.
3. Oon - It gives structure and shape to the body and is responsible for movements of the body.
4. Kozhuppu - It lubricates the joints and organs and facilitates their functions.
5. Enbu - It protects all the internal organs and forms structural framework of the body.
6. Moolai - Resides inside the core of bones. It strengthens and maintains the normal condition of bones.
7. Sukkilam/ - Meant for reproduction (Male and Female Suronitham respectively).

In Uthiravatha suronitham, the affected Udal thathus are,

- Saaram - Loss of appetite, lassitude.
- Senneer - Anaemia, presence of RA factor).
- Oon - Muscle wasting, swelling.
- Kozhuppu - Emaciation, restriction of joint movements.
- Enbu - Vague pain and swelling of joints and deformity of joints.
LINE OF TREATMENT:

Siddha treatment is not only for complete healing but also prevention and rejuvenation. Saint Thiruvalluvar says about physician duty, study the disease, study the cause, treat subsiding way and do what is proper and effect.

“திருவள்ளுவர் சொன்னால் தருணத்தை வெளிப்படுத்துவதற்கும்
விளங்கையும் விளையாட்டும் வேண்டும்.
எண்டிய ரோஜா பாறைத்தலாமா தன்மையும்
அழிவான் கோசிக்க விளையும்.”
- திருவள்ளுவர்.

So it is essential to know the disease, the etiology, the nature of patients, severity of the illness, the seasons and the time of occurrence must be observed clearly.

Line of treatment is as follows.

- Kaappu (Prevention)
- Neekkam (Treatment)
- Niraivu (Restoration).

1. KAAPPU (Prevention):

“The curse causeless shall not come” is a proverb. Knowing the cause there by removing it and thus preventing the disease is the main aim of siddha system of medicine.

Thiruvalluvar depicted,

‘அருணாரை காளணால் பக்காகவைக் காண்கிறாய்
அம்மை மேற்புற அம்மையோள்.’

This Kural highlights that no medicine is required by the body if food is taken on complete digestion on what was taken before. Thus change in food habits plays a main role in the causation of diseases

Further, following of Theraiyar Pini Anugaa Vidhi will help in the prevention of diseases. The main highlights of Theraiyar Pini Anugaa Vidhi are as follows.
2. NEEKKAM (Treatment):

In siddha system the main aim of Pini Neekam is based on the following objectives.

- Accurate diagnosis is essential for the early application of appropriate forms of therapy.
- To bring the three thodams to equilibrium.
- Treatment of the disease and its symptoms by internal medicines, topical application of medicated oil (Thokkanam), fomentation (Otradam) in affected region.
- To built up seven body constituents
- Diet and prevention of disease.
- To increase natural immunity.
- Education of patient in maintaining the joint stability by means of Yogasanas.

Vatha diseases can be brought down by ‘Viraesanam’. For this laxatives and purgatives are given according to patient’s tolerance to drug. All the patients were given Merugulli thylam at a dose
of 10ml with warm water on the first day in the early morning. They were put in diet allowing only taking butter milk.

“The main point is that the administration of

‘

Ntu;ghU jioghU kpQ;rpdf;fhy;

The disease Uthiravatha suronitham involving multiple system of the body especially musculoskeletal system affected first and then other systems are affected depends upon their immunology. Single and herbal drug therapies are not much useful to cure the disease. Herbomineral drug only can give remarkable improvement in this disease.

3. NIRAIVU: (RESTORATION)

Reassurance of disease recovery was given to all patients. All the patients were advised to live in good health free from disease.

Diet:

“பங்குகிறது ந ஆணு ந ஆணை பங்குகிறது”

- கிருஷ்ணன்

“பங்குகிறது ந ஆணு ந ஆணை பங்குகிறது போன்றவர்களால்

உங்கள் நூற்றாண்டு புரிகும்”

- கிருஷ்ணன்

அந்நியரால் ந ஆணு ந ஆணை பங்குகிறது காலம் நாய்கத்து நோக்கும். காற்றுகே நாய்கத்து காலம் நோக்கும். காற்றுகே நாய்கத்து காலம் நோக்கும் காலமாக நோக்கும்.

Anupaanam:

In siddha system of medicine the adjuvant is one of the most important thing during therapy.

“அணுபானாக்கிறது பங்குகிறது பங்குகிறது

உந்தியது காே காலம் தந்தை - கிளை பூகான்

காலம் நோக்கும் மறுவிப்பான் நோக்கும் நோக்கும் தான் ஆயிரத்தாக்கே நோக்கும்

- கிருஷ்ணன்.
Pathiyam:

“Take anything you like” – siddha system does not believe in this dictum. The system of arranging dietary with certain restrictions in diet and physical activities is Pathiyam. Pathiyam for vatha disease as mentioned as Patharthaguna chinthamani is as follows,

Njhilj; Njd;kpsF ey;nyz;nza;
jq;F ngUq; fhak; jOjhio vq;nfq;Fk;
$l;LrpW Kj;J new; Nfhjpy; cSe;jpitfs;
thl;L kdpyj;ij kjp||
Nrh;f;fj;jf;fd:
nrq;fOePh; fpoq;F> Njd;> kpsF> Nfhl;lk;> vs;nea;> nea;> cSe;J> ngUq;fhak;>
jOjhio.

ePf;f Ntz;bait:
cg;G
Gspg;G> Jth;g;G> RitAs;s nghUs;fs;.

MANAGEMENT OF UTHIRAVATHA SURONITHAM:

THOKKANAM, OTRADAM:

Thokkanam is topical application of medicated oil. It is the systematic and scientific manipulation of body tissues, best performed by hands. Ottradam is fomentation and is done with the use of herbs etc.

Both of which produces pain relief and increases the blood flow owing to arteriolar and capillary dilatation and reduces joint stiffness. They increase the extensibility of collagen tissues so that contractures can be stretched.

YOGA:

Yogasanas are specialized postures of the body and helps in the development of an inner awareness and results in deep relaxing and energy conservation. Prescription of these asanas which is synchronized with breathing helps in the correction of impairment there by improving the musculo-skeletal function and maintaining the state of well being.
Udhiravatha Suronitham patients were advised to perform,

1. **Savasanam**, two times daily for a session of 10 minutes.
   
   *Sava* means dead body. Should lie motionless on the floor in supine Posture like dead body with a view to secure complete relaxation of all parts of the body and removing stress.

2. **Deep relaxation techniques once daily for a period of 20 minutes.**
   
   Further the patients were advised to do Pranayamam in association with Mudras.

   - Naadi Sudhi (Using Nasika Mudra)
   - Abdominal Breathing (Using Cin Mudra)
   - Thoracic Breathing (Using Cinmaya Mudra)
   - Full Yogic Breathing (Using Brahma Mudra)

   Practice of this pranayama relieves stress, tension, anxiety and insomnia there by bringing stability to mind. **The Mudras preserves the joint movements of fingers.**

3. **NIRAIVU (Life style modification):**

   Self help techniques were advised to keep inflammatory process at a minimum, there by preserving joint motion.

   **Self management techniques:**

   - Rest - reduces the general activities there by avoiding straining of joints and to conserve the quota of vitality.
   - Positive mental attitude.
   - Use of joint – Patient is told, the value of correct posture and methods of using the joints wisely to reduce stress on the painful joints.
   - An assistive device – Like splints, walking sticks provides strength and reduces pain and inflammation.
   - Adequate sleep.
   - Relaxation techniques.
Modification in daily activities like avoiding walking on hard and uneven surfaces, avoiding squatting on ground, etc.

PHYSICAL THERAPY:

Physiotherapy is the application of physical agents and principles to pathological conditions for the purpose of producing therapeutic effects.

Physiotherapy includes:

- Active exercise
- Passive joint movement
- Local heat
- Massage
- Electrical stimulation of muscle
- Light therapy – UV rays therapy and infra red ray’s therapy.

DETAILS OF RANGE OF MOTION EXERCISE:

I. UPPER EXTREMITIES:

A. Neck:

1. In sitting position twist your head as possible in each direction.
2. Sit or stand with your hands on the hips. First circle the head clockwise then counter clockwise.
3. In the sitting position try to touch shoulder with your head.
4. In the sitting position look behind as far as possible and then look at your toes.

B. Shoulder:

1. Arms at side with elbow straight bring arms forward and upward by ear.
2. Arms at side with elbow straight take arms sideward and upward.
3. Arms at side bend elbow to right angle and take hands apart.

C. Elbow:

1. Bend elbow, touching fingers to top of shoulder.
2. Straighten elbow.
D. Forearm:

Elbow bend, turn palm of the hand and then back of the hand towards face.

E. Wrist:

1. Keeping forearm steady, move the wrist up and down as in waving.
2. Again hold forearm steady, move the wrist up and down as in hand shaking.
3. Make circle with hand.

F. Hand and Fingers:

1. Make tight first.
2. Open fingers as wide as possible.
3. With the hand open spread fingers away from each other and then together.
4. Touch tip of the thumb to the tip of the each fingers.
5. Bend the thumb in toward palms of the hand.

II. LOWER EXTREMITIES:

A. Knee:

Sit with your feet off the floor. Lift the leg and then allow it to return to the bent position slowly.

B. Ankle:

1. Pull foot up and in, and then push back downward.
2. Make circle with foot.
3. Pull foot in toward other foot.
4. Pull foot to outside.

C. Toes:

Pull up on toes then curl toes under.

Exercise benefits for individuals with arthritis:
- Helps to preserve muscle strength and normal mobility of joints.
- Relieves of pain and stiffness.
- Prevent further deformities.
- Improves co-ordination.
- Return to normal independent life style.
HAND EXERCISES

A. Active range of motion

B. Wrist stretch

C. Tendon glides

Wrist flexion exercise

Wrist extension exercise

Grip strengthening
EXERCISES
CERVICAL COLUMN

1
Method
- Sitting straight up, bend the head first to the left and then towards the right, keeping the gaze fixed straight ahead during the exercise.

2
Method
- Bend the head and let it fall forwards till the chin touches the chest, and then slowly bend the head back as far as it goes.

ELBOW JOINT

1
Method
- Raise arms vertically, then slowly cross them so that the right hand touches the left shoulder and the left hand touches the right shoulder.
- Bring arms back to a vertical position and revert to starting position.

2
Method
- While inhaling, press the elbows against the floor, then relax the arms by releasing the pressure while exhaling.

SHOULDER JOINT

Starting position
Sitting upon a stool, with hands joined across the chest.

Method
- Turn palms away from the body, with the backs of the hands facing the chest, extend the arms forwards and then revert to starting position by performing the same movements in an inverse direction.
EXERCISES FOR WRIST AND FINGERS

1. Method
   - Raise the hands without moving the forearms.

2. Method
   - Sitting at the table with the hand over the edge. Bend and extend the hand from the wrist.
   - Continue the same exercise by holding a maximum weight of 2 kg in each hand.

3. Method
   - Move the hands along the table from side to side from the wrist, without moving the forearms.
   - Carry out the same exercise, raising hands from the table, wrist upwards, making a semi-circular movement.

4. Method
   - Rotate the forearm, making the palm face upwards, and then repeat the movement in the inverse direction, palm facing the floor.
   - Continue the same exercise alternately with a weight in each hand, preferably holding an empty bottle.

5. Method
   - Rotate the hand in a circular motion in both directions.
   - Continue the exercise alternately by holding in each hand a weight not exceeding 2 kg.

6. Method
   - Spread the fingers and thumb, separating each one.
EXERCISES FOR WRIST AND FINGERS

Method
- Bend the arms at the elbows, bringing forearms up, open and close fists, revert to starting position.

Method
- Bring the tips of the index and middle finger together, repeat with each one of the fingers, extending the fingers between each movement.

Method
- Rotate the forearms so that the fingers face the chest. Slowly stretch the arms forwards at shoulder level, keeping the palms together, revert to starting position by making the same movements in the inverse direction.

Method
- Without separating the palms, clench the fingers first towards the floor and then towards the chest.

Method
- Bend downwards, letting the chest touch the table, straighten the arms and then repeat the movement again.

Practical Exercises
- Open and close a water-tap or a window, turn a key into a keyhole, button and unbutton a garment, knot a lasso, operate a switch, open and close a door, screw and unscrew a screw, pick up match sticks or needles and do writing exercises.
MATERIALS AND METHODS
MATERIALS AND METHODS

ABOUT THE DISEASE:

a) According to siddha aspect:

In siddha literature the clinical features of Uthiravatha suronitham according to yugi Vaithya chinthamani is given below,

B) In Modern medicine, clinical features of Rheumatoid arthritis are:

1. Arthritis of three or more joints including major joints and minor joints.
2. Arthritis of hand joints – Interphalangeal joints of both hands and feet.
3. Morning stiffness > 1 hr.
4. Symmetrical arthritis.
5. Fever.
6. Anemia.
7. Anorexia.
8. Spindled appearance of fingers.
9. Rheumatoid nodules.

IV SAMPLE:
Patients of Uthiravatha suronitham reporting at OPD – Ayothidoss Pandithar Hospital in National institute of siddha, Tamaram sanatorium, Chennai-47.

**SAMPLE SIZE:**

The trial size will be 40 patients. (20 In patients and 20 Out patients)

**STUDY DESIGN:**

Clinical trial of cases of Uthiravatha suronitham (Rheumatoid arthritis) by Rasapralaya chenturam (Internal) and Navanatha siddhar thylam (External application) for a period of 20 days.

**V INCLUSION CRITERIA:**

- Age between 25 to 55 years.
- Sex: Both Male and Female.
- Arthritis of three or more joints.
- Symmetrical joint involvement.
- Morning stiffness.
- Positive serum rheumatoid factor.
- Anemia
- Fever
- Anorexia
- Spindled shaped appearance of fingers.
- Rheumatoid nodules.

**VI EXCLUSION CRITERIA:**

- Cardiac disease.
- Hypertension
- Diabetes mellitus.
- Use of narcotic drugs.
- Pregnancy and lactation.
- Other joint disease.
- History of trauma.
Neurological disorder.

VII TERMINATION CRITERIA:

- Development of any adverse drug reaction.
- Occurrence of any serious illness.

VIII TRIAL DRUG AND DURATION:

1. Purgation - Merugulli thylam - 10 ml in the morning with hot water (first day of treatment only)
2. Internal medicine - Rasapralaya chenthuram 100 mg with Thirikadugu choornam 1 gm with the adjuvant of honey, twice a day after food.
3. External medicine - Navanatha siddhar thylam 10ml local application twice a day.
4. Trial period – 20 days for each patient.

