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## INTRODUCTION

“கற்ற குருவாக்குங் காதலித்த வாகடமும்  
பற்றுக் கேரலென்றே பரிகாரம் - முற்ற  
அவன் பெற்றுப்பல்லா லென்றே மாவதில்லையென்றே  
இவனுணரக் கீர்த்தி இங்கு”

- நோய் நாடல் நோய் முதனாடல் பாகம்

India, the land of "Unity in Diversity" popular not only for its tradition, heritage and culture but also famous for its own traditional system of medicine called "Indigenous System of Medicine". Indigenous system of medicine includes siddha, Ayurvedha, Unani Among these, **siddha** system of medicine is the ancient one, it was believed to be originated from Lord shiva, and then reached from Agasthiar to Siddhars. From, siddhars this system of medicine was gifted to mankind.

Siddhars, they are not only physicians, but also social reformers, saints solved the human problems by their super natural power called siddhi one who achieved, siddhi is called "Siddhar". The ultimate aim of siddhars is to attain eternal bliss. For attaining eternal bliss human body is considered to be media. This media must be protected from degeneration, ageing and disease. So the siddhars followed specific type of life style and dietary style, which was also included in this system of medicine.

According to siddhars human body is constituted by five basic elements which also constituted the environment viz Nilam (Earth), Thee (Fire), Vayu (Air), Neer (Water) and Aahayam (Ether). The normal functioning body without being affected by any disease and of maintain sound wind which are called karpamuraigal.

“உடம்பர் அழியின் உயிரர் அழிவர்  
திடம்பட மெய்ஞானம் சேரவும் மட்டர்  
உடம்பை வளர்க்கும் உபாயம் அறிந்தே  
உடம்பை வளர்த்தேன் உயிர் வளர்த்தேனே”

- திருமூலர் திருமந்திரம்

"Medicine" is defined as one which removes distress and leads an individual to perfect happiness (heavenly bliss).

“வேர்பாரு தலைபாரு மிஞ்சினக்கால் மெல்ல மெல்ல  
பற்ப செந்தூரம் பாரே”

- அகத்தியர் வைத்தியம் பின் எண்பது

பதினெண் சித்தர் பாடிய சில்லறைக் கோவை

The medicament with roots and leafs of the herbs are initiated, if uncontrolled then parpam and chendoorams are to be used.

Among the various types of **KEELVAYU** disease, the Author has selected the "**AZHAL KEELVAYU**" for her research subject.

According to this study, "**AZHAL KEELVAYU**" is correlated with "Arthritis" mentioned in modern medicine.

Arthritis means ever increasing pain and stiffness with ever decreasing physical competence, bodily joy and ease. When more than one joint involved it is known as "Oligo Arthritis" and "Poly Arthritis".

Thorough knowledge of important aspects of this disease in siddha and modern concepts namely the aetiology, pathology, sympatmatology and biochemical mechanisms will be helpful to conduct the study with perfect understanding.

The Author has selected "NANNARIVER CHOORNAM" and "SANGANKUPPIVER ENNAI" as medication for research. The reason for choosing above medicines is their efficacy mentioned in siddha therapeutics and the easily available ingredients.

The Author believe that the dissertation work might of human body is based on homeostasis of three vital forces or "UYIR THATHUKKAL" called vatha, pitha, and kapha. Any derangement in this notneostaste leads to pathological condition called "Pini" or "Noi".

“நோய் நாடி நோய் முதல்நாடி அதுதணிக்கும்  
வாய் நாடி வாய்ப்பச்ச செயல்”

- திருக்குறள்

The Factors, which maintain constant homeostasis of these three humors are by six tastes (Arusuvai), life style dietary habits, etc.

“மருந்தென வேண்டாவாம் யாக்கைக்கு அருந்தியது  
அற்றது போற்றியுண்ணின்”.

- திருக்குறள்

Siddhars classified the diseases in to 4448 types. Siddhars the diseases by means of Envagai thervu, which includes Nadi etc, Neerkuri, and Neikuri, the "Precise diagnostic tool" of siddhars. The treatment aspect involves the neutralisation of affected humours.

“விரேசனத்தால் வாதம்”  
“வமனத்தால் பித்தம் தாமும்”  
“நசிய அஞ்சனத்தால் கபம் தாமும்”

- நோய்நாடல் நோய் முதனாடல் பாகம்

By giving viresanam (Purgatives), Vatha Kutram is neutralized. By giving vamanam (emetics), pitha kutram is neutralised. Kapha kutram is neutralised by giving Anjana and Nasiyam (application of medicine in the eyes as well as nose). The selection of medicines was based on suvai, veerium, and

vibagam, related to diseased condition.

The advantage and unique features of siddha medicine is the removal of the root cause of the disease and effect, perfect remedy for mind and soul. Siddhars have enumerated ways that are to be followed to maintain the arise new horizons in this field especially in the treatment of

**“AZHAL KEEL VAYU”**

“உற்றவன் தீர்ப்பான் மருந்துழைச் செல்வனென்  
ஓப்பானாற் கூற்றே மருந்து”.

- திருக்குறள்

When patient, doctor, pharmacist and nurse all act in co-ordination the disease will be cured.

**Sirappu Maruthuvam:**

Sirappu Maruthuvam is a branch of medicine which deals with the bodily disorders and to increase the longevity of human lifespan by preventing diseases. It relieves mental tension and depression and gives peace.

This is achieved by following techniques.

1. Yoga and kayakalpam
2. Rejuvenation Therapy.
3. Muppu
4. Varmam, thokkanam and enbu murivu
5. Kirigai and Kanma Noi
6. Dermatological disorders.

## AIM AND OBJECTIVES

The disease “Azhal Keel Vayu” is a major ailment of the elderly. This produces pain and discomfort to the patients. The purpose of author’s work is to elucidate a good medicine from ancient Siddha literatures and to create hope and faith in their treatment. Their being a preliminary endeavour by the author, as if it would be a helping hand to the sufferers. With this view this dissertation subject was undertaken.

1. To prove the efficacy of our Siddha Medicine to the world.
2. To study the clinical cause of the disease “Azhal Keel Vayu” with keen observation on the Aetiology, Pathology, Diagnosis, Prognosis, Complications and the Treatment by making use of Siddha aspect.
3. To expose the unique diagnostic methods mentioned by Siddhars, to know the disease “Azhal Keel Vayu” alters the normal condition under the topic Mukkutram, Poripulangal, Ezhu Udal Kattukkal and Envagai thervugal.
4. To know the extent of correlation of Aetiology, Classification, Signs and Symptoms of Azhal Keel Vayu in Siddha aspect with Osteo arthritis in Modern medicine.
5. To have an idea about the incidence of the disease with age, sex, socio-economic status and climatic conditions.
6. To have a detailed clinical investigations.
7. To have a clinical trial on Azhal Keel Vayu with the medicines named **NANNARIVER CHOORNAM** as internal medicine and **SANGANKUPPI VER ENNAI** as external medicine.
8. To evaluate the Bio-chemical and Pharmacological effects of trial medicine.

9. To use modern parameters to confirm the diagnosis and prognosis of the disease.
10. To insist Thokkanam (Massage) and Asanas along with medicines to achieve the good results, which are the salient features of **Sirappu Maruthuvam**.



## SIDDHA LITERATURE

“அண்டத்தில் உள்ளதே பிண்டம்  
பிண்டத்தில் உள்ளதே அண்டம்  
அண்டமும் பிண்டமும் ஒன்றே  
அறிந்து தான் பரங்கும்போதே”

- சட்டமுனி ஞானம்.

Siddhars spiritual scientists explored and explained the reality of nature and its relationship to man by their yogic awareness. According to siddha philosophy, man is nothing but a miniature world containing the five basic elements.