IX STUDY PERIOD: 90 days.

RECRUITMENT:

As and when patients reporting in Ayothisso Pandithar Hospital of National Institute of Siddha, satisfying inclusion and exclusion criteria will be eligible for admission to the trail. They will be included in the study with the approval of Head of the Department. Informed consent will be obtained from the patients before entering into the study.

IX TESTS AND ASSESSMENTS:

A. Clinical Assessment Proforma:

B. Routine investigations:

- Blood – TC, DC, ESR, Hb, Blood sugar, Serum cholesterol.
- Kidney function test - Urea, Creatinine.
- Liver function tests – Serum total Bilirubin, Direct Bilirubin, Indirect Bilirubin, Alkaline phosphates, SGOT, SGPT.

C. Specific investigations:
CRP, RA factor, ASO titre.

D. Urine:
Urine sugar, Albumin, Deposits.

E. Stool:
Ova, Cyst, Occult blood.

X ASSESSMENT BY SIDDHA ASPECTS:
Envagaithervugal and Mukkutra assessment.

SIDDHA ASPECTS (According to yugi vaithya chinthamani):

- Pain and swelling in major joints and minor joints.
- Pain in heels.
- Pain in Interphalangeal joints (hand joints)
- Fever.
- Burning sensation.
- Anorexia

X METHODOLOGY OF TREATMENT:

Rheumatoid arthritis patients satisfying inclusion and exclusion criteria will be eligible for the admission to the trial. Informed consent will be obtained from the patient. Lab test will be carried out before treatment.

A day before to starting the trial drug treatment, purgation will be given to correct the elevated mukkurams. The next day onwards the trail drug will be given to the in patients. For In patients, the trial drug will be given daily by the doctor. The clinical assessment will be made daily and laboratory investigations will be done on the first day and 21st day of the treatment.

For out patients, the trail drugs will be given in the Out patients Department of our Hospital. The patients will be asked to follow regular check up in the Op Department once in 7 days regularly. In
each visit, the clinical assessment will be reported regularly by researchers prescribed proforma. The laboratory investigations will be done before and after treatment and recorded in the prescribed format.

XI DATA COLLECTION FORMS:
Required information will be collected each patients by using forms I, II.

- Form I - Selection proforma – Used at the time of admission of the patient to the study.
- Form II - Assessment proforma - Used after the study period.
- Form III – Daily progress chart – Used during the study period.

XII STATISTICAL ANALYSIS:
- R.A. Scale for measurement of pain.
- Mean of objective parameters – before and after treatment- paired t test.
- Multivariate analysis will also be performed if applicable.

UNIVERSAL PAIN ASSESSMENTS SCALE:

- No pain
  - Patient can able to do day to day life.
- Mild pain
  - Patient can able to tolerate pain and also able to work.
- Moderate pain
  - Patient can able to work but pain more interference with concentration.
- Severe pain
  - Difficulty to do basis needs.

GRADATION OF RESTRICTED MOVEMENTS:

- G I – Able to perform normal duties.
- G II – Moderate Restiction – Self care is possible.
- G IV – Confirmed to bed or Wheel chair.
Mr. DEVA  32/M

SWAN NECK DEFORMITY WITH ULNAR DEVIATION OF FINGERS

HALLUS VALGUS WITH CROWDING OF TOES
MRS. MUNIYAMMA 36/F

RHEUMATOID NODULES

X - RAY CHANGES
Mrs. Muniyamma 36 / F

BOUTONNIERE DEFORMITY, Z DEFORMITY OF RIGHT HAND

HALLUS VALGUS WITH HAMMER TOES & OVERLAPPING OF TOES
OBSERVATION
AND
RESULTS
OBSERVATION AND RESULTS

Results were observed with respect to the following criteria.

1. Sex distribution.
2. Age distribution.
3. Thinai.
4. Paruvakaalam.
5. Occupation.
6. Diet reference
7. Socio-economic status.
8. Etiological factor.
10. Duration of illness.
11. Clinical manifestations.
12. Systemic examination.
13. Individual joint involvement.
15. Grading of restricted movements.
17. Involvement of Udhal thathukal.
18. Envagaithervugal.
19. Results.
1. Sex Distribution:

Table – 1. Illustrates sex distribution and its relative percentage.

<table>
<thead>
<tr>
<th>SI. No.</th>
<th>Sex</th>
<th>In - Patients</th>
<th>Out - Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>Male</td>
<td>6</td>
<td>30 %</td>
</tr>
<tr>
<td>2</td>
<td>Female</td>
<td>14</td>
<td>70 %</td>
</tr>
</tbody>
</table>

From the above table, it is clear that the incidence is more in females.

2. Age Distribution:

Table - 2 illustrates age distribution and its relative percentage:

<table>
<thead>
<tr>
<th>S.NO</th>
<th>AGE</th>
<th>IN PATIENTS</th>
<th>OUT PATIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.ofcases</td>
<td>Percentage</td>
</tr>
<tr>
<td>1.</td>
<td>25 - 35</td>
<td>6</td>
<td>30 %</td>
</tr>
<tr>
<td>2.</td>
<td>36 - 45</td>
<td>6</td>
<td>30 %</td>
</tr>
<tr>
<td>3.</td>
<td>46 - 55</td>
<td>8</td>
<td>40 %</td>
</tr>
</tbody>
</table>
The above table shows that the incidence is more in 4th, 5th decades.

Out of 20 In-patients, 30% of the cases were in Vatha Kaalam, 70% of cases were in Pitha Kaalam. Out of 20 Out-patients, 30% of the cases were in Vatha Kaalam, 70 % of cases were in Pitha kaalam. **This shows that majority of the cases were affected in Pitha Kaalam.**

![Graph showing age distribution]

### 4. Thinai:

**Table - 3. Illustrates the distribution with respect to Thinai:**

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Thinai</th>
<th>In - Patients</th>
<th>Out - Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>Kurinji</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Mullai</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Marutham</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>Neithal</td>
<td>17</td>
<td>85</td>
</tr>
<tr>
<td>5</td>
<td>Paalai</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

The above table shows, most of the patients were **from Neithal Nilam**.
4. Paruva Kaalam:

Table– 4. Illustrates the incidence of the disease with respect to Kaalam:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Paruva Kaalam</th>
<th>Out - Patients</th>
<th>In - Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>Kaar kaalam</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>Koothir kaalam</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>Munpani kaalam</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>Pinpani kaalam</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Elavenir kaalam</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Mudhuvenir kaalam</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

From the above table it is clear that majority of patients were **admitted in Kaarkalam and Koothir kaalam** and some of cases in Munpani kaalam.
5. Occupational status:

Since occupational history is closely relates with the exacerbation of the existing condition.

Table - 5 illustrates the Occupational status:

<table>
<thead>
<tr>
<th>SI.NO</th>
<th>Occupation</th>
<th>No. of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Non workers</td>
<td>13</td>
<td>32.5</td>
</tr>
<tr>
<td>2.</td>
<td>Office workers</td>
<td>7</td>
<td>17.5</td>
</tr>
<tr>
<td>3.</td>
<td>Teachers</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>4.</td>
<td>Coolies</td>
<td>18</td>
<td>45</td>
</tr>
<tr>
<td>5.</td>
<td>Total</td>
<td>40</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Out of 40 patients 45 % of cases are coolies, 32.5 % of cases are Non workers and 17.5 % are Office workers.

6. Diet reference:

Table –6. illustrates the Diet:

<table>
<thead>
<tr>
<th>SI.NO</th>
<th>Food habits</th>
<th>No. of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Vegetarian</td>
<td>2</td>
<td>5 %</td>
</tr>
<tr>
<td>2.</td>
<td>Non vegetarian</td>
<td>38</td>
<td>95 %</td>
</tr>
<tr>
<td>3.</td>
<td>Total</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>
Among 40 cases 95 % of the cases are non vegetarian and 5 % of the cases are vegetarian. It indicates non vegetarian diet may prone or aggravate this disease.

7. Socio-Economic status:

Table – 7. Illustrates the Socio-Economic status.

<table>
<thead>
<tr>
<th>SI. No</th>
<th>Socio-Economical Status</th>
<th>No. of Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>High</td>
<td>6</td>
<td>15 %</td>
</tr>
<tr>
<td>2.</td>
<td>Middle</td>
<td>14</td>
<td>35 %</td>
</tr>
<tr>
<td>3.</td>
<td>Poor</td>
<td>20</td>
<td>50 %</td>
</tr>
</tbody>
</table>

The above table shows, most of the patients affected by this disease belongs to Poor Socio-Economic status.
8. Mode of Onset:

Table 8. Illustrates the Mode of onset:

<table>
<thead>
<tr>
<th>S.NO</th>
<th>Mode of onset</th>
<th>In patients</th>
<th>Out patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No of cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>Acute</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Gradual</td>
<td>19</td>
<td>95</td>
</tr>
</tbody>
</table>

Above table shows most of the cases had gradual onset.
9. Duration of Illness:

Table – 9. Illustrates the Duration of Illness.

<table>
<thead>
<tr>
<th>SI. No.</th>
<th>Duration of Illness</th>
<th>No. of Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Below 3 month</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td>2</td>
<td>3 - 6 months</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>6 - 12 months</td>
<td>11</td>
<td>27.5</td>
</tr>
<tr>
<td>4</td>
<td>1 – 2 yr</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>2 – 3 yr</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>6</td>
<td>3 – 5 yr</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>7.</td>
<td>More than 5 yr</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>8.</td>
<td>Total</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

From the table it is clear that **most of the cases were affected in the duration of 6 - 12 months.**
10. Clinical Manifestations:

Table – 10. Illustrates the Symptoms of the Disease.

<table>
<thead>
<tr>
<th>S.no</th>
<th>Symptom</th>
<th>Before treatment</th>
<th>After treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No of cases</td>
<td>Perc %</td>
</tr>
<tr>
<td>1</td>
<td>Joint pain</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Major jt swelling</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Minor jt swelling</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Restricted movement</td>
<td>24</td>
<td>60</td>
</tr>
<tr>
<td>5</td>
<td>Morning stiffness</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>Sleeplessness</td>
<td>30</td>
<td>75</td>
</tr>
<tr>
<td>7</td>
<td>Loss of appetite</td>
<td>23</td>
<td>57.5</td>
</tr>
</tbody>
</table>

Among the 40 cases, before the treatment all the cases had joint pain, major and minor joint swelling. 60 % of the case had restricted movement, 75 % of the cases had sleeplessness and 57.5 % of cases had loss of appetite.

**After the treatment**

- Joint pain relieved in 27.5 % of cases and reduced in 70% of cases.
- Major joint swelling relieved in 12.5 % of cases and reduced in 87.5 % of cases.
- Minor joint swelling relieved in 30 % of cases and reduced in 70 % of cases.
- Restricted movement relieved i 16.6 % of the cases and reduced in 83.3 % of cases.
- Morning stiffness relieved in 15 % of cases and reduced in 85 % of cases.
Sleeplessness relieved in 10% of cases and reduced in 65% of cases.

Loss of appetite relieved in 17.5% of cases and reduces in 40% of cases.

11. Systemic Examination (Extra articular features):

Table – 11. Illustrates the signs of Systemic Examination.

<table>
<thead>
<tr>
<th>SI. No</th>
<th>Signs</th>
<th>In - Patients</th>
<th>Out - Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>Subcutaneous nodules</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Muscle wasting</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Respiratory system (Breathlessness)</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Horseness of voice</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Nervous system (Peripheral neuritis)</td>
<td>3</td>
<td>15</td>
</tr>
</tbody>
</table>

Out of 20 In-Patients, 20% of the cases had subcutaneous nodules, 20% of the cases had muscle wasting, 15% of the cases had peripheral neuritis and 25% of the cases had breathlessness.

Out of 20 Out-Patients 15% of the cases had muscle wasting, 10% of the cases had central nervous system involvement, 10% of the cases had horseness of voice and 15% of the cases had breathlessness.
12. Individual joints involvement:

Table – 12. Illustrates the incidence of individual joints involvement.

<table>
<thead>
<tr>
<th>SI. No.</th>
<th>Joints involved</th>
<th>In - Patients</th>
<th>Out - Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>Proximal inter phalangeal Joints</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Metacarpo-phalangeal Joints</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Wrist Joint</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Elbow Joint</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>5</td>
<td>Shoulder Joint</td>
<td>9</td>
<td>45</td>
</tr>
<tr>
<td>6</td>
<td>Temporomandibular Joint</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>Cervical spine</td>
<td>9</td>
<td>45</td>
</tr>
<tr>
<td>9</td>
<td>Lumbar spine</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>10</td>
<td>Hip Joint</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>Knee Joint</td>
<td>18</td>
<td>90</td>
</tr>
<tr>
<td>12</td>
<td>Ankle Joint</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>13</td>
<td>Meta-tarso phalangeal Joints</td>
<td>12</td>
<td>60</td>
</tr>
</tbody>
</table>

From the above table it is clear that in all the patients’ proximal interphalangeal joints, metacarpo-phalangeal joints, wrist joint, ankle joint and knee joint gets more affected.
13. Deformity of Joints:

Table – 13 illustrates the distribution with respect to Deformity of Joints.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Deformity</th>
<th>In-Patients</th>
<th>Out-Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No of cases</td>
<td>Percentage</td>
<td>No of cases</td>
</tr>
<tr>
<td>1</td>
<td>Swan neck deformity</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Z shaped thumb</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Ulnar deviation of fingers</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>Ulnar deviation of toes</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>Hallus valgus</td>
<td>2</td>
<td>10</td>
</tr>
</tbody>
</table>

From the table it is clear that in both Out-Patients and In-Patients 7.5% of the cases had foot deformity, Swan neck deformity was seen in 10% of cases, Z shaped thumb was seen in 10% of cases, ulnar deviation of fingers was seen in 10% of Out-patients, Hallus valgus seen in 10% of cases.


Table – 14. Illustrates the Grades of Pain in before and after to the treatment:

<table>
<thead>
<tr>
<th>S.NO</th>
<th>PAIN</th>
<th>Before treatment</th>
<th>After treatment (No of Cases)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No of cases</td>
<td>Relieved</td>
</tr>
<tr>
<td>1</td>
<td>Mild</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>Moderate</td>
<td>18</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Severe</td>
<td>11</td>
<td>-</td>
</tr>
</tbody>
</table>
From the above table,

Before the treatment 11 cases had mild pain, after the treatment pain relieved in 8 cases, reduced in 3 cases.

Before the treatment 18 cases had moderate pain, Out of this after the treatment pain relieved in 2 cases, reduced in 10 cases and moderate pain still persist in 6 cases.

Severe pain in 11 cases, after this treatment pain reduced in 7 cases and in 4 cases no changes occur.

15. Grading of Restricted movements:

Table – 15. Illustrates the Grading of Restricted movements.

<table>
<thead>
<tr>
<th>SI. No</th>
<th>Grading of rheumatoid arthritis</th>
<th>In - Patients</th>
<th>Out - Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>I – no restriction in normal activities</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>II – moderate restriction</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>III – marked restriction</td>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td>4</td>
<td>IV – confined to bed</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

Most of the cases come under moderate and marked restriction.

16 Disturbances in Mukkutram:

Table – 16. Illustrates the disturbances in Mukkutram.

a. Disturbances in Vatham:

<table>
<thead>
<tr>
<th>SI. No</th>
<th>Vatham</th>
<th>In - Patients</th>
<th>Out - Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>Praanan</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>Abaanan</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td>3</td>
<td>Viyaanan</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Udhaanan</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
In all the cases Viyaanan, Samaanan gets affected due to pain, restricted movements and difficulty to perform locomotive action. Devathathan affected in most of the cases due to sleeplessness and Abaanan were affected in some of the cases due to constipation. Pranan also affected in some cases due to breathlessness Uthanan affected in 10% of out patients due to horseness of voice.

b. Disturbances in Pitham:

<table>
<thead>
<tr>
<th>SI. No</th>
<th>Pitham</th>
<th>In - Patients</th>
<th>Out - Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>Anal pitham</td>
<td>17</td>
<td>85</td>
</tr>
<tr>
<td>2</td>
<td>Ranjaga pitham</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Prasaga pitham</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Alosaga pitham</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>Saathaga pitham</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

All the cases get affected with Sathaga pitham and Ranjaga pitham, anal pitham affected due to loss of appetite Prasagam affected in some cases due to heat presents over the joints.
c. Disturbances in Kabham:

<table>
<thead>
<tr>
<th>SI. No</th>
<th>Kabham</th>
<th>In - Patients</th>
<th>Out - Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
<td>No. of Cases</td>
</tr>
<tr>
<td>1</td>
<td>Avalambagam</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Kilethagam</td>
<td>17</td>
<td>85</td>
</tr>
<tr>
<td>3</td>
<td>Pothagam</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Tharpagam</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>Santhigam</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

Table shows that all the cases get affected with Avalambagam, Kilethagam and Santhigam due to pain, swelling, restricted movement and deformity over the joints. Kilethagam affected due to loss of appetite. Tharpagam affected in some cases due to impaired vision.

17. Involvement of Udal Thathukkal:

Table – 17. Illustrates the Involvement of Seven Udal Thathukkal.

<table>
<thead>
<tr>
<th>SI. No</th>
<th>Udal thathukkal</th>
<th>In - Patients</th>
<th>Out - Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
<td>No. of Cases</td>
</tr>
<tr>
<td>1</td>
<td>Saaram</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Senneer</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Oon</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Kozhuppu</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>Enbu</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>Moolai</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Sukkilam/Suronitham</td>
<td>4</td>
<td>20</td>
</tr>
</tbody>
</table>
Table shows, in all the cases Saaram, Senneer, Oon, Kozhuppu and Enbu gets affected. Suronitham affected in some cases due to menstrual irregularity.

Saaram affected due to general debility of the patients, Senneer affected due to ESR, Hb, RA factor & CRP variations, Oon affected due to swelling and muscle wasting. Kozhuppu affected due to restricted movements. Enbu affected due to deformity and pain over the joints.

18. Envagai Thervugal:

Table – 18. Illustrates the condition seen in Envagai Thervugal.

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Envagai thervugal</th>
<th>In - Patients</th>
<th>Out - Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>Naa</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Pallor of the tongue</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coated tongue</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>Niram</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Mozhi</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Vizhi</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pallor</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Impaired vision</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>Malam</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td>6</td>
<td>Moothiram Neikuri</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vatha neer</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Pitha neer</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Kaba neer</td>
<td>9</td>
<td>45</td>
</tr>
<tr>
<td>7</td>
<td>Sparisam</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>
Sparisam gets affected in all the patients due to heat and tenderness over the affected area. In all the cases Neerkuri showed straw yellow colour and less frothy. Among the 20 out patients 45% of the patients showed vatha neer (aravena neelal), 40% of the patients showed kaba neer (aazhipol paraval) and 15% of the patients showed pitha neer (Muthu othu nitral).

Out of 20 in patients 40% of the patients showed vatha neer, 45% of the patients showed kaba neer and 15% of the patients showed pitha neer.

Out of 20 in patients 60% of the patients had Vathapitha Naadi and a few had Pithavatha Naadi and Vathakabam.

Out of 20 out patients 55% of the patients had vathapitha naadi, 35% of the patients had Pithavatha vatha naadi and 10% of the patients had vatha kaba naadi.

25% of the in patients and 15% of the Out patients had pallor.

Out of 20 out patients 10% of the patients had horseness of voice.

Constipation occurred in 60% of in patients and 45% of out patients.

19. Investigations:

A. HB:
B V A – P < 0.05 – Moderately significant.
HB – Before treatment – 10.55 ± 1.74
HB – After treatment – 11.06 ± 1.92
In this study, after to the treatment moderate improvement occur in heamoglobin level.

B. ESR ½ hour:
Before treatment – 22.34 ± 20.2
After treatment – 15.3 + 13.15
P < 0.001 – Highly Significant.

ESR 1 hour:

Before treatment – 43.85 + 35.58
After treatment – 31.45 + 27.64
P < 0.0007 – Highly significant.

In this study, after to the treatment moderate improvement occur in ESR level.

C. Improvement table of RA factor and CRP:

<table>
<thead>
<tr>
<th>S.NO</th>
<th>Out patients</th>
<th>In patients</th>
<th>No of negative cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No of cases</td>
<td>No of cases</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BT</td>
<td>AT</td>
<td>BT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AT</td>
</tr>
<tr>
<td>RA</td>
<td>9</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>CRP</td>
<td>6</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>

Out of 40 cases 17 cases had RA factor positive and after to the treatment 3 cases only had negative result.

Out of 40 cases 18 cases had CRP positve and 8 cases had negative result in after the treatment.
Improvement assessed by following assessments:

1. Pain assessment scale.
2. Restricted movement assessment grade.
3. Hb & Erythrocyte sedimentation rate variation.
4. RA factor & CRP variation.

Over all results.

<table>
<thead>
<tr>
<th>SI. No</th>
<th>Results</th>
<th>In - Patients</th>
<th>Out - Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
<td>No. of Cases</td>
</tr>
<tr>
<td>1</td>
<td>Good Improvement</td>
<td>9 45</td>
<td>12 60</td>
</tr>
<tr>
<td>2</td>
<td>Moderate Improvement</td>
<td>5 30</td>
<td>5 20</td>
</tr>
<tr>
<td>3</td>
<td>Mild Improvement</td>
<td>4 20</td>
<td>3 15</td>
</tr>
<tr>
<td>4</td>
<td>No Improvement</td>
<td>1 5</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Deteriorated</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>20 100</td>
<td>20 100</td>
</tr>
</tbody>
</table>
Out of 20 In-Patients, 45% of cases showed good improvement 30% cases showed moderate improvement and 20% of cases showed mild improvement. Out of 20 out-Patients, 60% of cases showed good improvement, 20% of cases showed moderate improvement and 15% of cases showed mild improvement. 5% of in patient showed no improvement.
OVERALL IMPROVEMENT FOR OUT PATIENT DEPARTMENT

<table>
<thead>
<tr>
<th>S.No</th>
<th>Op. No</th>
<th>Age/Sex</th>
<th>Date of Treatment Starting</th>
<th>End of The Treatment</th>
<th>Improvement</th>
<th>Duration of illness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A.L.9173</td>
<td>37/F</td>
<td>09.08.08</td>
<td>02.09.08</td>
<td>Good</td>
<td>3 month</td>
</tr>
<tr>
<td>2.</td>
<td>A.L.8950</td>
<td>31/F</td>
<td>09.08.08</td>
<td>02.09.08</td>
<td>Good</td>
<td>3 month</td>
</tr>
<tr>
<td>3.</td>
<td>A.m.48</td>
<td>55/F</td>
<td>13.08.08</td>
<td>04.09.08</td>
<td>Good</td>
<td>&gt; 1 yr</td>
</tr>
<tr>
<td>4.</td>
<td>A.m.732</td>
<td>29/F</td>
<td>18.08.08</td>
<td>08.09.09</td>
<td>Mild</td>
<td>&gt; 1 yr</td>
</tr>
<tr>
<td>5.</td>
<td>A.L.7238</td>
<td>42/F</td>
<td>11.09.08</td>
<td>02.10.08</td>
<td>Mild</td>
<td>&gt; 6 month</td>
</tr>
<tr>
<td>6.</td>
<td>A.K.271</td>
<td>39/F</td>
<td>17.08.08</td>
<td>08.10.08</td>
<td>Good</td>
<td>3 month</td>
</tr>
<tr>
<td>7.</td>
<td>W.368</td>
<td>44/F</td>
<td>20.08.08</td>
<td>11.09.08</td>
<td>Good</td>
<td>1 yr</td>
</tr>
<tr>
<td>8.</td>
<td>A.m.22</td>
<td>38/F</td>
<td>13.08.08</td>
<td>04.09.08</td>
<td>Good</td>
<td>1 1/2 yr</td>
</tr>
<tr>
<td>9.</td>
<td>A.m.777</td>
<td>33/F</td>
<td>17.08.08</td>
<td>09.09.09</td>
<td>Good</td>
<td>&gt; 6 month</td>
</tr>
<tr>
<td>10.</td>
<td>A.m.825</td>
<td>29/F</td>
<td>17.08.08</td>
<td>09.09.08</td>
<td>Good</td>
<td>&gt; 6 month</td>
</tr>
<tr>
<td>11.</td>
<td>A.m.1838</td>
<td>38/F</td>
<td>10.9.08</td>
<td>02.10.08</td>
<td>Moderate</td>
<td>8 month</td>
</tr>
<tr>
<td>12.</td>
<td>A.m.4364</td>
<td>46/F</td>
<td>09.09.08</td>
<td>29.09.08</td>
<td>Moderate</td>
<td>3 month</td>
</tr>
<tr>
<td>13.</td>
<td>O.5893</td>
<td>32/F</td>
<td>11.09.08</td>
<td>03.10.08</td>
<td>Moderate</td>
<td>6 month</td>
</tr>
<tr>
<td>14.</td>
<td>O.2447</td>
<td>40/F</td>
<td>04.09.08</td>
<td>24.09.08</td>
<td>Good</td>
<td>&gt; 3 month</td>
</tr>
<tr>
<td>15.</td>
<td>A.N.1856</td>
<td>42/F</td>
<td>13.10.08</td>
<td>04.10.08</td>
<td>Good</td>
<td>1 1/2 yr</td>
</tr>
<tr>
<td>16.</td>
<td>A.N.1846</td>
<td>55/M</td>
<td>04.10.08</td>
<td>25.10.08</td>
<td>Moderate</td>
<td>1 yr</td>
</tr>
<tr>
<td>17.</td>
<td>A.m.191</td>
<td>48/M</td>
<td>14.08.08</td>
<td>05.09.08</td>
<td>Good</td>
<td>&gt; 6 month</td>
</tr>
<tr>
<td>18.</td>
<td>A.N.1150</td>
<td>38/F</td>
<td>10.10.08</td>
<td>01.11.08</td>
<td>Moderate</td>
<td>4 month</td>
</tr>
<tr>
<td>19.</td>
<td>A.N.4353</td>
<td>45/F</td>
<td>11.10.08</td>
<td>02.11.08</td>
<td>Good</td>
<td>5 month</td>
</tr>
<tr>
<td>20.</td>
<td>A.N.5285</td>
<td>32/F</td>
<td>22.10.08</td>
<td>13.11.08</td>
<td>Mild</td>
<td>8 month</td>
</tr>
</tbody>
</table>
OVERALL IMPROVEMENT FOR IN PATIENT DEPARTMENT:

<table>
<thead>
<tr>
<th>S.N.</th>
<th>IP. No</th>
<th>Age/Sex</th>
<th>Date of Admission</th>
<th>Date of Discharge</th>
<th>Treatment days in IP</th>
<th>Improvement</th>
<th>Duration of illness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1074</td>
<td>34/F</td>
<td>08.08.08</td>
<td>29.08.08</td>
<td>20</td>
<td>Good</td>
<td>&lt; 1 yr</td>
</tr>
<tr>
<td>2.</td>
<td>1103</td>
<td>30/F</td>
<td>21.08.08</td>
<td>12.09.08</td>
<td>20</td>
<td>Mild</td>
<td>&lt; 1 yr</td>
</tr>
<tr>
<td>3.</td>
<td>1095</td>
<td>43/F</td>
<td>19.08.08</td>
<td>11.09.08</td>
<td>20</td>
<td>Moderate</td>
<td>&gt; 1 yr</td>
</tr>
<tr>
<td>4.</td>
<td>1097</td>
<td>40/F</td>
<td>20.08.08</td>
<td>12.09.08</td>
<td>20</td>
<td>Good</td>
<td>&gt; 5 yr</td>
</tr>
<tr>
<td>5.</td>
<td>1631</td>
<td>25/M</td>
<td>16.09.08</td>
<td>29.09.08</td>
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Ayothidhasar Pandithar Hospital, National Institute of Siddha, Tambaram sanatorium.

OUT PATIENTS SEROLOGICAL IMPROVEMENT REPORT:

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TABLE ILLUSTRATES THE IMPROVEMENT OF HEAMOGLOBIN & ESR:

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TABLE ILLUSTRATES THE IMPROVEMENT OF HEMOGLOBIN & ESR:

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DISCUSSION
DISCUSSION:

The main aim of treatment is to keep the Trithodam in equilibrium state, and to keep the inflammatory process at a minimum thereby preserving joint motion, reducing constitutional symptoms, maintaining healthy muscles, preventing joint stiffness, restricted movements and the development of deformity.

40 cases (20 Out-Patients and 20 In-Patients) were selected from the patients reporting in Pothu maruthuvam department, Ayothidoss pandithar hospital of NIS, satisfying inclusion and exclusion criteria will be eligible for admission to the trial. To balance the altered three thathus purgative was given on previous day to start the treatment. Hence all the patients were given Merugulli thylam 10 ml with warm water and were put on diet to take only butter milk.