Universe originally consisted of atoms which contributed to the five basic elements (Pancha boothas) namely, earth, water, fire, air and ether which correspond to the five senses of the human body and they were the fundamentals of all human body and all corporal things.

Panchaboothas are the foundations for Thridosha (Vatham, Pitham and Kabham) which are the pillars that support our body structure.

Any alterations in the level of thridosha effects the normal functions of the body. This is obvious from the verses.

“மிகினும் குறையினும் நோய் செய்யும் நூலோந்  
வளிமுதலா வெண்ணிய மூன்று

- திருக்குறள் - மருந்து

The normal values of the Thridosha are in the ratio Vatham, Pitham and Kabham 1:1/2:1/4

“வழுங்கிய வாதம் மரத்திரை யொன்றாகில்  
தழுங்கிய பித்தந் தன்னிலரை வரசி  
அழுங்குங் கபந்தாடைங்கியே காலோடில்  
பிறங்கிய சீவர்க்குப் பிசுகொன்றுமில்லையே”

- குணவாகடம்.

Alterations in this ratio, produces disease. The signs and symptoms are produced according to the particular deranged dosha.

## KEEL VAYU

### Synonyms:

Keel vayu, mottuvali, santhuvali, mudakkuvatham, ama vatham, mega soolai.

The term Keelvayu is mentioned in the text Siddha maruthuvam according to Sabapathy manuscript. It is denoted as ‘santhu vatham in the literature Yugi Vaidya Sinthamani. In Yakobu Vidya Sinthamani it is mentioned as “Mudakku vatha soolai”. In Thanvanthri Vaidya Kaviyam it is said as mudakku vatham”.

Keel vayu is the general term that includes all kinds of joint diseases. The word “keel” means “Joint” and “Vayu” means “Vatham”

The principal deranged factor among thridhosa is the vatham and so called as keel vayu.

Restriction of movements and in some cases even immobility of the joint can occur. So it is called as “mudakku vatham”.

### வாத வியாதிகளின் விபரம்:

“வரித்திடு வாதபித்த சிலேத்தும வியாதி முன்றில்  
வருத்திடுஞ் சிலதோஷத்தால் வண்மை முன்  
நுரைத்திடு மீரேழ்நூறே தன்னிலைண்பத்திரண்டு  
கடுத்தினால் வாதக்கூறின் நோயெனக் கருதலாமே”

- அகத்தியர் 2000.

From the above text it is clear that vatha diseases are 1482.

## EYAL – (DEFINITION)

Keel vayu is a vatha disease characterized by pain and swelling of the joints, stiffness of the muscles and joints with tenderness, frequently associated with fever, anorexia and insomnia. It may be accompanied by emaciation, anaemia and restriction of joint movements and in some cases even immobility may occur.

### வாத இயல்பு:

“என்னவே வாதம் தளெண்பதற்கும்  
இகத்திதே மனிதர்களுக் கெய்யுமற்று  
பின்னவே பொன்தனையே சேரஞ்செய்து  
பெரியோர்கள் பிரமணரை தூஷணித்தும்  
வன்னதேவற் சொத்திச் சேரஞ் செய்து  
மாதாபிதாசுருவை மறந்த பேர்க்கும்  
கன்னவே வேதத்தை நிந்தை செய்தால்  
காயத்திற் கலந்திடுமே வாதந்தானே.”

“தளென்ற கசப்போடு துவர்ப்புறைப்பு  
சாதகமாய் நெஞ்சுகினுஞ் சமைத்த வன்னம்  
ஆனென்ற வானினது பொசித்தலாலும்  
ஆகாயத் தேறலது குடித்தலாலும்  
பளென்ற பகலுரக்க மிரா விழிப்பு  
பட்டினியே மகவிறுத்தல் பாரமெய்தல்  
தேனென்ற மொழியாள்மேற் சிந்தையாதல்  
சீக்கிரமாய் வாதமது செனிக்குந்தானே.”

- யுகிவைத்திய சிந்தாமணி

### வாதரோகம்:

“அம்புவியில் வாதநோய் வருகும் நேர்மை  
அப்பனே சொல்லுகிறே னறிவாய்க் கேளு  
தெம்புடனே ஓரிடத்திலேனு மப்பா  
தெளிவாகப் பலவிடத்திலேறு மப்பா  
சம்பிரமமாய்ப் பரிசு நரம்பிலேறு  
சதிரான சலன நரம்பிலேறுமப்பா  
கம்பிதமாய் யிரண்டு மில்லாமற் போனால்  
கடிதான ஸ்தம்பன ரோக மென்றே சொல்வார்”.

“சொல்லுவார் பரிசும் சலனமு மப்பா  
சுயங்கெட்டுப் போயிருந்தால் பூரணமே யென்றும்  
அல்லுவா ரேதேனு மென்றே கெட்டால்  
அபூரணமென்றே யதற்குப் பேராம்

வெல்லுவார் அசைவற்றுப் போவதற்கும்  
விரைவான ஸ்பரிசு மற்றுப் போவதற்கும்  
தொல்லை செய்யுஞ் திமிர்வாதமென்று சொல்வார்  
தொல்லுலகில் இன்னும் வெகு வாதமுண்டே.”

- அகத்தியர் குணவாகடம்

### வாதத்தின் குணங்கள்:

“வாதத்தின் குணமெதென்னில் மயங்குஞ் தியங்கும் மலர் சிவக்கும்  
பாதங்குளிர்ந்து சருவாங்கம் பற்றி நடக்கு முகங்கடுக்குஞ்  
சீதத்துடனே வயிற்று புண்ணாஞ் சிரிப்பித்ததுந் தெறி மூச்சாம்  
போதத்தண்ணீர் தான் வரங்கும் புகழும் பஞ்ச குணமாமே.”

“வாதத்தின் குணத்தைக் கேண்மின் வயிறூதும் பொருமிக் கொள்ளும்  
தாதுற்றவுடம்பு கைகால் சந்துகள் கடுப்புத் தோணும்  
தீதுற்ற சிறுநீர் தானுஞ் சிவந்துடல் கடுத்து வீழும்  
போதுற்ற வுப்புசமாய் போதவும் பசித்திடாதே.”

“கால் கை கடுக்குந் திமிருண்டாங் கண்ணுஞ் தூங்கிச் சோபிக்கும்  
கோலஞ்செரியு மங்கமெல்லாங் குளிர்ந்த சந்துகனங்கொள்ளுஞ்  
சீலமிகுந்து சீர்காணில் சிறுநீர் வற்றி வருமிகவே  
மாலத்தடங்கண் மானனையாய் மாதே வாதரோகமிதே.”

- அகத்தியர் 2000.

**வாதரோக லட்சணம்:**

“கால் கையுலர்ந்து திமிருண்டாம் கண்ணுந் தூங்கிச் சோபித்துக்  
கோலஞ்செரியு மங்கமெல்லாங் குதித்துச் சற்றே கனங்கொண்டு  
சீலமிகுந்து சீர்காணச் சிறுநீர் வற்றி முடுகு மென்ன  
வாலத்தடங்கண் மானனையாய் மாதே வாத ரோகமிதே.”

- அகத்தியர் 2000

**வாத சரீரக் கூறு (வாதப்பிரகிருதி)**

“உத்ததொரு காரியத்தை மெத்தெனவும் பேசலுள்ள  
தெல்லாங் கருத்தாக வுரைப்பதல்லாங்  
மெத்தவரும் பொய்யை மெய்யாய் வியந்துரைத்தல்  
கனவினால் மெய் வருத்தல் காணல்  
சத்துமனஞ் சலித்திருத்தல் தண்புனலை  
விரும்பாதே தழலை வேண்டல்  
மத்துமுடல் தூலமாய் யிருக்கு மாகில்  
வாத குணமிதுவெனவே வகுக்கலாமே”.