The patients were treated for a period of 20 days with the trial drugs such as Rasapralaya chenthuram was given internal at the dose of 100 mg b.i.d with the vehicle of thirikaduku chooramam and adjuvant of honey and Navanatha siddhar thylam applied externally over affected joints. Out-Patients were reviewed once in seven days. Clinical and assessments of In-Patients were reviewed daily.

Before starting the treatment, instructed the patients to stop if any medicines taken internally. All the patients were advised to follow strict diet restriction and peaceful life style to normalize the immune mechanism. Advised the patient to take warm water bath and hot fermentation therapy to reduce the stiffness. Ottradam was done over the inflammatory joints using Vatha Narayanan leaves, Erukku leaves, Notchi leaves, Neem leaves and Thazhuthalai leaves.

Mild exercises advised to reduce the stiffness and restricted movements. Savasana, breathing excercise also advised to relief stress and sleeplessness. The triggering factors were also studied. Daily observation was made during this study.
The observations discussed below:

**Sex Distribution:**

From this study it is clear that the incidence was higher in females than in males. In this study male and female ratio occur in 1:4. It indicates Udhiravatha Suronitham is predominant in females.

**Age Distribution:**

The study reveals that the incidence of disease was more predominant in 4th, 5th decades of life. Further it was concluded that majority of cases (70 %) were affected in their Pitha kaalam (i.e. Middle 33 years and 4 months).

**Thinai:**

In this study most of the cases comes from Neithal nilam.

"GameObjectASÁ III Ä£¾,Íô"

According to siddha literature Pathartha guna chinthamani mentioned vatha diseases occurs more in Neithal nilam.

**Paruva kaalam:**

Siddha literature Yugi vaithya chinthamani mentioned

"¬¾¨Äô Àº¢§Â¡Î ¸¡÷ò¾¢ ¾ýÉ¢ø
«¼Õ§Á ÁüÈ Á¡¾í¸û ¾ýÉ¢ø"

In this study most of the cases admitted in Karkaalam, Koothirkaalam.

**Occupational status:**

Most of the cases are (45 %) coolies and non workers (32.5%). Mostly coolies belongs to poor socio economical status, their poverty and stress induce this disease. Most of the non workers are house wife.
**Diet reference:**

Most of the cases (95 %) were non vegetarian and Non vegetarian diet may aggravates the disease process.

**Socio-Economic Status:**

Majority of the cases (50 %) belongs to poor socio-economical condition. It indicates malnutrition, lowered immune responses and emotional stress made them more prone to this disease.

**Etiological Factors:**

From this study the etiology of the disease remains unknown. However changes in food habits and life style predisposes to the derangement of three humors resulting in the causation of disease.

**Mode of Onset:**

In my observation most of the patients comes with gradual onset. Failure to follow medical advice regarding dietary restrictions, stress and strain, changes in life style all accounts for the disease to become chronic.

**Duration of Illness:**

Most of the cases (27.5 %) were affected with the duration of illness between 6 – 12 months. 25% of cases were affected with duration of illness 1 – 2 years.

**Clinical Manifestations:**

In this study, joint pain and major joint swelling relieved in some of the cases and reduced in most of the cases.

Minor joint swelling relieved in 30 % of cases and reduced in 70 % of cases and Restricted movement reduced in 60 % of cases.

Sleeplessness and Loss of appetite are relieved in some cases only and reduction of some degree in most of the cases.

After treatment, the early morning stiffness which occured for a period of >1 hr has been reduced to 10 – 20 min.
Systemic Examination:

Out of 40 cases, minimal cases only had subcutaneous nodules, muscle wasting and peripheral neuritis. After this treatment there are no changes in subcutaneous nodules. There was mild improvement in muscle wasting and peripheral neuritis.

Deformity:

In this study there is no improvement in deformity.

Changes in functional ability:

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<td>1</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Among the 40 cases, before treatment 37.5% of cases belongs to G III and after treatment 12.5% of cases were reducing their restriction.

After to treatment 25% of cases had no restriction in their normal activities.

Before to treatment 2.5% of cases belong to G IV and after to treatment there is no changes occur.
MUKKURAM BASIS:

A. Disturbances in Vatham:

During the treatment Abanan affected (constipation) in some cases and advised to take more greens, vegetables and water. Most of the cases relieved from Constipation and for some cases only prescribed nilavagai chooranam.

In most of the cases devathamathan affected due to sleeplessness and advised to do savasana and breathing exercise; in my study due to these patients get some relief.

B. Disturbances in Kabham:

Santhigam affected in all cases due to pain, swelling and restricted movement. After the treatment moderate improvement occurs in pain and swelling, mild reduction occurs in restricted movement.

Involvement of Seven Udhal Thathukkal:

Among 20 In-Patients and 20 Out-Patients, Saaram, Senneer, Oon, Kozhuppu and Enbu were affected in all the cases.

Affected Saaram produces fatigue in patients. After the treatment it releives in some patients, it may be due to medicine and advised to take nutricious diet.

Affected Senneer produces variation in the level of Hb, increased ESR, and positive CRP & Rheumatoid factor. After the treatment from the statistical analysis moderate improvements occur in Hb level \( (B \ V \ A - P < 0.05 - \text{Moderately significant}) \) and ESR level \( (P + 0.0007 - \text{Highly significant}) \).

Affected Kozhuppu produces restriction of movements in joints and after the treatment 25 % of cases had no restriction in their normal activities. 12 .5 % of cases were reduce their restriction from GIII restricted movement.

Affected Enbu produces joint pain, joint deformity. After to this treatment there is no changes occur in deformity and pain reduced in most of the cases.

Envagai Thervugal:
Among 40 cases *Naa* was affected in most (65% of IP & 75% of OP) the cases due to coated tongue. After reducing constipation, coated tongue was disappearing in most cases.

Pallor of the tongue and pallor of palpabral conjuctiva (due to *vizhi* affected) occur in minimal cases only and after to treatment paleness was reduced.

*Mozhi* was affected in 10% of OP cases due to hoarseness of voice and after to this treatment horseness persist in one case.

*Malam* was affected in 60% of In-Patients and 45% of Out-Patients having constipation, advised to take more greens, vegetables and water. Most of the cases relieved from Constipation and for some of the cases only prescribed nilavagai chooranam.

*Sparisam* was affected in all the cases producing swelling and warmth in the painful joints and after to treatment swelling relived in some cases and reduced in most of the cases.

Regarding Moothiram, neerkuri was normal in all the cases.

- *Neikuri* showed Vatha Neer (Spread likes snake) in 40% of In-Patients and 45% of Out-Patients.
- 15% of In-Patients and out-Patients showed pitha neer.
- 45% of In-patients and 40% of out patients showed kaba neer.

After to the treatment there is no significant changes occur in neikuri.

**Investigations:**

After to this treatment most of the cases had some improvement in their Hb level, CRP & RA factor. Statistical analysis in serological report indicates significant changes occur in Hb and ESR level.

<table>
<thead>
<tr>
<th>S.NO</th>
<th>Out patients</th>
<th>In patients</th>
<th>No of negative cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No of cases</td>
<td>No of cases</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BT</td>
<td>AT</td>
<td>BT</td>
</tr>
<tr>
<td>RA</td>
<td>9</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>CRP</td>
<td>6</td>
<td>3</td>
<td>12</td>
</tr>
</tbody>
</table>
Out of 40 cases 17 had RA factor positive and after to the treatment 3 cases only had negative result.

Out of 40 cases 18 cases had CRP positive and 8 cases had negative result in after the treatment

**Biochemical analysis:**

- Qualitative analysis of Rasapralaya chenthuram done in C.L. Beid metha college of Pharmacy, Thoraippakkam reveals Rasapralaya chenthuram contains Calcium, Iron, Magnesium, Zinc etc.
- Quantitative analysis done in Mettex laboratory by Atomic absorption method, Rasapralaya chenthuram contains 622 mg/ kg of Magnesium, 0.49 % of Calcium, 946 mg/kg of Iron and 13.1 mg/ kg of Zinc.
- Zn plays a vital role in immunity and it prevents infection. It also acts as an antioxidant. Iron is essential for transport of oxygen to the tissues. In Uthiravatha suronitham, anemia is one of the features. Statistical analysis from laboratory reports showed Moderate significant in haemoglobin level. Calcium is necessary for the regulation of acid base balance and water balance in the body and it also prevents the development of osteoporosis.

**Toxicity study:**

- Toxicological study of Rasapralaya chenthuram were done in C.L. Beid Metha college of Pharmacy, Thoraippakkam, Acute oral toxicity study on RPC did not exhibit any mortality in rat at the dose of 2000 mg/kg/po.
- In repeated oral toxicity study for 15 days at the dose of 500 mg/kg/poin rats, did not exhibit toxicity in Haematopoetic system and Liver. However the drug exhibited an increase in uric acid level after the administration for 15 days.
- Did not exhibit any significant changes in RBC count and Hb%. The bio markers of liver function tests did not show the evidence of liver toxicity. There were no significant changes in Haematological parameters like cholesterol, body weight, food, water intake and behavioural parameters.
- Pharmacological studies done in C.L. Beid Metha college of Pharmacy, Thoraippakkam reveals Rasapralaya chenthuram bears significant analgesic and Anti inflammatory actions in rats. The test drug showed maximum anti inflammatory activity at the end of 4 th hour to compared diclofinac sodium and Navanatha siddhar thylam had significant acute anti inflammatory activity.
Anti arthritic study done in S.S.N.college reveals Rasapralaya chenthuram have moderate anti arthritic activity.
SUMMARY
SUMMARY

- The aim of the study is to evaluate the efficacy and safe chemotherapy for Uthiravatha suronitham.

- For the clinical study, 40 cases were selected based on the inclusion and exclusion criteria. Out of this 20 cases were treated in OPD and 20 cases were treated in IPD of Ayothidoss Pandithar Hospital of National Institute of Siddha, Chennai.

- Clinical diagnosis of Uthiravatha suronitham was done by Siddha and modern methodology.

- Investigations carried out before and after treatment and data were recorded in the proforma.

- A day before starting the trial drug treatment, purgation was given to correct the elevated mukkurams.

- The trial medicines selected for both internal and external treatment were Rasapralaya chenthuram – 100 mg b.i.d with the adjuvant of honey, vehicle of thirikaduku chooranam and Navanatha siddhar thylam respectively.

- During the period of the treatment all the patients were put under pathiyam.

- The improvement of the patients was observed from the second day of the treatment itself in general and clinical assessments noted in daily progress chart. Observation made during the clinical study showed that the trial drug was clinically effective.

- It is more prevalent in Kaarkalam and Koothir kalam. Most of the patients are female and most of the patients were belongs to poor socio-economical status.

- Most of the patients had vatha pitha naadi and pitha vatha naadi. In neikkuri, vatha neer and kaba neer showed in most of the cases.
In my observation stress, malnutrition and poor socio-economical status is aggravates this disease.

During the study period, there was no drug reactions occur.

In these studies out of 40 cases, 21 cases were good improvement, 10 cases were moderate improvement and 7 cases were mild improvement in clinical as well as laboratory investigation procedure also.

As per our Siddha Materia medica the ingredients of the trial drugs were found to have the property of controlling vatha diseases.

From the Acute toxicity study, the trial drug is safe even at higher dose of 2000 mg/kg/po.

Repeated oral toxicity study for 15 days exhibited, alteration in uric acid level and the trial drug did not exhibit any alteration in the normal architecture of the kidney at the end of 15 days. Since there is no report on the kidney function test done in clinical study, it can be reasonably assumed that the drug is safe for humans.

The formulation exhibited significant anti oxidant activity and no change in the LPO activity in rat treated for 15 days.

Pharmacological study showed the trial drug contains significant anti arthritic, anti-inflammatory and analgesic activity.
CONCLUSION
CONCLUSION

Acute toxicity study reveals that the trial drug is safe even at higher dosage of 2000 mg/kg/po but in repeated toxicity study there was a mild variation only in uric acid level at the dosage of 500 mg/kg/po. Since there are no reports on the kidney function test done in clinical study, it can be resonably assumed that the drug is safe for human.

Clinical study reveals that the trial drug shows good improvement (55 %, moderate, 25 %, mild and 17.5%) and No improvement in 2.5% of cases. There were no adverse effects found during the course of the treatment.

Because of the encouraging clinical results, if the study may be undertaken with the same drug for a prolonged period of time with more number of cases, it may become one of the milestones in treating Uthiravatha suronitham successfully.
ANNEXURES
Preparations and Properties of the Trial drugs
அச்சின் நோக்கங்கள்

நிறுவன் சாதனங்கள்:

ஆக்தி செய்யப்பட்ட 3 பவுலன் (105 கிராமம்), சுயம் செய்யப்பட்ட பலவகைகள் 2.1/2
பவுலன் (87.1/2 கிராமம்), பூச்சியத்தையில் தொடு, வல்லம்புக்குட்பட்டு, பிறந்தந்த்துக்குட்பட்டு, வல்லம்புக்குட்பட்டு, முழுக்கான வெளாட்டு, பிறந்தந்த்துக்குட்பட்டு, சிலை அகரம் வளர்ந்துக்குட்பட்டு அளவே.

நோக்கங்கள்: இந்தப் பூந்திகரம் முக்கியத்துவமானது முக்த குடியார் அணுகுமாளாம் அப்பாவற்று வல்லத்தையில் வைத்திருந்து நூற்றுக்கும் முறையாக எழுத்து பெறுவதற்காக பெற வைத்திருந்து நூற்றுக்கும் முறையாக வைத்திருந்து எழுத்து பெறுவதற்காக பெற வைத்திருந்து நூற்றுக்கும் முறையாக வைத்திருந்து எழுத்து பெறுவதற்காக பெற

குறிப்பிட்டது: பூந்திகரம் முக்கியத்துவமானது முக்த குடியார் அணுகுமாளாம் அப்பாவற்று வல்லத்தையில் வைத்திருந்து நூற்றுக்கும் முறையாக எழுத்து பெறுவதற்காக பெற வைத்திருந்து

உருமானாள், புருவானாள்: முக்கியத்துவமான உருமானாள் முக்த குடியார் அணுகுமாளாம் அப்பாவற்று வல்லத்தையில் வைத்திருந்து நூற்றுக்கும் முறையாக எழுத்து பெறுவதற்காக பெற வைத்திருந்து

1 அரை அடுக்கு, உருசியானாள் முக்த குடியார் அணுகுமாளாம் அப்பாவற்று வல்லத்தையில் வைத்திருந்து நூற்றுக்கும் முறையாக எழுத்து பெறுவதற்காக பெற வைத்திருந்து
நூறுண்டிகள் அகாலம்:

சுயின்னி குடூரவு பார்க்கின் கோதும்

திரிகார் அய்வாகின் கலன்மை

விதிகள் பாதசல் கவரிகள்

பாசுசெயலார் பாலசுசெயலார்

விதிகள பாதுகாக்கும் கலன்மை

பாலசுசெயலார்

நமது பட்டையில் நம் கோதும்

தொடர் குணப்பூத்து

நமது பட்டையில் நம் கோதும்

தொடர் குணப்பூத்து

நமது பட்டையில் நம் கோதும்

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நமது பட்டையில் நம் கோதும்

தொடர் குணப்பூத்து

நமது பட்டையில் நம் கோதும்

தொடர் குணப்பூத்து

நமது பட்டையில் நம் கோதும்

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தொடர் குணப்பூத்து

நமது பட்டை�
TRIAL MEDICINES
INGREDIENTS OF RASAPRALAYA CHENTHURAM
Hybiscus rosa sinensis          Punica granatum          Solanum nigrum

Barleria Prionitis             Mollugo lotoidus

Sulphur                         Mercury

மரு (Mercury)

பொருள்: இராணி, எலுமிப்குறி, தஞ்சை, சுரு.
கலவு: அயதுகையான கிரும்பும் தொட்டைக்கான் இருக்கும் பல கையார்.

சிவப்பு: குரு, தேய்ப்ப சிவப்பு.

பிறை: துணைக்கருத்தை பிள்ளைகள் கொண்ட கீழை.

சேர்கள்: வாய்ப்புவளி.

சிவப்பு காலம்: 'கிரும்பும் கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு

குரு காலம்: "கிரும்பும் கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு

நீர்க்கிளாண்டு கலண்டர், கிரும்பு, தேய்ப்பு, தேய்ப்பு, பொய்ப்பு, வெள்ளு, வெள்ளு வெள்ளு வெள்ளு வெள்ளு, உள்ள வெள்ளு வெள்ளு வெள்ளு

குரு (SULPHUR)

சோம வம்பர்: கருகையால் நாற்ப, தேய்ப்பவர்கள், குரும்பங்கள், பூச்சி, எல்லாத் செயற்கை, குரு வம்பர்.

சோம வளம்: கருப்பு, தேய்ப்பு.

சோம வரைய: பிரித்துச் சிறுத்து.

சோம வடிவ: கீரகமானது.

சோம விளக்கம்: "கிரும்பும் கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு கிரும்பு

சோம விளக்கம் (Solanum nigrum)
சத்ர பொருள்: மலர்பாத்தி, மருத்துவக் கலை குறிப்பு

வடிவ: குறிப்பு

முறைமை: குறிப்பு

சொல்லறிக்கை: மலர்பாத் - Alternative

சுருக்கக்குறிப்பு: – Diuretic

வளர்ச்சிக் காலம்: மலர்பாத்திக் காலம், மலர்பாத்தி முடியும் காலம். பாலூத்தி அல்லது குழாயிடம் பாலூத்தி பாலூத்தி குழாயிடம் பாலூத்தி! தொலை மலர்பாத்தியும் குழாயிடம் குழாயிடம்

மலர்பாத் திண்மக் குறிப்பு, வெப்பக் குறிப்பு மருத்துவக் குறிப்பு காலம்.

செத்துப்பொருள் (Mollugo lotoidus)

சத்ர பொருள்: செத்துப்பொருள்

வடிவ: குறிப்பு

முறைமை: குறிப்பு

சொல்லறிக்கை: செத்துப்பொருள் குறிப்பிட்டத் தொண்டு செத்து

வளர்ச்சிக் காலம்: செத்துப்பொருள் காலம், வெப்பக் குறிப்பிட்டத் தொண்டு தொண்டு

சுருக்கக்குறிப்பு: – Stimulant

செத்துப்பொருள்: செத்துப்பொருள்

காலம்: குறிப்பிட்டத்

முறைமை: குறிப்பு

சொல்லறிக்கை: செத்துப்பொருள் குறிப்பிட்டத்

வளர்ச்சிக் காலம்: செத்துப்பொருள், மலர்பாத்தி மருத்துவக் குறிப்பு காலம்.

செத்துப்பொருள் (Punica granatum)

சத்ர பொருள்: செத்துப்பொருள்

வடிவ: குறிப்பிட்டத்

முறைமை: குறிப்பிட்டத்

சொல்லறிக்கை: செத்துப்பொருள்

வளர்ச்சிக் காலம்: செத்து வெப்பக் குறிப்பிட்டத்

சுருக்கக்குறிப்பு: – Alternate

செத்துப்பொருள்: – Diuretic

வளர்ச்சிக் காலம்: செத்து, மலர்பாத்தி முடியும் காலம், வெப்பக் குறிப்பிட்டத்

சொல்லறிக்கை: செத்து குறிப்பிட்டத்

வளர்ச்சிக் காலம்: செத்து வெப்பக்

சுருக்கக்குறிப்பு: – Stimulant
SEMULLI (Barleria prionitis) :

Part used : Whole plant, Root, Leaf, Bark, Flower.
Action :
Hypoglycemic
Diuretic
Spasmogenic
Hypotensive
Hypothermic.

Use:
The plant has antiseptic properties, its decoction is used as a wash in dropy. The leaves and flowering tops are rich in soluble potassium salts and are valued as diuretic.

STATISTICAL ANALYSIS
HAEMOGLOBIN BEFORE AND AFTER TREATMENT COMPARISION:

**Paired t test**

---

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Err.</th>
<th>Std. Dev.</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>hbbt</td>
<td>40</td>
<td>10.55</td>
<td>0.2753087</td>
<td>1.741205</td>
<td>9.993136 - 11.10686</td>
</tr>
<tr>
<td>hbat</td>
<td>40</td>
<td>11.07</td>
<td>0.3027944</td>
<td>1.91504</td>
<td>10.45504 - 11.67996</td>
</tr>
<tr>
<td>diff</td>
<td>40</td>
<td>-0.52</td>
<td>0.253182</td>
<td>1.601264</td>
<td>-1.029609 -0.0053911</td>
</tr>
</tbody>
</table>

**Ho:** mean(hbbt - hbat) = mean(diff) = 0
Ha: mean(diff) < 0        Ha: mean(diff) ~= 0        Ha: mean(diff) > 0
  t =  -2.0440              t =  -2.0440              t =  -2.0440
P < t =   0.0239          P > |t| =   0.0477          P > t =   0.9761

ESR 1/2 Hour - BEFORE AND AFTER COMPARISION:

Paired t test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Err.</th>
<th>Std. Dev.</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>esrhbt</td>
<td>40</td>
<td>22.4</td>
<td>3.194707</td>
<td>20.2051</td>
<td>15.93809 28.86191</td>
</tr>
<tr>
<td>esrhat</td>
<td>40</td>
<td>15.3</td>
<td>2.079879</td>
<td>13.15431</td>
<td>11.09305 19.50695</td>
</tr>
<tr>
<td>diff</td>
<td>40</td>
<td>7.1</td>
<td>2.04055</td>
<td>12.90557</td>
<td>2.972597 11.2274</td>
</tr>
</tbody>
</table>

Ho: mean(esrhbt - esrhat) = mean(diff) = 0

Ha: mean(diff) < 0        Ha: mean(diff) ~= 0        Ha: mean(diff) > 0
  t =   3.4795              t =   3.4795              t =   3.4795
P < t =   0.9994          P > |t| =   0.0013          P > t =   0.0006

ESR 1 Hour - BEFORE AND AFTER COMPARISION:

Paired t test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Err.</th>
<th>Std. Dev.</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>esr1bt</td>
<td>40</td>
<td>43.85</td>
<td>5.62601</td>
<td>35.58201</td>
<td>32.47032 55.22968</td>
</tr>
<tr>
<td>esr1at</td>
<td>40</td>
<td>31.45</td>
<td>4.371814</td>
<td>27.64978</td>
<td>22.60717 40.29283</td>
</tr>
<tr>
<td>diff</td>
<td>40</td>
<td>12.4</td>
<td>3.358838</td>
<td>21.24316</td>
<td>5.606108 19.19389</td>
</tr>
</tbody>
</table>

Ho: mean(esr1bt - esr1at) = mean(diff) = 0

Ha: mean(diff) < 0        Ha: mean(diff) ~= 0        Ha: mean(diff) > 0
Comparision of RA facto before and after treatment:

<table>
<thead>
<tr>
<th></th>
<th>RAAT</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>P</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>RAAT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>20</td>
<td>0</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>3</td>
<td>17</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>17</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

Due to adequate sample size, the significance of treatment could not be statistically determined.
Bio – Chemical Analysis
## BIO CHEMICAL ANALYSIS

<table>
<thead>
<tr>
<th>S.NO</th>
<th>EXPERIMENT</th>
<th>OBSERVARTION</th>
<th>INERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Appearance of the sample</td>
<td>Dark brown in colour.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td><strong>Solubility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. A little of the sample</td>
<td>Sparingly soluble.</td>
<td>Presents of Silicate</td>
</tr>
<tr>
<td></td>
<td>is shaken well with</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>distilled water.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. A little of the sample</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>is shaken well with con.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HCIL / Con. H2So4.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A small amount of the sample</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>is taken in a dry test</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>tube and heated gartly</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>at first and then strong.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td><strong>Flame Test</strong></td>
<td>Blush green flame not</td>
<td>Absence of copper.</td>
</tr>
<tr>
<td></td>
<td>A small amount of the sample</td>
<td>appeared.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>is made into a pasted</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>with con. HCL in a watch</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>glass and introduced</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>into non – luminous part</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>of the bunsen flame.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td><strong>Ash Test</strong></td>
<td>Yellow colour flame</td>
<td>Presents of sodium.</td>
</tr>
<tr>
<td></td>
<td>A filter is soaked into a</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>mixture of sample and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>cobalt nitrate solution</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>and introduced into the</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>bunsen flame and ignited</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Preparation of Extract

5 gm of Panchalavana Mezhugu is weighed accurately and placed in a 250 ml clean beaker and added with 50 ml of distilled water. Then it is boiled well for about 10 minutes. Then it is cooled and filtered in a 100ml volumetric flask and made up to 100ml with distilled water.

<table>
<thead>
<tr>
<th>S.NO</th>
<th>EXPERIMENT</th>
<th>OBSERVATION</th>
<th>INERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Test for Acid Radicals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Test for Sulphate</td>
<td>Cloudy appearance present.</td>
<td>Presence of sulphate</td>
</tr>
<tr>
<td></td>
<td>2 ml of the above prepared</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>extract is taken in a test tube to</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>this added 2 ml of 4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ammonium oxalate solution.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Test of Chloride</td>
<td>Cloudy appearance presents.</td>
<td>Presents of Chloride.</td>
</tr>
<tr>
<td></td>
<td>2 ml of the above prepared</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>extract is added with 2ml of dil</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Hcl is added until the effervescence ceases off.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Test for Phosphate:</td>
<td>Mild yellow appearance.</td>
<td>Phosphate mildly present.</td>
</tr>
<tr>
<td></td>
<td>2ml of the extract is treated with 2 ml of ammonium molybdate solution and 2 ml of con.Hno3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Test for Carbonate</td>
<td>No cloudy appearance.</td>
<td>Absence of carbonate</td>
</tr>
<tr>
<td></td>
<td>2 ml of the extract is treated with 2 ml magnesium sulphate solution.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Test for Fluoride &amp; Oxalate</td>
<td>No cloudy</td>
<td>Absence of fluride</td>
</tr>
<tr>
<td></td>
<td>2 ml of extract is added with dil. Acetic acid and 2 ml calcium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test</td>
<td>Procedure</td>
<td>Appearance</td>
<td>Conclusion</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>6. Test for Nitrate</td>
<td>3 drops of the extract is placed on a filter paper, on that – 2 drops of acetic acid and 2 drops of Benzidine solution is placed.</td>
<td>No characteristic changes</td>
<td>Absence of borate</td>
</tr>
<tr>
<td>7. Test for Lead</td>
<td>2 ml of the extract is added with 2 ml of potassium iodide solution.</td>
<td>No yellow precipitate is obtained</td>
<td>Absence of lead</td>
</tr>
<tr>
<td>8. Test for Copper</td>
<td>a. One pinch of substance is made into paste with con. HCl in a watch glass and introduced into the non luminous part of the flame</td>
<td>No colour precipitate formed</td>
<td>Absence of copper</td>
</tr>
<tr>
<td>9. Test for Aluminium</td>
<td>To the 2 ml of the extract sodium hydroxide is added in drops to excess.</td>
<td>No characteristic changes</td>
<td>Absence of aluminium</td>
</tr>
<tr>
<td>10. Test for Iron</td>
<td>a. To the 2 ml of extract add 2 ml of ammonium thiocyanate solution.</td>
<td>Blood red colour appeared</td>
<td>Presence of Iron</td>
</tr>
<tr>
<td></td>
<td>b. To the 2 ml of extract 2 ml ammonium thiocyanate solution and 2 ml of con. HN03 is added.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Test for Zinc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Test for Calcium</strong></td>
<td><strong>Test for Magnesium</strong></td>
<td><strong>Test for Ammonium</strong></td>
</tr>
<tr>
<td>---</td>
<td>---------------------</td>
<td>------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>12</td>
<td>To 2ml of extract sodium hydroxide solution is added in drops to excess.</td>
<td>Cloudy appearance and white precipitate is obtained</td>
<td>White precipitate is not obtained</td>
</tr>
<tr>
<td>13</td>
<td><strong>Test for Magnesium</strong></td>
<td>Presence of Magnesium</td>
<td>Presence of calcium</td>
</tr>
<tr>
<td>14</td>
<td>2ml of extract sodium hydroxide solution is added with 2ml of 4% ammonium oxalate solution.</td>
<td>Presence of Calcium</td>
<td>Presence of magnesium</td>
</tr>
<tr>
<td>15</td>
<td>To 2ml of extract is added with 2ml of 4% ammonium oxalate solution.</td>
<td>Cloudy appearance and white precipitate is obtained</td>
<td>Presence of magnesium</td>
</tr>
<tr>
<td>16</td>
<td><strong>Test for Ammonium</strong></td>
<td>Absence of ammonium</td>
<td>Absence of mercury</td>
</tr>
<tr>
<td>17</td>
<td>To 2ml of extract is added with 2ml of sodium hydroxide solution.</td>
<td>Presence of magnesium</td>
<td>Presence of mercury</td>
</tr>
<tr>
<td>III</td>
<td>Miscellaneous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>----------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td><strong>Test for Starch</strong>&lt;br&gt;2ml of extract is treated with weak iodine solution.</td>
<td>No blue colour developed</td>
<td>Presence of starch</td>
</tr>
<tr>
<td>19</td>
<td><strong>Test for Reducing Sugar</strong>&lt;br&gt;5ml of Benedict’s qualitative solution is taken in a test tube and allowed to boil for 2 minutes and added 8 to 10 drops of the extract and again boil it for 2 minutes. The Colour changes are noted.</td>
<td>Brick red colour developed</td>
<td>Absence of reducing sugar</td>
</tr>
<tr>
<td>20</td>
<td><strong>Test for the Alkaloids</strong>&lt;br&gt;a. 2ml of the extract is treated with 2ml of potassium iodide solution&lt;br&gt;b. 2ml of extract is treated with 2ml of picric acid</td>
<td>No red colour developed</td>
<td>Absence of alkaloid.</td>
</tr>
<tr>
<td>21</td>
<td><strong>Test for Amino Acid</strong>&lt;br&gt;2 drops of the extract is placed on a filter paper and dried well.</td>
<td>No violet colour developed</td>
<td>Absence of amino acids</td>
</tr>
<tr>
<td>22</td>
<td><strong>Test for Tannic Acid</strong>&lt;br&gt;2ml of extract is teated with 2ml of ferric chloride solution.</td>
<td>No black precipitate is obtained</td>
<td>Presence of Tannic acid</td>
</tr>
<tr>
<td>23</td>
<td><strong>Test for type of Compound</strong>&lt;br&gt;2ml of the extract is teated with 2ml of ferric chloride solution.</td>
<td>No colour change</td>
<td>Absence of oay quinole pinephrine and pyro catechol</td>
</tr>
<tr>
<td>24</td>
<td><strong>Test for Unsaturated Compound</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----</td>
<td>----------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2ml of Biuret reagent is added to the 2ml of extract of potassium permanganate solution is added.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potassium permanganate is not decolourised</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Absence of unsaturated compound</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Acute Toxicity Study
Index