- அகத்தியர் 2000

**வாதம் வர்த்திக்குங் காலம்**

“வாத வர்த்தனை காலமே தேர வென்னில்  
மருவுகின்ற வானிகர் கடகமாகும்  
ஆதலைப் பசியோடு கார்த்தி தன்னில்  
அடருமே மற்ற மாதங்கள் தன்னில்  
போதவே சமிக்குகின்ற காலமாகும்  
பொருந்தியே யிவர் தொழில் நான் கண்திறத்தல்  
காதவே கண்முடல் கைகாலசைத்தல்  
கடிந்தோட்ட முடக்கலொடு நீட்டவென்னே.”

- யூகி வைத்திய சிந்தாமணி

## கீல்வாத ரோகம்:

“தானான கீல்வாத ரோகம் பேரை  
சாற்றுுகிறேன் நீயறிய விபரமாக  
மனான வாய்வு ரோகம் வாதரோகம்  
மகத்தான முடக்கு வாய்வு முடக்கு வாதம்  
தேனான சந்திக சிலேட்டும ரோகம்  
தெளிவான கைகளில் பிடிப்பு ரோகம்  
ஊனான ரசவாதம் சூலைக்கட்டு  
உத்தமனே சந்திவாதம் வாதசூலையாமே.”

“ஆமென்ற இத்தனையும் அதற்குப் பேராம்  
அப்பனே இதுநேரும் வரிசை கேளு  
போமே தான் ரச தூஷியத் தினாலே  
பொல்லாத இந்த நொய் காணும் பாரு  
நாமேதான் முழங்கால்கள் பெரிய கீல்கள்  
நன்மையுடன் அதைச்சுற்றி இருக்கும் சவ்வின்  
சீமேவும் சவ்வுக்கு வலிகள் கண்டால்  
சிறப்பாக இந்தநொய்கள் வருகும் பாரே.”

“பாரடா இதிலிரண்டு ஜாதியுண்டு  
பக்குவமாய் தீவிரம் சாத்மீகம் என இரண்டேயாகும்  
கூறுவேன் தீவரத்தின் குணத்தைக் கேளு  
குடிக்கெடுத்த நோயதுதான் மேலே செல்லும்  
நேரடா கைகள்களில் வேதனைதான் கண்டு  
நிச்சயமாய் பிறகு அது அதிகமாகும்  
பேரடா பெரியதொரு முட்டுகள்தான் வீங்கி  
பின்னாபகரம் புண்ணாய் வேதனையுந் செய்யும்”.

“செய்கின்ற சரப்தீகக் கீல்வாத ரோகம்  
 செய்வதனைச் சொல்லுகிறேன் திறமதாக  
 உய்கின்ற பிரமேகந் தன்னாலப்பா  
 உத்தமனே காண்பதுவு முண்டு பாரு  
 நையவே ராத்திரியில் அதிகமாகும்  
 நலமான உஷ்ணவாயு அதனால் தோன்றும்  
 பையவே தற்செயலாய்க் காண்பதுவு முண்டு  
 பணியாக இதில் மூன்று குணங்களுண்டே”.

- அகத்தியர் குணவாகடம்

### **PINI URPATTHI KIRAMAM (AETIOLOGY)**

In siddha system the main cause for this keel vayu is derangement of thrithathu. The derangement occurs under various conditions. They are given below in various headings.

- ❖ Physical factor
- ❖ Mental factor
- ❖ Factor of pitha megam
- ❖ Factor of ama dhosam

#### **I. Physical Factor:**

“தானென்ற கசப்போடு துவர்ப்பு கைப்பு  
 சாதகமாய் மிஞ்சுகினும் சமைத்தவன்மை  
 ஆனென்ற ஆறினது புசித்த லாலும்  
 ஆகாயத் தேறலது குடித்தலாலும்  
 பானென்ற பகலுறக்க மிராவிழிப்பு  
 பட்டினியே மிகவறுதல் பாரமெய்தல்  
 தேனென்ற மொழியாந்மேற்சிந்தையாதல்  
 சீக்கிரமாய் வாதமது செனிக்குந்தானே”

- யூகி சிந்தாமணி

Intake of food item which are excess in bitter, astringent and pungent tastes intake of old cooked food items, drinking rain water, sleeping during day time and awakening at night, undue starving, strain due to excessive weight lifting and sexual perversion.

“பகரவே வாதமது பேரகித்தப்போ

பண்பாக பெண்போகம் அதுதான் செய்யில்

தகரவே வெகுதூர வழி நடக்கில்

நளிரானகற்றுமே பனிமேல் பட்டால்

மிகரவே காய்கள் கனி கிழற்குதன்னை

மிக வருந்தி மீறியே தயிர்தான் கொண்டால்

முகரவே முதுகெலும்பை முறுக்கி நொந்து

முழங்கலும் கணுக்கலும் கடுப்புண்டாகும்”

- யூகி சிந்தாமணி

Indulging in the sexual act during vitiation of vatha, walking for a long distance, exposing to dampness and cold and harmful combinations like taking excessive curd after eating fruits, vegetables and tubers causes toxic factors which affect bones and muscles.

**According to Siddha Maruthuvam Text:**

“வளிதரு காய்கிழங்கு வரைவிலா தயிலல் கோழை

முளிதரு போன்மிகுக்கு முறையிலா உண்டி கோடல்

குளிந்தரு வளியிற் தேகங்குனிப்புற வுலவல் பெண்டிர்

களிதரு மயக்கம் பெற்றோர் கடி செயல் கருவியாமால்”

- சபாபதி கையேடு

Ahara and Vihara (errors of diet and habits) that give rise to vatha vitiation (ie.) excessive intake of certain fruits and roots tend to increase vayu.

Excessive intakes of cold substances or exposure to severe cold, staying in high hills are liable to increase kapham. More sexual indulgence that gives rise to meganoi may also produce keelvayu.



### According to Pararaja Sekaram:

“தொழில் பெறுகைப்புக் களர்த்தல் துவர்த்தல் விஞ்சுகினுஞ்சோறும்  
பழையதாம் வரகு மற்றைப் பைந்திணையருந்தினாலும்  
எழில் பெறப் பகலுறங்கி இரவினிலுறங்காதலாலும்  
மழை நிகர் குழலினாலே வாதங்கேர பிக்குங்கானே”

Intake of foods rich in bitter, pungent and astringent tastes, Day time sleep instead of routine night sleep.

“காணவே மிகவுண்டாலும் கருதுபட்டினி விட்டாலும்  
மானனை யார்கண் மேகமறக்கினு மிகுந்திட்டாலும்  
ஆணவ மலங்கடம்மை யங்கனே விடாதலாலும்  
வானுதன் தடநல் லாளேவாதங் கோபிக்கும் காணே”

Over eating, undue starving, high sexual tendency, will lead to increased vatham.

“பாநிநிற் பயப்பட்டாலும் பலருடன் கோபித்தாலும்  
காரெனக் கருகியோடிக் கழுமரத் துரத்தினாலும்  
ஏன்பெறு தனது நெஞ்சின் மிகத்துக்க மடைந்திட்டாலும்  
பாநிய கற்றினாலும் படரினும் வாதங்காணும்”

Anxiety, tension, inadequate rest, stress, exposure to chill air may also increase the vatham.

Irregular diet pattern, excessive intake of water, exposure to cold air, over intake of sour tasted food stuffs.

### In Theraiyar Vagadam:

“வெய்யிலில் நடக்கையாலும் மிகத்தண்ணீர் குடிக்கையாலும்  
செய்யிழை மகளினரைச் சேர்ந்தனுபவிக்கையாலும்  
பையனே உண்மையாலும் பாகற்காய் தின்கையாலும்  
தையலே வாதரோகம் சனிக்குமென் றறிந்து கொள்ளே”

- தேரையர் வாகடம்

Excessive walking in hot sun, excessive intake of water, over sexual indulgence, intake of bitter gourd etc, may play a role to disturb the normal functions of vatham.

Ahara and vihara (errors of diet and habits) that give rise to vatha vitiation ie excessive intake of certain fruits and roots tends to increase vayu.

Excessive intake of cold substances or exposure to severe cold, exposure to rain, fog or mist, cool breeze, staying in high hills – all those are liable to increase kabha. On these two essential causes namely vatha and kabha prakobam keelvayu is said to develop.

Further it is said that excessive sexual indulgence that give rise meganoi may also produce keel vayu. It may also develop by hereditary causes.

#### **External Causes:**

#### **Environmental Factor:**

“வாதவர்த்தன காலமேதோ வெண்ணில்  
மருவுகின்ற ஆனி கற்கட மாதம்  
ஆதனைப் பசியோடு களர்த்திகை தன்னில்  
அடருமே மற்ற மாதங்கள் தன்னில்  
போகவே சமிக்கின்ற காலமாகும்”.

- யூகி சிந்தாமணி

The vatha disease will be precipitated in the months from Aani to Karthikai, (From June to December)

#### **Internal Causes:**

#### **Astrological Causes:**

In Manimanthira Vaidhya Sekaram,

“கூறுமொன்று மூன்றுடன் குலவுநாலைந் தேழினும்  
குற்றமாம் நலத்தினும் கொடூரம் பன்னிரண்டிலும்  
சேரவே புதனதானுமே சீரியம்மனை நின்றிடில்

செப்பொணாத் தீமையோடு செய்யும் பச்சந்தானும்  
 நெடுந்துக்க மிக்கவாம் நடக்கந்தாது தொழில்தாம்  
 நிந்தையாகு கீல்பிடிப்பு நீடு மெயில் தோன்றுமாம்  
 காரியங்கள் சேதமாங் கால்வயது குறையுமாம்  
 கண்டுணர்ந்து கணிவல்லோன் கருத்துடன் செப்பினரே”

- மணி மந்திர வைத்திய சேகரம்

Astrology says that keelpidippu is produced by planets power and position at certain period. So, if vatha is predominant, the disease rheumatism will occur. The vitiated vatham gradually disturbs and deranges the functions of vatham, pitham, kapham, Ezhu udalkattugal and manifest the joint disease.

### **Vatha Kanma Varalaru:**

“நூலென்ற வாதம் வந்த வகைதா னேது  
 நுண்மையாய் கன்மத்தின் வகையைக் கேளு  
 காலிலே தோன்றியது கடுப்ப தேது  
 கைகாலில் முடக்கியது வீக்கமேது  
 கோலிலே படுக்கின்ற விருட்சமான  
 குழந்தை மரந்தனை வெட்டல் மேல் தோல் சீவல்  
 நாளிலே சீவசெந்துகால் முறித்தல்  
 நல்ல கொம்புதழை முறித்தல் நலித்தல்தானே”

- அகத்தியர் கன்ம வரலாறு-300

It attributes the following psychosocial factors such as removing the bark of living trees breaking the legs of the animals cutting the trees in the living branches and removing leaves.

### **2. Mental Factors:**

“அந்தணர் கற்பு மாதர் அருளிய சாபத்தாலு  
 முந்தியவினையாலும் முதிர் கர்ப்ப மேகத்தாலுஞ்  
 சிந்தையிற் கொடுமையாலுஞ் சிவகுரு நிந்தையாலுந்  
 தொந்தமாம் வியாதியாலும் தோன்றிடும் சூலைதானே”.

- அகத்தியர்

Apart from physical factors some other mental factors caused the derangement of gunas. The deranged gunas tend to vitiate the doshas and produce the disease.

### **3. Pithamegam as Causes of Keelvayu**

According to Agasthiyar vaidhya Kaandam – 600 Pithamegam is said as an important factor for the causation of mega soolai. In this condition megam, the coordination of vatha, pitha, and kaba has broken down. Megam increases pitha and so excessive heat is felt from head to apanan. By this pithamegam all the ten vayus get deranged and so the disease is produced.

### **4. Ama Dosham:**

After taking a diet, if amasayam is not properly digested, the improper digestive residue is called ama. An another school of thought says that due to impairment of the Agni, the annarasa is not properly formed in the amasaya and this state is called as ama.

When there is impairment of Agni, undigested food becomes serious toxic condition and causes amadhosha. This primary offending factor ama after provoking the vatha, travels through suitable channels in the body and settle in the joint, where the santhiga kapha resides and antagonizes the functions of vatha and kapha, resulting in pain, swelling, tenderness, crepitation and restricted movements at time.

The main factors concerned in the production of ama are mandagni. Which alters the normal secretion of digestive juice.

Dietic alterations and emotional stress that contribute to the formation of ama are:

1. Intake of heavy indigestible foods.
2. Intake of certain food materials which are incompatible to one another.

3. Consumption of raw and uncooked materials.
4. Intake of highly cooled or freeze particles.

Irrigating food, capable of causing inflammation of the stomach and intestine (or) distension of the abdomen.

#### **NOI ENN (CLASSIFICATION):**

Classification of keelvayu is based on tridosha theory.

According to this classification keel vayu is classified into 10 types.

They are

- ❖ Valikeelvayu
- ❖ Azhal keelvayu
- ❖ Iyya keelvayu
- ❖ Vali azhal keelvayu
- ❖ Vali iyya keelvayu
- ❖ Azhal vali keelvayu
- ❖ Azhal iyyakeelvayu
- ❖ Iyya vali keelvayu
- ❖ Iyya azhal keelvayu
- ❖ Mukkutra keelvayu

#### **AZHAL KEEL VAYU**

In Siddha literature Azhal Keel Vayu comes under the topic of Vatha disease. Keel vayu is the general term that includes all kinds of joint disease (Locomotor System).

Description of the Nomenclature.

Azhal Keel Vayu = Azhal + Keel + Vayu

Azhal	:	Pitham
Keel	:	Joint
Vayu	:	Vatham.

Initially the joint is affected by the vitiated vatham, kabham and pitham is accompanied later. Also this is a disease of pitha kalam (middle 1/3 rd of the life space).