1.0 Materials and Methods

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1.2 Preparation of drugs for dosing
1.3 Drugs and Chemicals
1.4 Experimental animals
1.5 Acute oral toxicity study
1.6 Repeated oral toxicity study
1.7 Biochemical studies
1.8 Haematological studies
1.9 Histopathological studies
1.10 Analgesic, Antiinflammatory studies
1.11 In vivo antioxidant study

2.0 Results

2.1 Preliminary phytochemical screening
2.2 Acute oral toxicity study
2.3 Repeated oral toxicity study for 15 days
2.4 Histopathological study
2.5 Analgesic, Antiinflammatory studies
2.6 Antioxidant activity

3.0 Discussion

4.0 Reference
1.0 MATERIALS AND METHODS

1.1 Test Drugs

The following medicine was used in the study was processed by the methods prescribed in standard text books of siddha medicines.

Rasapralya chenthuram (RPS) was prepared by the method prescribed in the text book of Anuboga vaithya navaneetham.

1.2 Preparation of drug for dosing

All drugs used for the study was suspended each time with 1% (w/v) solution of sodium carboxy methyl cellulose before administration.

1.3 Drugs and chemicals

Standard Drugs and fine chemicals used in these experiments were obtained from Sigma Chemicals Company, U.S.A. Other analytical grade chemicals were obtained from S.d. Fine Chemicals Ltd., Mumbai.

1.4 Experimental animals

Colony inbred animals strains of wistar rats of either sex weighing 200 - 250 g were used for the pharmacological and toxicological studies. The animals were kept under standard conditions 12:12 (day/night cycles) at 22°C room temperature, in polypropylene cages. The animals were fed on standard pelleted diet (Hindustan Lever Pvt Ltd., Bangalore) and tap water ad libitum. The animals were housed for one week in polypropylene cages prior to the experiments to acclimatize to laboratory conditions. The experimental protocol was approved by the Institutional Animal Ethical Committee (IAEC).

1.5 Acute oral toxicity study

Acute oral toxicity was conducted as per the OECD guidelines (Organization of Economic Cooperation and Development) 423 (Acute Toxic Class Method). The acute toxic class method is a stepwise procedure with 3 animals of a single sex per step. Depending on the mortality and/or...
moribund status of the animals, on the average 2-4 steps may be necessary to allow judgment on the acute toxicity of the test substance. This procedure results in the use of a minimal number of animals while allowing for acceptable data based scientific conclusion.

The method uses defined doses (5, 50, 300, 2000 mg/kg body weight) and the results allow a substance to be ranked and classified according to the Globally Harmonized System (GHS) for the classification of chemicals which cause acute toxicity.

1.5 Acute oral toxicity study

Acute oral toxicity was conducted as per the OECD guidelines (Organization of Economic Cooperation and Development) 423 (Acute Toxic Class Method). The acute toxic class method is a stepwise procedure with 3 animals of a single sex per step. Depending on the mortality and/or moribund status of the animals, on the average 2-4 steps may be necessary to allow judgment on the acute toxicity of the test substance. This procedure results in the use of a minimal number of animals while allowing for acceptable data based scientific conclusion.

The method uses defined doses (5, 50, 300, 2000 mg/kg body weight) and the results allow a substance to be ranked and classified according to the Globally Harmonized System (GHS) for the classification of chemicals which cause acute toxicity

Wistar albino rats of either sex weighing 200-250 g were fasted overnight, but allowed water ad libitum. Since the formulation is relatively non toxic in clinical practice the highest dose of 2000 mg/kg/p.o (as per OECD guidelines “Unclassified”) was used in the acute toxicity study.

The animals were observed closely for behavioral toxicity, if any by using FOB (Functional observation battery).

1.6 Repeated oral toxicity study

Repeated oral toxicity studies can be used to get additional information regarding the toxicity profile of a chemical. Repeated oral toxicity studies are defined as those studies where the chemical is administered to the animal for a period covering approximately 10% of the expected life of the animal.
Usually, the dose levels are lower than for acute studies and allow chemicals to accumulate in the body before lethality occurs, if the chemical possess this ability.

Experimental procedure

The following experimental procedure was followed to evaluate the repeated oral toxicity study of RPC.

Group I : Control animals received 1%CMC, 2 ml/kg/p.o. for 15days

Group II : Rasapralya chenduram (RPS) inCMC at the dose Level of 500mg/kg/p.o. was given to rats for 15days

Body weight, food intake and water intake was recorded at two intervals with simultaneous observation for toxic manifestation and mortality, if any. At the end of 15days treatment all the animals were sacrificed by over dosage of ether anaesthesia. Blood was collected and used for hematological studies. Section of liver, kidney, and heart were dissected out and kept in 10% formalin for histopathological studies.

1.7 Biochemical studies

Estimation of glucose

Glucose was estimated using commercial Glucose estimation kit (Span Diagnostics) by the method of Barham et al., (1972) and Tenscher. et al., (1971).

Aspartate aminotransferase (AST)

Aspartate aminotransferase was estimated using commercial AST kit (Span Diagnostics) by the method of Reitman and Frankel (1957).
Alanine aminotransferase (ALT)

Alanine aminotransferase was estimated using commercial AST kit (Span Diagnostics) by the method of Reitman and Frankel (1957).

Alkaline phosphatase (ALP)

Alkaline phosphatase was assayed using commercial ALP kit (Span Diagnostics) by the method of King (1934).

Cholesterol

Cholesterol was estimated using the commercial kit (Span diagnostics)

Urea and Uric acid

Urea and Uric acid were assayed using the commercial kit (Span Diagnostics)

1.8 Haematological studies

Erythrocyte count

Erythrocyte count was estimated by Hemocytometer method of Ghai (1995).

Total Leukocyte Count (WBC)

Total Leukocyte Count was estimated by Hemocytometer method of John (1972).

Haemoglobin

Haemoglobin was estimated by method of Ghai (1995).

1.9 Histopathological studies

Animals were sacrificed at the end of repeated oral toxicity and tissues were processed for histopathological studies.
1.10 Analgesic, Antiinflammatory studies

Analgesic activity

Tail Flick method

Wistar rats of either sex (200-250g) were divided into different groups with 6 animals in each group

Group-1. Control animals received 1% CMC 10ml/Kg/po

Group 2. Test drug at the dose of 500mg/kg/po

Withdrawal of tail (Tail Flick) for noxious thermal (radiant heat) can be used for screening drugs with analgesic activity. Radiant heat can be generated by passing electrical current through nichrome wire mounted in an analgesiometer.

The base of the tail of the test rats is placed on a nicrome wire. The tail withdrawal for the radiant heat (flicking response) is taken as the end point. Normally the rats and mice withdraw their tails within 3 – 5 secs. A cutoff time of 10 – 12 secs is used to prevent damage to the tail. Any animal failing to withdraw its tail in 3-5 secs is rejected from the study.

The reaction time of test drug, standard and control are taken at intervals of 30, 60 and 120 mts. A reaction time (withdrawal time) increment of 2-5 secs more than the control animals can be considered for analgesic activity of the drug.

Anti inflammatory activity

Anti inflammatory activity was evaluated in acute model of inflammation. Wistar rats either sex weighing 200-250g were divided into different groups with 6 animals in each group

Group-1. Control group received CMC 10ml/kg/po
Group-2. Received Carrageenan (0.1% solution) and served as positive control

Group-3 Received test drug (RPS) at the dose of 500mg/kg/po

Group-4 received standard drug Diclofenac sodium (5mg/kg/po)

Acute model

Carrageenan induced hind paw edema

The carrageenan assay procedure was carried out according to the method of Wintar et al. (1962). Edema was induced by injecting 0.1 ml of 1% solution of carrageenan in saline into the plantar aponeurosis of the left hind paw of the rats. The extracts, reference drug and the control vehicle (distilled water) were administered 60 min prior to the injection of the carrageenan. The volumes of edema of the injected and contra lateral paws were measured at +1, 3 and 5 hrs after induction of inflammation using a plethysmometer (Bhatt et al., 1977) and percentage of anti-inflammatory activity was calculated.

1.11 In Vivo Antioxidant study

Samples of serum collected from rats treated with test drugs were assayed for GSH (Moron et al., 1979) and LPO (Yagi, 1976) and the results were compared with control group.

2.0 Results

2.1 Preliminary basic, acidic radicals and phytochemical studies

The qualitative chemical analysis and acidic, basic radicals assay of the drugs showed the presence of phytoconstituents and minerals as depicted in (Table 1).
2.2 Acute oral toxicity study:

RPS at the dose of 2000mg/kg/po did not exhibit any mortality in rats. As per OECD 423 guidelines the dose is said to be “Unclassified” under the toxicity scale. Hence further study with higher doses was not executed.

2.3 Repeated oral toxicity for 15 days:

Test drug RPS at the dose of 500 mg/kg/po when administered orally for 15 days in rats did not exhibit toxicity in haematopoeitic system and liver. However the drug exhibited an increase in uric acid level after the administration for 15 days (Tables 2 and 3).

2.4 Histopathological study:

RPS at the dose of 500 mg/kg/po daily administered for 15 days did not show evidence of pathological lesions in the tissues tested (Plate 1).

2.5 Analgesic, Antiinflammatory studies:

RPS at the dose of 500 mg/kg/p.o showed significant analgesic activity in rats (Table-3). RPS also exhibited significant anti-inflammatory activity in carrageenan induced hind paw edema (acute inflammation model) in rats. The results of present study was comparable to that of the standard NSAID Diclofenac sodium (5 mg/kg/p.o) (Table 4).

2.6 Antioxidant activity:

At the end of 15 days repeated oral toxicity study when the plasma of drug treated animals was examined for GSH activity, the level of GSH activity was increased significantly (p>0.001) in test groups. On the other hand there was no difference in the LPO activity of treated animals when compared to control (Table-5).
Discussion

The siddha formulation Rasapralya chenduram (RPC) was tested for its reverse pharmacological and toxicological profiles in the experimental rats. The drug did not exhibit mortality at the highest dose of 2000 mg/kg/p.o. As per OECD 423 guidelines the dose is said to be “Unclassified” under the toxicity scale. Hence further study with higher doses was not executed.

The preliminary phytochemical study revealed the absence of alkaloids and saponins in the test drug. The test drug answered for the presence of calcium, ferrous iron, sulphate, chloride, carbonate and absence for alkaloids and saponins. Repeated oral toxicity study conducted for 15 days with the drug did not exhibit significant changes in RBC count and in Hb%. The biochemical markers of liver function tests did not show evidence of liver toxicity. However, the uric acid level showed an upward trend that may be due to the probable toxic effect on the kidney function after the drug treatment. There was no significant changes in haematological parameters like blood cholesterol, body weight, food, water intake and behavioural parameters.

The test drug exhibited significant analgesic and anti-inflammatory activity in acute experimental inflammatory conditions in rats. A significant anti-inflammatory activity was obtained with the test drug in carrageenan induced hind paw edema model. The test drug showed maximum anti-inflammatory activity at the end of 4th hour after carrageenan challenge. The result of test drug (500 mg/kg/p.o) was comparable to that of Diclofenac Sodium (5 mg/kg/p.o). Since the maximum anti-inflammatory activity (reduction in the paw edema volume) was observed at the end of 4th hour, the mechanism of anti-inflammatory activity of test drug may be attributed for its inhibitory activity on cyclooxygenase (COX) enzymes.

The present study on the reverse pharmacological and toxicological profiles of the drug may be summarized as follows:

1. The drug is safe even at the highest dose of 2000 mg/kg/po. According to OECD classification for toxicity scale this drug comes under the “unclassified” scale.
However caution should be taken to prevent overdosing with the drug since it contains mercury.

2. Though the repeated drug treatment for 15 days exhibited alteration in theuric acid level, the test drug did not exhibit any alterations in the normal architecture of the kidney at the end of 15 days. Since there is no report on the kidney function tests done in clinical study, it can be reasonably assumed that the drug is safe for humans unless and otherwise proved with clinical data generated on kidney function.

3. The formulation exhibited significant antioxidant activity and no change in the LPO activity in rats treated for 15 days.