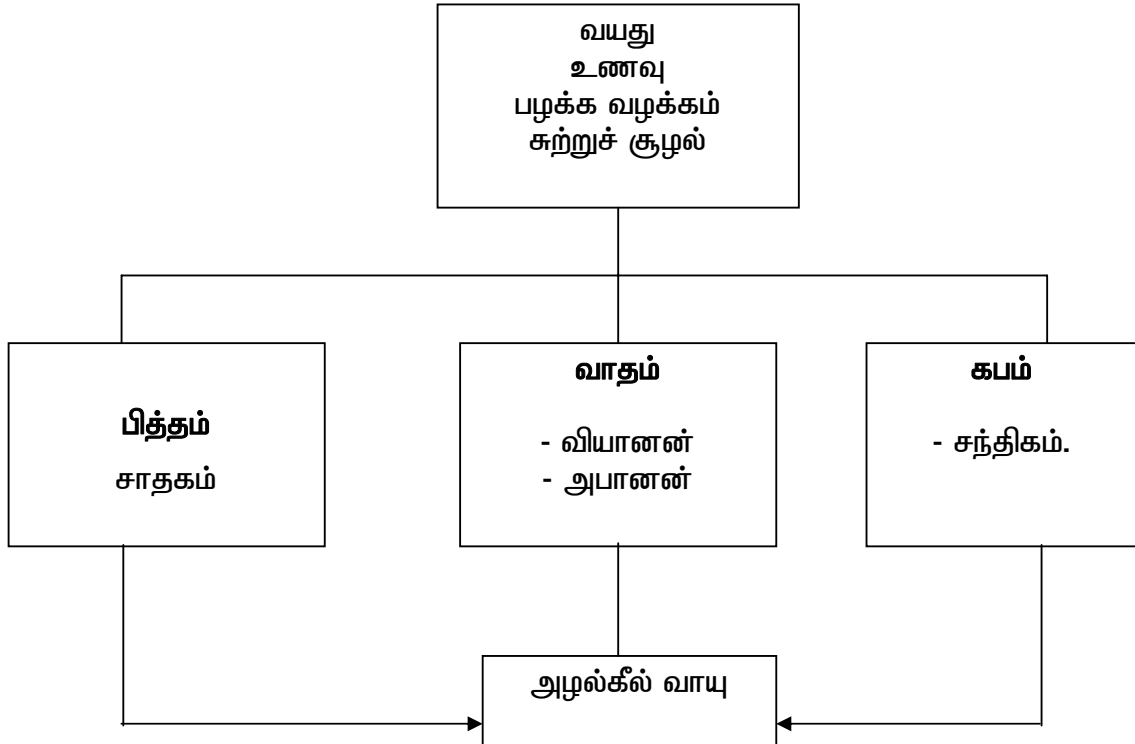
**Signs and Symptoms:**

“பித்தக கீல் வாய்வு தன்னாற் கீல் மூட்டு வீங்கிச்  
 சித்தர்செய் மருத்துவத்தில் சீர்படாத  
 தக்கறு காய்ச்சல் கண்டு சாலவே தனைதான் தந்தே  
 மெத்தறு சிகிச்சை தன்னால் மென்மேல் நீக்கும்ப்பா”

- சபாபதி கையோடு

It is characterized by swelling of joints associated with severe pain and pyrexia. Since it is not quickly responding to medicine the prolonged medical care is said to be essential. As pitha increases, kapha in the joint decrease and hence dryness occur. So during flexion of the joint crepitation sound is produced.

**நோய்வரும் வழி - முக்குற்ற பாதிப்பு.**



## EXPLANATIONS ABOUT THE THREE DOSHAS:

### VATHA:

The term vatha denotes vayu, dryness, pain flatulence and lightness.

#### I. Location of Vatha:

“நாமென்ற வாதத்துக் கிருப்பிடமே  
நாபிக்குக் கீழென்று நவிலலாகும்”

- யுகி முனி

The Vatha is located in the hip, below the abdomen, moolatharam and sexual organs.

It is also said that Vatha is settled in various places including bones, joints, nerves, vessels, hair follicles, muscles and it excretes sperm, urine and stool.

#### II. Functions of Vatha:

The important functions of vatha are respiration, voiding of excreta, stimulate the body and soul, refreshes and proper harmony of the seven thathus.

#### III. Effect of vitiated vatha:

Vague pain, exquisite pain, extreme dryness, palpitation, dislocation of the joints, disfunctioning of the sexual organs, constipation, dysuria, excessive thirst, severe pain in long bones, difficulty in flexion and extension of the limbs, dark complexion and emarciation are the main ill effects of the vitiated Vatha.

#### Types of Vatha:

Though the Vatha is one, according to the functions and location it is classified into ten. They are.

- 1. Piranan:** It is located in between the heart and nose. It is mainly responsible for respiration, and it is necessary for proper digestion and utilization of the food material.

2. **Abanan:** It is located in the rectum, lower abdomen, urinary bladder, sexual organs, and thighs. It carries the digested nutrients to the concerned areas. Its main function is excretion of urine, fecal matter, semen and ovum.
3. **Viyanan:** Though it is present in the whole body, it is chiefly located in the heart. From the skin it spreads through the nerves and blood vessels to various organs and helps in flexion and extension. It is responsible for the sensation of the skin.
4. **Udhanan:** It is located in the chest, neck, nose and umbilicus. It is responsible for speech, complexion of the skin, stability and good thinking.
5. **Samanan:** It is mainly located in the intestines. It is responsible for proper digestion and it carries the digested nutrients to each and every organ.
6. **Nagan:** It is responsible for intelligence. Its functions are blinking of eyelids and goozing of hair.
7. **Koorman:** It is responsible for eyesight. Its functions are yawning, are secretion of tears.
8. **Kirukaran:** It is responsible for appetite and salivation. It produces cough and sneeze.
9. **Devathathan:** It is responsible for the feeling of tiredness, angry and immoral behaviours.
10. **Thananjeyan:** It is present in the nose and produces a generalized swelling of the body disappears only after the third day of death, after opening of the skull.

In case of Azhal Keelvayu, among the vathas, Viyanan and Samanan were affected in all patients. Secondly Abanan, Udhanan, Kirugaran and Devathathan were affected in most patients.



## **PITHA**

The term pitha denotes gastric juice, bile, energy, heat and anger etc.

Pitha (Heat) in the human organism is heat as it possesses all the characteristics of the external fire, such as burning like boiling and heating etc. It produces the internal heat necessary to maintain the integrity of the human body and any increase or decrease in this produces a simultaneous action in the organism. The chief function of bile lies in metamorphosing the chyle to a protoplasmic substance like the sperm in men and the ovum in women. It corresponds to metabolism or cell sub-division. Heat may be said to include both bile and metabolism of tissues as well as the body heat that is the product of the latter. It is also viewed by some that pitha is the name for the heat confined the liquid bile, the principle agent in digestion. The origin of bile is in the liver. In the heat, bile brings about the relation of one's desire; in the eyes the catching of the lubricating substances that are applied to the skin. It is blue in its normal colour and yellowish in its deranged condition; and it turns into an acid when deranged or vitiated. Pitha (Heat) in its normal state remains in the lymph, chyle, blood and saliva but chief lying in the stomach. It gives sight to the eyes, beauty to the skin and cheerfulness to the mind. Its derangement causes sleeplessness, indigestion, red boils, jaundice, cirrhosis, ulcers, catarrh, dropsy, haemorrhage, acidity, eructation, delirium, perspiration, thirst, bitter taste in the mouth, burning sensation in the body especially palms and soles etc.

Head, heart, bladder, abdomen, umbilicus, stomach, saliva, sweat, blood, eyes and skin are the sites of pitha. The important functions of pitha are appetite, thirst, digestion, sensation of taste, eyesight and intelligence. Excessive heat in the body, improper digestion, excessive sweat, giddiness, syncope and immoral behaviours are some of the ill effects of vitiated pitha.

## **I. Location of Pitha:**

“பேரமென்ற பித்தத்துக் கிருப்பிடமே கேளாய்  
பேரான கண்டத்தின் கீழ்தாகும்”.

- யூகி முனி

Pitha is located in Head, heart, bladder, abdomen, umbilicus, stomach and also saliva, sweat, blood, eyes and skin are the sites of pitha.

## **II. Functions of Pitha:**

The important functions of Pitha are appetite, thirst, digestion, sensation of taste, eyesight and intelligence.

## **III. Effects of Vitiating Pitha:**

Excessive heat in the body, improper digestion, excessive sweating, giddiness, syncope and immoral behaviours are some of the ill effects of vitiating Pitha.

## **Types of Pitha:**

According to the function and location, Pitha is classified into five types. They are.

### **1. Anar Pitham:**

It is located in the stomach and intestines and responsible for proper digestion.

### **2. Ranjaga Pitham:**

It is located in the intestine and responsible for the colour of the blood.

### **3. Sathaga Pitham:**

It is located in the heart and controls the functions of the body.

### **4. Alosagam:**

It is located in the eyes and responsible for proper sight.

### **5. Prasagam:**

It is located in the skin and responsible for complexion.

In case of Azhal keelvayu, Sathagam were affected in all patients.

Among the pithas Anarpitham and Ranjagam were affected most of the patients.

## **KAPHA:**

Kapha (phlegm) supplies the body with moisture even as pitha furnishes it with heat and imparts stability and weight to the body. It adds to the strength of the body, increases the firmness of the limbs and keeps them united, preventing their disunion. It helps digestion by moisturing and disintegrating food with its humid essence. It imparts to the tongue the power of taste and helps sense-organ like the eyes, ears and the nose in performance of their respective functions. Its derangement causes excess of thirst, dull appetite, throwing out of phlegm in cough, goiter, urticaria etc. Meals taken before digestion, day – sleep, taking sweets, molasses etc. generally aggravate phlegm.

The important functions of kapha are maintaining the viscosity and proper functioning of the joints. Pain in the long bones, dysfunction of the joints, improper digestion, excessive sleep and inhibition of understanding capacity are the effects of vitiated kapha.

### **I. Location of Kapha:**

The Kapha is located in the tongue, nose, chest, blood, lipids, bone marrow, bones, nerves, brain, large intestines, eyes and joints.

### **II. Functions of Kapha:**

The important functions of Kapha are maintaining the friction and viscosity and proper functioning of the joints.

### **III. Effects of vitiated Kapha:**

Pain in the long bones, dysfunction of the joints, improper digestion, excessive sleep and inhibition of understanding capacity.

## **Types of Kapha:**

There are five types of Kapha. They are,

### **1. Avalambagam:**

It is located in the lungs and it controls the other four kaphas.

### **2. Kilethagam:**

It is located in the stomach and it is responsible for the proper digestion.

### **3. Podhagam:**

It is located in the tongue and helps to feel the sensation of taste.

### **4. Tharpagam:**

It is present in the head and keeps the eyes cool.

### **5. Santhigam:**

It is present in the joint and responsible for proper functioning of the joints.

In case of Azhal Keelvayu, among the Kaphas – Avalambagam, Santhigam was affected in all patients and Kilethagam was affected in most patients.

## **NOI NADAL (PATHOLOGY)**

### **Thridosha Theory:**

The doshas viz, vayu, pitha, and kaba constitute the tripod on which Siddha stands. To understand this theory perfectly and correctly is by itself a long and arduous study.

The subject being a very complicated one, it can not be explained within the compass of a few pages. Also it has been defined by different experts in different ways but the basic principles to which they all point to are the same.

The theory of vayu, pitha and kaba begins where modern physiology ends; for, it endeavours to explain all the physiological processes as also the principles which guide them.

Vatha comprehends all the phenomena which come under the functions of central and sympathetic nervous systems. Pitha signifies the functions of

thermogenesis or heat production and metabolism comprehending in its scope the process of digestion, colouration of blood and formation of various secretions and excretions which are either the means or the ends of tissue combustion.

Kabha signifies the functions of thermotaxis or heat regulation and secondarily formation of the various preservative fluids (e.g) mucus, synovia etc.

Vatha, Pitha and kabha occur in two forms.

### **1. An Invisible or Essential form.**

It mainly guides the physiological processes pertaining to them naturally.

### **2. A Crude or Visible Form**

These are the products of the invisible process

The relation between the two forms is very close so that the derangement of the essential form of one principle gives rise at once to increased or morbid secretions and excretions of that principle. The failure to recognize the difference between these two forms of the principles has given rise to the erroneous rendering.

Siddhars trace the process of development of Dhosa derangement the abnormality of Dhathu equilibrium through the following stages.

### **1. Accumulation and Excitation (Thannilai valarchi):**

This is the state where the dosha accumulates in a particular part as stagnant dosha. When the stagnant dosha has accumulated and permeated a structure, there is excitement from aversion towards similar and attraction towards contraries.

This is known as prakobam.

### **2. Spreading (Piranilai Valarchi)**

This is the stage which the excited dosha extends to another part. When the excited dosha having extended to another part it becomes located and causing beginnings of specific disease of that structure.

In case of keel vayu owing to intrinsic and extrinsic causes, seasonal conditions of severe cold and changes on earth, vatha increases and joins with kaba and produces disturbances to the normal function of the Abanan and Viyanan. Owing to the addition of kaba with vatha vitiation there is swelling, pain, sometimes fluid accumulation and immobility etc in the joints.

Depending upon the vitiation of vatha and kaba, Rasa and Raktha dhathus are first affected. As such there may be anorexia subsequent anaemia and sobai. When the disease takes a longer course other dhathus may also deteriorate one by one.

The result of vatha and kaba derangement is mentioned as follows.

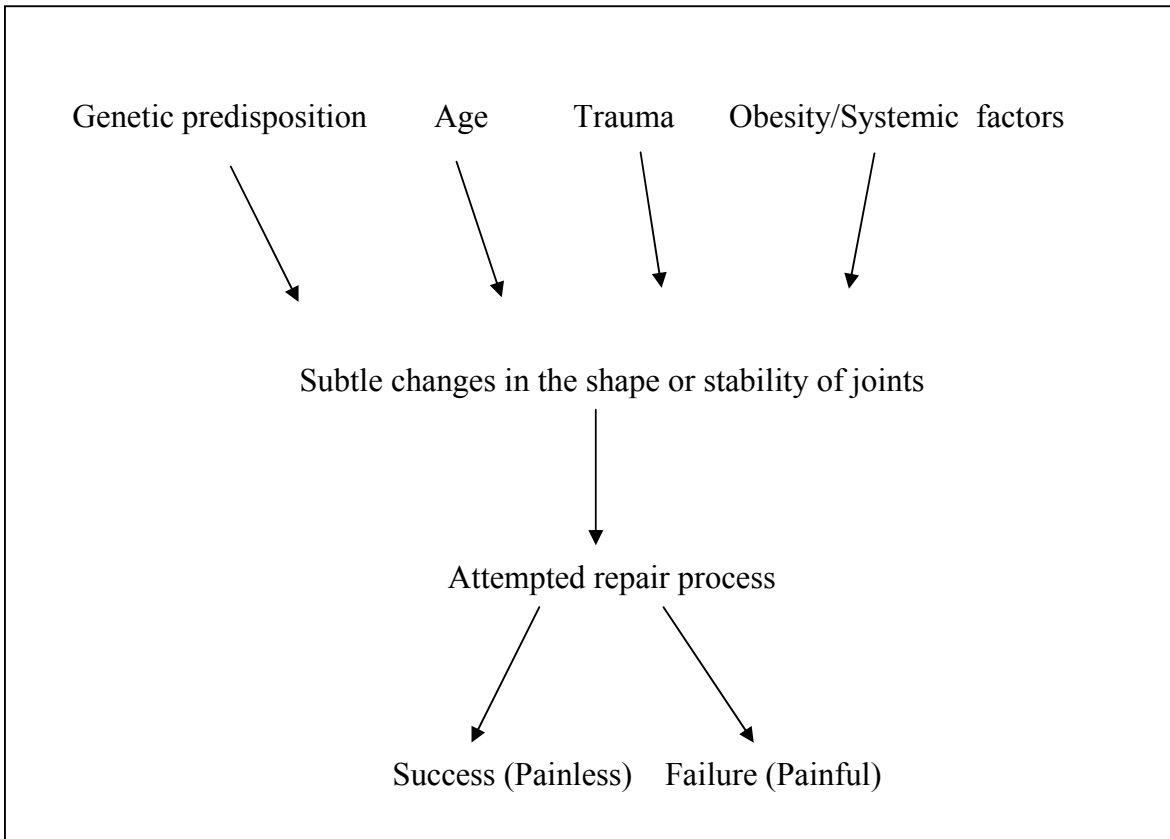
“வலியுமையந் தன்னிலை கெட்டு  
வலியுடன் வீக்கச்சுரமும் காய்ந்து  
மூட்டுகள் தேறும் முடுக்கியே நொந்து  
மூட்டுகள் தன்னில் நீரும் சுரந்து  
தளங்கொணா வலியுடன் நொந்திடுமாமே.”