### Table 1

**Effect of Siddha Formulations (RPC) on Haematological parameters after 15 days repeated oral dosing (500 mg/kg)**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Hb (gm/100ml)</th>
<th>RBC (millions/cu.mm)</th>
<th>WBC (cells/cu.mm)</th>
<th>Differential leucocyte count (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>14.00 ± 0.34</td>
<td>5.18 ± 0.35&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>6500 ± 491.44</td>
<td>Lymphocytes: 76.06 ± 3.89&lt;sup&gt;ns&lt;/sup&gt;</td>
</tr>
<tr>
<td>RPS (500mg/kg, p.o.)</td>
<td>14.50 ± 0.60&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>5.28 ± 0.70&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>6686.66 ± 3.323&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>Monocytes: 5.30 ± 1.04&lt;sup&gt;ns&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

N=6; Values are expressed as mean ± S.D followed by Students Paired ‘T’ Test
Ns – non significant when compared to control groups.

### Table 2

**Effect of Siddha formulation (RPC) on Biochemical markers of liver and kidney after 15 days repeated oral dosing (50 mg/kg/po) in rats**

<table>
<thead>
<tr>
<th>Groups</th>
<th>AST (IU/L)</th>
<th>ALT (IU/L)</th>
<th>Cholesterol (mg/dl)</th>
<th>Creatinin (mg/dl)</th>
<th>Urea (mg/100ml)</th>
<th>Uric acid (mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>70.24±0.23</td>
<td>30.70 ± 0.81</td>
<td>± 45.84 ± 0.58</td>
<td>1.26±0.64</td>
<td>13.86 ± 0.37</td>
<td>1.83 ± 0.58</td>
</tr>
</tbody>
</table>
N=6; Values are expressed as mean ± S.D followed by Students Paired ‘T’ Test
Ns – non significant when compared to control groups
***P<0.001 as compared with control

Table 3

Analgesic activity of (RPC) using Tail flick Method:

<table>
<thead>
<tr>
<th>Groups</th>
<th>Paw licking response (Sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 min (Sec)</td>
</tr>
<tr>
<td>Control</td>
<td>2.266±0.396</td>
</tr>
<tr>
<td>RPS (500mg/kg.p.o.,)</td>
<td>2.811±0.361</td>
</tr>
</tbody>
</table>

n=6, Values are expressed as mean ± S.D using followed by paired T – test
***P<0.001 as compared with control. ns - Non significant as compared with control;

Table 4

Anti inflammatory activity of RPC in carrageenan induced hind paw edema in rats:

<table>
<thead>
<tr>
<th>Groups</th>
<th>Paw volume (ml) by mercury Displacement at regular interval of time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0min</td>
</tr>
<tr>
<td>Control</td>
<td>1.483±0.1915</td>
</tr>
<tr>
<td>RPS (500mg/kg. p.o.,)</td>
<td>1.356±0.1402</td>
</tr>
<tr>
<td>Standard (Dic.Sodium 5 mg/kg/po)</td>
<td>0.835±0.065ns</td>
</tr>
</tbody>
</table>

n=6; Values are expressed as mean ± S.D followed by paired T – test.
ns - Non significant as compared with control;
Table 6:

Anti oxidant activity of Siddha Formulation (RPC) after 15 days repeated oral dosing (500 mg/kg)

<table>
<thead>
<tr>
<th>Groups</th>
<th>LPO</th>
<th>GSH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>0.60 ± 1.37</td>
<td>45.48 ± 2.31</td>
</tr>
<tr>
<td>RPS (500mg/kg, p.o.,)</td>
<td>0.70 ± 4.90&lt;ns&gt;</td>
<td>80.65 ± 0.35&lt;***&gt;</td>
</tr>
</tbody>
</table>

N=6; Values are expressed as mean ± S.D followed by Student T- Test.
<***P<0.001 as compared with control. ns - Non significant as compared with control;

**RASAPRALAYACHENTHURAM**

**ANTIARThRITIC ACTIVITY**

Formaldehyde-induced arthritis in rats

The animals were divided into three groups of five rats. A sub plantar injection of 0.1 ml of 2% (v/v) formaldehyde was administered to the right hind paw on the first and third days of the experiment. The test drug (200 mg/kg body wt.), nalfon (standard) or vehicle (1 ml/kg body wt.) were administered orally once daily for 10 days. The paw volumes were measured using plethysmometer, before the formaldehyde injection (day 0) and repeated every day, for 10 days.

**EFFECT OF RASAPRALAYACHENTHURAM ON FORMALDEHYDE INDUCED ARTHRITIS IN HIND PAW OF RATS**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Changes in paw size (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 day</td>
</tr>
<tr>
<td>Arthritis</td>
<td>0.40 ± 0.03</td>
</tr>
<tr>
<td>Arthritis + drug (200mg/kg)</td>
<td>0.41 ± 0.03</td>
</tr>
<tr>
<td>Arthritis + Nalfon (standard)</td>
<td>0.42 ± 0.02</td>
</tr>
</tbody>
</table>
Values are expressed as mean ± SEM of 5 rats. **P<0.01; *P<0.05 Vs arthritis group.

**Interference:** The drug (Rasapralaya Chenthuram) showed moderate antiarthritic effect.

**NAVANATHA SIDHAR THYLAM**

**ACUTE ANTI-INFLAMMATORY ACTIVITY**

**EFFECT OF NAVANATHA SIDDHAR THYLAM ON CARRAGEENAN- INDUCED HIND PAW EDEMA IN RATS**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Paw volume (ml)</th>
<th>Inhibition (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1hr</td>
<td>3hr</td>
</tr>
<tr>
<td>Control (water)</td>
<td>2.22 ± 0.2</td>
<td>5.42 ± 0.4</td>
</tr>
<tr>
<td>Navanatha siddhar thylam</td>
<td>2.65 ± 0.1</td>
<td>3.28 ± 0.2**</td>
</tr>
<tr>
<td>Diclofenac sodium gel (standard)</td>
<td>2.20 ± 0.2</td>
<td>2.01 ± 0.2**</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SEM of 5 rats. **P<0.01 Vs control group.

**Interference:** The drug (Navanatha Siddhar Thylam) showed significant anti-inflammatory effect when applied externally.
To
Dr. S. Sunitha.

In Vitro antimicrobial activity of Rasapralaya chenthuram as screened against bacteria and Yeast strains. The results are depicted in table. In 50, 100 and 150 μl/disc concentration of RPC were exhibited high antimicrobial activity in streptococcus mutans, S. aureus, Klebsilla and Pseudomonas when compared to standard drugs ciprofloxacin.

<table>
<thead>
<tr>
<th>Organism</th>
<th>Standard drug</th>
<th>TEST DRUG (μl/disc)</th>
<th>Zone of Inhibition in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ciprofloxacin 50 mg/disc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strepto. mutans</td>
<td>29.0 mm</td>
<td>13.0 mm</td>
<td>15.0 mm</td>
</tr>
<tr>
<td>Klebsilla</td>
<td>29.0 mm</td>
<td>14.0 mm</td>
<td>16.0 mm</td>
</tr>
<tr>
<td>Staphylo. aureus</td>
<td>33.0 mm</td>
<td>21.0 mm</td>
<td>27.0 mm</td>
</tr>
<tr>
<td>Pseudomonas aeroginosa</td>
<td>29.0 mm</td>
<td>14.0 mm</td>
<td>17.0 mm</td>
</tr>
</tbody>
</table>
ANTIMICROBIAL ACTIVITY OF RASAPRALAYA CHENTHURAM

The tested microorganisms

The strain used in this work was *Staphylococcus aureus, Streptococcus mutans, Pseudomonas aeruginos and Klebsiella* were provided from the Culture Stock. The bacteria was maintained by weekly transfer in a chemically defined medium and tryptic soy broth (TSB) and distributed in 5ml volumes in screw-capped tubes. Cells were grown at 37°C for 48h and cultures were kept at 4°C.

Method:

The antibacterial action of the *RPC* was tested on the test bacteria using the agar-gel diffusion inhibition test. In the agar-gel diffusion inhibition test 0.2ml of a 24h broth culture (10^6 cfu/ml) of the bacteria was aseptically introduced and evenly spread using bent sterile glass rod on the surface of gelled sterile Mueller-Hinton agar plates. Four wells of about 4.0mm diameter were aseptically punched on agar-plate using a sterile cork borer allowing at least 30mm between adjacent wells and between peripheral wells and the edge of the petri dish. Fixed volumes (0.1ml) of the *RPC* in different concentration like 50 µl, 100 µl, 150 µl were then introduced into the wells in the plates. A control well was loaded with 0.1ml of the solvent. The plates incubated at 37°C for 24h for the test bacteria. The plates were duplicated in all the experiments.
Results and discussion:

The RPC exhibited highly sensitive against staphylococcus aureus, Streptococcus mutans, Pseudomonas and Klebsilla microorganisms used in the study from the zone of inhibition produced by the RPC. None of the negative control exhibited anti microbial activity but when it compared with Ciprofloxacin it doesn’t exhibited highly sensitive. The solvent used for solubilisation of drug had no anti microbial activity.

Thus it is confirmed that the RPC exhibited antimicrobial activity against above four organisms. Higher diameter zones of inhibition (30 mm) was obtained on the test organism Staphylococcus aureus.

References:


OVERALL IMPROVEMENT TABLE FOR OUT PATIENTS:

<table>
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<tr>
<th>S.No</th>
<th>Op. No</th>
<th>Age/Sex</th>
<th>Date of Treatment Starting</th>
<th>End of The Treatment</th>
<th>Improvement</th>
<th>Duration of illness</th>
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<tr>
<td>1.</td>
<td>A.L.9173</td>
<td>37/F</td>
<td>09.08.08</td>
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<td>Good</td>
<td>3 month</td>
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<td>A.L.8950</td>
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<td>3.</td>
<td>A.m.48</td>
<td>55/F</td>
<td>13.08.08</td>
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<td>&gt; 1 yr</td>
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<td>4.</td>
<td>A.m.732</td>
<td>29/F</td>
<td>18.08.08</td>
<td>08.09.09</td>
<td>Mild</td>
<td>&gt; 1 yr</td>
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<td>5.</td>
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<td>42/F</td>
<td>11.09.08</td>
<td>02.10.08</td>
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<td>&gt; 6 month</td>
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<td>6.</td>
<td>A.K.271</td>
<td>39/F</td>
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<td>W.368</td>
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<td>8.</td>
<td>A.m.22</td>
<td>38/F</td>
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<td>Good</td>
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<tr>
<td>9.</td>
<td>A.m.777</td>
<td>33/F</td>
<td>17.08.08</td>
<td>09.09.09</td>
<td>Good</td>
<td>&gt; 6 month</td>
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<tr>
<td>10.</td>
<td>A.m.825</td>
<td>29/F</td>
<td>17.08.08</td>
<td>09.09.08</td>
<td>Good</td>
<td>&gt; 6 month</td>
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<td>11.</td>
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<td>38/F</td>
<td>10.9.08</td>
<td>02.10.08</td>
<td>Moderate</td>
<td>8 month</td>
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<td>12.</td>
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<td>29.09.08</td>
<td>Moderate</td>
<td>3 month</td>
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<td>13.</td>
<td>O.5893</td>
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<td>11.09.08</td>
<td>03.10.08</td>
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<td>6 month</td>
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<td>14.</td>
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<td>24.09.08</td>
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<td>&gt; 3 month</td>
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<td>13.10.08</td>
<td>04.10.08</td>
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<td>1 1/2 yr</td>
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<td>55/M</td>
<td>04.10.08</td>
<td>25.10.08</td>
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<td>1 yr</td>
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<td>A.m.191</td>
<td>48/M</td>
<td>14.08.08</td>
<td>05.09.08</td>
<td>Good</td>
<td>&gt; 6 month</td>
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<td>A.N.1150</td>
<td>38/F</td>
<td>10.10.08</td>
<td>01.11.08</td>
<td>Moderate</td>
<td>4 month</td>
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<td>A.N.4353</td>
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<td>02.11.08</td>
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<td>5 month</td>
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<td>32/F</td>
<td>22.10.08</td>
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<td>8 month</td>
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OVERALL IMPROVEMENT FOR IN PATIENT DEPARTMENT:

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<th>IP No</th>
<th>Age/S ex</th>
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Ayothidhasar Pandithar Hospital, National Institute of Siddha, Tambaram sanatorium.

IN PATIENTS SEROLOGICAL IMPROVEMENT REPORT:

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TABLE ILLUSTRATES THE IMPROVEMENT OF HEAMOGLOBIN & ESR:

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AN OPEN TRIAL OF SIDDHA DRUGS RASAPRALAYA CHENTHURAM AND NAVANATHA SIDDHAR THYLAM FOR THE TREATMENT OF UTHIRAVATHA SURONITHAM (RHEUMATOID ARTHRITIS)

BY

Dr.S.SUNITHA

FORM I – SELECTION PROFORMA/CASE SHEET

1. OP/IP No: __________  2. BED NO: ____________  3. SI.NO: __________

4. NAME: ______________

5. AGE (YEARS) [ ]  6. GENDER: M [ ]  F [ ]

7. OCCUPATION: ______________

8. INCOME: ______________

9. ADDRESS: ______________

........................................
........................................

10. DATE OF ADMISSION: ______________

11. DATE OF DISCHARGE: ______________

12. COMPLAINTS AND DURATION: __________________________________________

........................................
........................................

13. HISTORY OF PRESENT ILLNESS: __________________________________________

........................................
........................................

14. PAST HISTORY: __________________________________________________________

........................................
........................................

15. MENSTRUAL HISTORY (If applicable): __________________________________________

........................................
........................................
16. Family history: 1. No [ ] 2. Yes [ ] If any: ---------------------

17. Socio economical status: 1. Low [ ] 2. Middle [ ] 3. Upper [ ]

18. Habits: 1. Yes [ ] 2. No [ ]
1. Betel nut chewer: [ ] [ ]
2. Alcoholic: [ ] [ ]
3. Smoker: [ ] [ ]
4. Drug addiction: [ ] [ ]
5. Food habits: V [ ] NV [ ] M [ ]

19. GENERAL EXAMINATION:
1. Body weight (kg): [ ] [ ] [ ]
2. Temperature (°F): [ ] [ ] [ ] [ ]
3. Pulse rate / minute: [ ] [ ]
4. Heart rate / minute: [ ] [ ]
5. Respiratory rate / minute: [ ] [ ]
6. Blood pressure (mmHg): [ ] [ ] / [ ] [ ]
7. Pallor: [ ] [ ]
8. Jaundice: [ ] [ ]
9. Cyanosis: [ ] [ ]
10. Lymphadenopathy: [ ] [ ]
11. Pedal edema: [ ] [ ]
12. Clubbing: 

13. Jugular venous pulsation: 

20. VITAL ORGANS EXAMINATION:

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<td>6. Stomach</td>
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21. CLINICAL EXAMINATION:

I. INSPECTION:

1. Attitude: Normal | Affected

2. Muscle spasm: Present | Absent

3. Muscle wasting of the upper limbs: 

4. If yes, Proximal
   Distal

5. Joint swelling: Major joints
   Minor joints

6. Skin over the joints: Normal | Reddish
7. Muscle wasting of the lower limbs:  

8. Nodules:  

9. Deformities:  

1. Swan neck deformity:  
   1. Yes  
   2. No  

2. Button hole deformity:  
   1. Yes  
   2. No  

3. Z Shaped thumb  
   1. Yes  
   2. No  

4. Ulnar deviation of hand  
   1. Yes  
   2. No  

5. Ulnar deviation of foot  
   1. Yes  
   2. No  

6. Hallus valgus  
   1. Yes  
   2. No  

II. PALPATION:  

   Present  Absent  

1. Tenderness  

2. Muscle spasm  

3. Local heat  

4. Local Lymphadenopathy:  

5. Pitting edema:  

6. Joint stiffness  

7. Nodules:  

III. MOVEMENTS:  

1. Pain:  
   i. Onset:  
      Sudden  
      Gradual  

   ii. Early morning stiffness:  
      Present  
      Absent
iii. Nature of pain: Mild ☐ Moderate ☐ Severe ☐

iv. Aggravating factor – Movement: Yes ☐ No ☐

v. Relieving factor – Rest: Yes ☐ No ☐

vi. Stiffness: Yes ☐ No ☐

vii. Tenderness: Yes ☐ No ☐

2. Restriction: Fully ☐ Partial ☐ No ☐
   A. Neck:
   B. Shoulder joints:
   C. Elbow joints:
   D. Knee joints:
   E. Ankle joints:
   F. Phalangeal joints:
   I. Hip joints:

3. Grading of function:
   Grade I ☐ Grade II ☐ Grade III ☐ Grade IV ☐

4. Excess mobility: Yes ☐ No ☐

22. CLINICAL FEATURES:
   Yes ☐ No ☐
   1. Arthritis and soft tissue swelling of three or more joints present for at least 6 weeks
   2. Arthritis of hand joints present for at least 6 weeks
   3. Morning stiffness > 1 hr
   4. Symmetrical arthritis
5. Restricted movements
6. Spindled appearance of fingers
7. Anemia
8. Anorexia
9. Low grade fever
10. Sub cutaneous nodules in specific places
11. Broadening of the forefoot

23. AUTONOMIC NERVOUS SYSTEM:

<table>
<thead>
<tr>
<th>Normal</th>
<th>Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bladder</td>
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</tr>
<tr>
<td>Bowel</td>
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</table>

24. SIDDHA SYSTEM OF EXAMINATION:

1. Nilam:
   1. Kurinji  
   2. Mullai  
   3. Marutham  
   4. Neithal  
   5. Palai  

2. Kaala Iyalbu:
   1. Kaarkaalam  
   2. Koothirkaalam  
   3. Munpanikaalam  
   4. Pinpanikaalam  
   5. Ilavenilkaalam  
   6. Muduvenirkaalam  

3. Yaakkai:
   1. Vali  
   2. Azhal  
   3. Iyyam  
   4. Valiazhal  
   5. Valiyyam  
   6. Azhalvali  
   7. Azhaliyam  
   8. Iyavali  
   9. Iyaazhal  

4. Gunam:
   1. Sathuva gunam  
   2. Rajo gunam  
   3. Thamo gunam  

5. Poripulangal:

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<td>Sevi</td>
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6. Kanmenthirium:

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7. Uyir Thathukkal:

A. Vali:

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9. Envagai Thervukal:

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<td>iii. Thanmai:</td>
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<td>6. Moothiram:</td>
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<td>iii. Manam</td>
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<td>iv. Nurai</td>
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<td>v. Enjal</td>
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<td>7. Naadi:</td>
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</tbody>
</table>
25. INVESTIGATION:
A. Blood:

1. TC (cells /cumm):

2. DC (%):
   1. P
   2. L
   3. E
   4. B
   5. M

3. Hb (gms %):

4. ESR (mm/hr):
   1. 1/2hr
   2. 1hr

5. Blood Sugar (R) (mg %):

6. Blood Urea (mg %):

7. Serum Creatinine (mg %):

8. Serum Cholesterol (mg %):

9. Triglycerides (mg %):

10. Total Bilirubin

11. Direct Bilirubin

12. Indirect Bilirubin

10. SGOT

11. SGPT

12. Alkaline phosphatase

13. ASO titer
   1. Positive
   2. Negative

14. CRP
   1. Positive
   2. Negative

15. RA Factor
   1. Positive
   2. Negative

16. VDRL
   1. Positive
   2. Negative
B. Urine:

1. Albumin: 1. Present  □  2. Absent □
2. Sugar: 1. Present  □  2. Absent □
3. Deposit: 1. Yes □  2. No □
   i. Pus cells □ □
   ii. Epithelial cells □ □
   iii. RBC □ □
   iv. Crystals □ □

C. Motion:

1. Yes □  2. No □
   i. Ova □ □
   ii. Cyst □ □
   iii. Occult blood □ □

26. INCLUSION CRITERIA:

<table>
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<tr>
<th>Criteria</th>
<th>Yes</th>
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<tbody>
<tr>
<td>1. Age between 25 to 55 yrs</td>
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<tr>
<td>2. Arthritis of three or more joints</td>
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<td>3. Arthritis of hand joints:</td>
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<td>4. Morning stiffness &gt; 1 hr</td>
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<td>5. Symmetrical arthritis</td>
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<tr>
<td>6. Restricted movements</td>
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<td></td>
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<tr>
<td>7. Sub cutaneous nodules in specific places</td>
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</table>
8. Spindled appearance of fingers
9. Fever
10. Anemia
11. Anorexia
12. Broadening of the forefoot
13. RA Factor positive

27. EXCLUSION CRITERIA:

Yes | No
---|---
1. Cardiac disease
2. Hypertension
3. Use of narcotics
4. Pregnancy
5. Lactation
6. Other joint diseases
7. History of trauma
8. Diabetic mellitus
9. Neurological disorder

28. ADMITTED TO TRIAL: 1. Yes 2. No

29. If yes

1. I.P / O.P 1. I.P 2. O.P
2. IP/ OP No
30. Drug issued for OP/ IP patient

Rasapralaya chenthuram (mg):

Thirikaduku chooranam (g):

Navanatha siddhar thylam (ml):

Station:

Date:  
Signature of Medical Officer:

Signature of HOD:
AN OPEN TRIAL OF SIDDHA DRUGS RASAPRALAYA CHENTHURAM AND NAVANATHA SIDDHAR THYLAM FOR THE TREATMENT OF UTHRIRAVATHA SURONITHAM (RHEUMATOID ARTHRITIS)

BY
Dr.S.SUNITHA

FORM II – ASSESSMENT PROFORMA


7. Address: _________________________  8. Occupation: _______________

9. Date of admission:  10. Date of discharge:

I. INSPECTION:

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<tr>
<th>Present</th>
<th>Absent</th>
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<tr>
<td>1. Attitude:</td>
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<tr>
<td>2. Muscular spasm</td>
<td></td>
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<tr>
<td>3. Muscle wasting – proximal</td>
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<tr>
<td>4. Muscle wasting – distal</td>
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<td>5. Major joint swelling</td>
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<td>6. Minor joint swelling</td>
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<td>7. Nodules</td>
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<tr>
<td>8. Deformity</td>
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<td>9. Skin over the joints</td>
<td>Normal</td>
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## II. PALPATION:

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<tr>
<td>1. Swelling</td>
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<tr>
<td>2. Tenderness</td>
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<td>3. Joint stiffness</td>
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<td>☐</td>
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<tr>
<td>4. Muscle wasting</td>
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<tr>
<td>5. Local heat</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>6. Local lymphadenopathy</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>7. Pitting edema</td>
<td>☐</td>
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<tr>
<td>8. Nodules</td>
<td>☐</td>
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</tbody>
</table>

## III. MOVEMENTS:

1. Restriction of joint movements:  
   - Yes ☐ No ☐  
     
     i. Neck  
     - Full ☐ Partial ☐  
     
     ii. Shoulder joints  
     - Full ☐ Partial ☐  
     
     iii. Elbow joints  
     - Full ☐ Partial ☐  
     
     iv. Knee joints  
     - Full ☐ Partial ☐  
     
     v. Ankle joints  
     - Full ☐ Partial ☐  
     
     vi. Hip joints  
     - Full ☐ Partial ☐  
     
     vii. Minor joints  
     - Full ☐ Partial ☐  
   
2. Excess mobility:  
   - Yes ☐ No ☐  
3. Pain  
   - Yes ☐ No ☐
IV. PAIN:

i. Onset
   Sudden ☐ Gradual ☐

ii. Early morning stiffness
    Present ☐ Absent ☐

iii. Nature of pain
     Mild ☐ Moderate ☐ Severe ☐

iv. Aggravating factor – Movements
    Yes ☐ No ☐

v. Relieving factor – Rest
    Yes ☐ No ☐

vi. Stiffness
    Yes ☐ No ☐

V. CLINICAL ASSESSMENTS:

1. Arthritis and soft tissue swelling of three or more joints at least 6 weeks
   Yes ☐ No ☐

2. Arthritis of hand joints at least 6 weeks
   Yes ☐ No ☐

3. Morning stiffness > 1 hr
   Yes ☐ No ☐

4. Symmetrical arthritis
   Yes ☐ No ☐

5. Restricted movements
   Yes ☐ No ☐

6. Spindled appearance of fingers
   Yes ☐ No ☐

7. Rheumatoid nodules
   Yes ☐ No ☐

8. Fever
   Yes ☐ No ☐

9. Anemia
   Yes ☐ No ☐

10. Anorexia
    Yes ☐ No ☐

11. Broadening of forefoot
    Yes ☐ No ☐
8. RESULT:
4. No improvement ☐

9. INVESTIGATION:

A. BLOOD:
1. TC (cells /cumm):
3. Hb (gms %):
4. ESR (mm/hr):  1. 1/2hr  2.1hr
5. Blood Sugar (R) (mg %):
6. Blood Urea (mg %):
7. Serum Creatinine (mg %):
8. Serum Cholesterol (mg %):
9. Triglycerides (mg %)
10. Serum total billirubin
11. Direct billirubin
12. Indirect billirubin
13. SGOT
14. SGPT
15. Alkaline phosphatase
16. Total protein
17. Albumin
18. Globulin
19. CRP  
   1. Positive  
   2. Negative 
20. RA Factor  
   1. Positive  
   2. Negative 

**B. URINE:**

1. Albumin: Present  
   Nil  
   Nil
2. Sugar: Present  
   Nil  
   Nil
3. Deposit:  
   1. Yes  
   2. No  
   i. Pus cells  
   ii. Epithelial cells
   iii. RBC
   iv. Crystals

13. Date: ____________________

14. Station: ________________  
15. Signature of Doctor: ________________

16. Signature of HOD: ________________
# LAB INVESTIGATIONS CHART

<table>
<thead>
<tr>
<th>S.NO</th>
<th>INVESTIGATIONS</th>
<th>DATE OF ADMISSION</th>
<th>DATE OF DISCHARGE</th>
</tr>
</thead>
</table>

## I. BLOOD:

1. TC (Cells/ Cumm)
2. DC (%)
3. ESR (mm): ½ hr & 1 hr
4. Hb (gm %)
5. Blood sugar (mg %)
   - Fasting:
   - Postprandial:
6. Serum cholesterol
7. Serum Trigliceride
8. Serum Total Bilirubin
9. Serum Indirect Bilirubin
10. Serum Direct Bilirubin
11. Alkaline phosphatase
12. SGOT
13. SGPT
14. Serum Creatinine
15. Blood Urea
16. Total Protein
17. Albumin
18. Globulin
19. Calcium

**Special Investigations:**

20. ASO Titre
21. RA Factor (Dilution)
22. CRP

## II. URINE:

- Albumin
- Sugar
- Deposits:
  - Epithelial cells:
  - Pus cells
  - Red blood cells:
  - Cast/ Crystals:

## III. NEIKURI:
**FORM III – PATIENTS DAILY PROGRESS CHART**

1. **OP/IP NO:**  
2. **Bed no:**  
3. **Sl. No:**  
4. **Name:**  
5. **Age:**  
6. **Gender:**  
7. **Date of Admission:**  
8. **Date of Purgation:**  
9. **Date of Discharge:**

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<th>Pain in major jts</th>
<th>Swelling in smaller jts</th>
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<th>Symmetrical involvement</th>
<th>Restricted movement</th>
<th>Stiffness + after rest</th>
<th>Morning stiffness</th>
<th>Loss of appetite</th>
<th>Tenderness</th>
<th>Sleeplessness</th>
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<th>Neikari</th>
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**Lecturer**

**HOD**
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<th>Restricted movement</th>
<th>Stiffness + after rest</th>
<th>morning Stiffness</th>
<th>Loss of appetite</th>
<th>Tenderness</th>
<th>Sleeplessness</th>
<th>Naadi</th>
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A PILOT OPEN CLINICAL TRIAL OF SIDDHA DRUGS RASAPRALAYA CHENTHURAM AND NAVANATHA SIDDHAR THYLAM IN THE TREATMENT OF UTHIRAVATHA SURONITHAM (RHEUMATOID ARTHRITIS)

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: ______________
Name: ______________

Consent of 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 opt out of 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 subject in the clinical trial of Rasapralaya chenthuram and Navanatha siddhar thylam for the management of Uthiravatha suronitham (Rheumatoid arthritis).

Date: ______________  Signature: ______________
Name: ______________

Date: ______________  Signature of witness: ______________
Name: ______________
Relationship: ______________
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- Agathiyar Vaithya Kaaviyam 1500.
- Agathiyar Ayul Vedham.
- Agathiyar Vaithya Vallathy 600.
- Agathiyar Vaithya Sathagam.
- Theraiyar Yamaga Venba.
- Theraiyar Kaapiyam.
- Theraiyar Vaagadam.
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