- சபாபதி கையேடு

#### **KUGARANA MAATRAM (PATHOGENESIS):**

The derangement of panjapootha in pithakeelvayu is as follows.

S. No.	Pootham	Nature of derangement	Effect
1.	Mann	↑	New bone growth
2.	Neer	↓	Diminished synovial fluid
3.	Thee	↑	Destruction of articular cartilage
4.	Vayu	↑↑	Swelling and pain
5.	Aagayam	↓↓	Reduction in joint space



## **THE COURSE OF THE AZHAL KEELVAYU**

### **KURIGUNAM (CLINICAL FEATURES)**

First there will be blocking of nostrils, watering of the nose, hoarseness of voice, light fever, pain in the extremities, stabbing and excruciating pain in the affected joints, difficulty in moving the joints, disinclination for food, tastelessness and lassitude etc.

Next depending upon the course the disease takes we will be able to diagnose the disease correctly according to the signs and symptoms. We will then be able to declare the exact classification of keelvayu. Each variety has got its own peculiar characteristic signs and symptoms.

### முழங்கால் வாதம்:

“திரண்டிடு முழங்கால் வீங்கிச் சேரநொந் துளைந்து குத்திப்  
புரண்டிட மடக்கி மிண்டிப் போதவே நடைகொடாது  
மருண்டுவேல் கண்ணமா னம்பு வாளென மிளிருங் கண்ணாய்  
முரண்டரு முழங்கால் தன்னின் மொழிந்திடு வாதமாமே”

- பரராச சேகரம்

மயக்கம், கண்கள் சிவக்கும், பாதம் குளிரும், வயிறு புண்ணாக்கும்,  
சந்துகள் தோறும், கடுப்பு தோன்றும் சிறுநீர் வற்றும்.

“வாதத்தின் குணமே தன்னில்  
வயிறு பொருமிக் கொள்ளும்  
தாகத்தில் மேனி கைகால்  
சந்துமே கடுப்புத் தோன்றும்”

- குறியடையாள நாடி

“அறியும் வாதத்தில் அடுத்த பித்தமாயின்  
குறியது தான் வாயுக்குழறும் நெறியாக  
குளிருங் கால் வீங்கும் குடல் புரட்டும் விம்மித்  
தெளிவில்லை புத்தியெனச் செப்பு”

- கண்ணுசாமியம் வைத்திய சேகரம்

### NILAM [Geographical distription]

The living places are divided on the basis of the natural geographical features into five distinct types known as “Thinai”. They are “Kurinchi” “Mullai”, “Marutham”, “Neithal” and “Palai”.

1. Kurinchi : Mountain and its surroundings.
2. Mullai : Forests
3. Neithal : Sea and seashore
4. Marutham : Fields
5. Palai : Desert and its surroundings.



**Kurinchi Nilam:**

Inhabitant of this thinai frequently suffers from shivering, fever leading to depletion of blood, enlargement of liver and spleen. Increase of kapham.

**Mullai Nilam:**

Inhabitants of this thinai suffer from pitha disorders and also from disorders due to vatha aggravation and liver enlargement.

**Neithal Nilam:**

Inhabitants of this thinai suffer for vatha disorders and also suffer from excessive flatulence, enlargements of liver, obesity etc.

**Marutha Nilam:**

Inhabitants of this thinai are free from all disorders because all the three thosas are always kept in proper proportion. This is an ideal place for a healthy life.

**Palai Nilam:**

Inhabitants of this Thinai Suffer from disorders due to Vatha, Pitha, Kapha elements.

Geographical distribution plays a vital role in altering the Thridoshas.

In case of Azhal Keelvayu, most of the patients had inhabitants of Marutha Nilam and few patients belonged to Palai Nilam.

**UDAL KATTUGAL:**

Seven physical constituents. They are the following.

**1. Saaram: (Chyle)**

It is responsible for growth and development. It keeps the individual in good spirit and it nourishes the blood.

**2. Chenneer: (Blood)**

Blood imparts colour to the body and nourishes the muscle responsible for the ability, intellect of the individual.

### **3. Oon: (Muscle)**

It gives shape to the body according to the requirement for the physical activity, nourishes fat and gives plumpness.

### **4. Kozhuppu: (Fat)**

It helps in lubricating the different organs and maintains oily matter of the body.

### **5. Enbu: (Bone)**

Supports all the system and responsible for the posture and movement of the body.

It is affected in all the twenty patients of Azhal Keelvagu.

### **6. Moolai: (Marrow)**

It fills the bone cavity. Nourishes semen, imparts strength, endurance and shining appearance.

### **7. Sukkilam or Suonitham: (Sperm and Ovum)**

It is responsible for reproduction.

Among the seven Udal Kattugal Saaram, Chenneer, Oon and Kozhuppu were affected in most of the patients of Azhal Keelvayu.

### **Kanmenthriyam**

1. Vai : To speak and eat
2. Kal : To walk
3. Kai : To take and give
4. Eruvaai : To excrete
5. Karuvaai : for birth.

In case of AZHAL KEEL VAYU Kal, Kai, Eruvai were affected in most of the patients.

## **Udal Vanmai**

Body immunity is of three kinds.

### **1. Iyarkai Vanmai:**

Natural immunity of the body caused by mukkunam by birth.

### **2. Kala Vanmai:**

Growing of the body and strength according to the age.

### **3. Cheyarkai Vanmai:**

Improving the health by giving valuable food and medicines.

Diet, Physical exercise and Age play a vital role in “AZHAL KEEL VAYU”. So, Cheryaki Vanmai of an individual is affected.

## **KALANIZHAIGALIN MUKKUTRAM**

	<b>Thanilai Vazharchi</b>	<b>Vettrunilai Vazharchi</b>	<b>Thanilai Adaithal</b>
Vatham	Muthuvenil	Kaarkalam	Koothir Kalam
Pitham	Kaarkalam	Koothir Kalam	Munpani
Kabhan	Pinpani	Elavenil	Muthuvenil

Vatham vitiates during Mutuvenil i.e, during summer, the environment is hot and it leads to dryness, similarly the body is affected by excessive heat and loses its energy through perspiration and the digestion is impaired.

So, in AZHAL KEEL VAYU the disease show its exacerbation during Muthuvenil Kalam.

## **PINIYARI MURAIMAI – (DIAGNOSIS)**

Piniyari muraimai is the methodology of diagnosing the disease in siddha science which is based on the following three main principles.

- ❖ Poriyal arithal
- ❖ Pulanal arithal
- ❖ Vinathal.

Porigal are considered as the five sensory organs of perception namely nose, tongue, eye, skin and ear.

The pulangal are functions of sensory organs. They are smell, taste, touch, vision and hearing. Physicians pori and pulan are used as the tools for examining the pori and pulan of the patient.

Vinathal is gathering the information regarding the history of the disease, clinical features etc. from the patient or his immediate relatives who are taking care of him when the patient is not in a condition to speak or the patient is a child.

The above principles correspond to the methodology of inspection, palpation, percussion and interrogation of modern medicine in arriving at a clinical diagnosis of the disease.

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

The Siddhar Thaeran mentioned it as follows.

“நாடி ஸ்பரிசம் நூநிறம் மொழிவிழி  
மலம் மூத்திரமிவை மருத்துவராயுதம்”

- தேரையர்

The Siddhar Agasthiar also explained it as follows.

“மெய்க்குறிநிறம் தொனி விழிநா இருமலம் கைக்குறி”

- அகத்தியர் வைத்திய சிந்தாமணி வெண்பா 400

Hence the diagnosis is made by the following

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

**Naadi:**

Naadi is the vitiating element of the body which is of three types viz Vatha, Pitha, and kaba. For examination of naadi of male patient his right hand is preferable and of female her left hand is preferable. Therefore physician will use his left hand for naadi examination of the male patient and use his right hand for female patients.

During naadi examination Vatha is felt by the tip of index finger, Pitha is felt by the tip of the middle finger and Kabha is felt by the tip of the ring finger.

These three naadis are formed as follows:

Edakalai	+ Abanan	= Vatha
Pingalai	+ Piranan	= Pitha
Suzhumunai	+ Samanan	= Kaba

The ratio between Vatha, Pitha and Kabha is 4:2:1. In pithakeelvayu the following types of naadi are seen commonly.

“காணப்பா வாதமீறில் கைகால்கள் பொருத்து நோகும்  
ஊணப்பா குடல்புரட்டு மலம்சலம் பொருமிக்கட்டும்  
ஊணப்பா குளிஞ்காய்ச்சல் உடம்பெல்லாம் குத்தும் வாய்வு  
வீணப்பா குதமிறுக்கம் வேர்வையும் வேர்க்குந்தானே”.

- காவிய நாடி

(ie) When Vatha is vitiated there is pain in the joints of hands and legs, retension of urine and constipation, shivering and fever with body pain and excessive sweating may also present.

“சொல்லிய ஐயத்தோடு பித்தமும் கூடிற்றானால்  
வல்லியம் போலக் குத்தும் மைந்தனே எலும்பு தோறும்”

- காவிய நாடி

(ie) When Kabha and Pitha are vitiated excruciating pain in bone will occur.

“வாட்டிடும் சேத்துமத்தில் வந்திடும் வாதமாகில்  
நாட்டிய கால்கள் போலே நரம்பெல்லாம் வலித்து நிற்கும்”

- அகத்தியர் நாடி

(ie) When Kabha and Vatha are vitiated pain and restricted movement will occur.

“பித்தத்தில் வாதமாகி பிடரியுங்காலுங்கையுங்,  
குத்தது போலேயாகுங் குறுதி மெய்பதூறும் பின்னே,  
அத்தியாயுலருமேனியாக முஞ்சுரத்தால் நோவாம்,  
புத்தியுமடியுமிந்தப் பொறுமைபோய்க் கோபமாமே.”

- அகத்தியர் நாடி

When both pitha and vatha vitiated pricking pain occurs in both upper and lower extremities and also around the nape of the neck.

“திருத்தமாம் வாதத் தோடேதீங்கொடு பித்தம் சேரிற்  
பொருத்துகள் தோறும் நொந்து போதரே பிடிக்கும்”

- நோயின் சாரம்

Vitiation of vatha and pitha leads to the formation of joint pain

“அறிந்துபார் வாதமே தனித்ததானால்  
சரிந்திடவே கால் முடக்கும்”

- அகத்தியர் இரத்தினச் சுருக்கம்

When vatha gets vitiation it causes restriction of movements in lower extremities.

**Naa:**

In vatha diseases tongue may be in dark colour. In pitha diseases it will turn into yellow colour. In Kabha diseases it will be turned into white colour.

In pitha keelvayu it will seen as dried one. White coated tongue may also be seen.

**Niram:**

In diseased condition the colour of the affected part and also the general colour of the body may be altered according to the severity of the diseases.

In pitha keelvayu the affected joint will be seen red in colour.

**Mozhi:**

Speech will be affected in vatha diseases when piranan, uthanan, kirugaran and devathathan are disturbed.

In pithakeelvayu speech will not be affected.

**Vizhi:**

Normally vizhi will be affected in old age. In certain diseases like mathumegam and kuruthi azhal vizhi will be affected in the middle age.

In pithakeelvayu which is the disease of 4<sup>th</sup> decade vizhi will begin to loose its accuracy and clarity.

**Malam:**

Constipation will increase the vatha. Purgation will decrease the vatha.

Malam may be affected more or less in pitha keelvayu.

**Moothiram:**

The waste materials are excreted through urine from the body.

Moothiram is affected mainly in mathumegam, Vellai, vettai etc.

In pitha keelvayu alone there will be no specific change in neerkuri.

But in neikuri the appropriate findings may be seen according to the derangement of muthodham and yakkai elakkanam.

**Sparisam:**

The abnormal increased sparisam is clinically called as vali (pain)

In pithakeelvayu sparisam is affected and there by production of pain in the affected area that is the joints. It is the main clinical symptom of this disease.

## நோய் நிதானம் (D.D)

Azhal Keel Vayu is differentiated from other types of keel vayu as follows.

### 1. Vazhi Azhal Keel Vayu:

“வாதபித்தக் கீல்வாயுவின் வருங்குறி சாற்றக் கேளாய்  
ஏதாமந் மந்தமேப்பம் இரைச்சலும் வயிற்றிற்காணும்  
ஓதருங் குத்தல் வீக்கம் ஏய்தலில் எரிச்சலுண்டாம்  
காதறு முறக்க மின்மை காய்ச்சலும் காணும் கண்டாய்”

- சபாபதி கையேடு

Vazhi azhal keel vayu have the symptoms of ajeeranam (Indigestion), aeppam (Eructation), and vayiru eraichal (Abdominal Discomfort). This disease occurs due to excessive intake of food which increases vatha and pitha (Eg. Mutton, Egg, Tuber and Sour) and frequent intake of liquors. Laziness may also produce this disease.

### 2. Azhal vali keelvayu:

“வெயிலிடைத்திரிதல் பித்தமிக்குண வருந்த லுள்ளம்  
பயிலுறு கவலையாதிப் பண்பினால் பித்த வாதம்  
கயிலுறு வாய்வு தோன்றிக் கைப்புடன் மயக்கம் வாந்தி  
இயலுறு மில்லிற் செந்நீர் இறங்கலால் நோக்குங் கொள்ளும்”

- சபாபதி கையேடு

It is characterised by pain and swelling of the joint associated with bitter taste, vomiting, fainting, bleeding from the gums.

### 3. Azhal Iya keelvayu:

“மிதலிலாக் கல்வியை மிகுவிக்குமுண்டி பித்தக்  
கதமுறு செயலி வற்றிற் காண்பித்தக் கபக்கீல்வாயு  
இதமுறு மயக்கம் வாந்தி எரிகரத் தலைநோய் வீக்கம்  
மதகரி நன்பின் மர்பு துடிப்புடன் எரிவும் செய்யும்”

- சபாபதி கையேடு



It is characterised by pain and swelling of the joint associated with vomiting, fainting, hyper pyrexia, headache and palpitation.

#### 4. Santhu Vatham:

“செய்கைதான் சந்துகளுமிகத் திமிர்ந்து  
செடமெங்கு நொந்துமே மிக அழற்றி  
நைகையாய் நளுத்துமே மயிர்க்கூச்சிட்டு  
நாணியே முன்போல நகை கொடாது  
மைகைதான் மயக்கமொடு வாய்நீளுறும்  
வறண்டிடுமே நரவுதானடிக்கடிக்கு  
கைதைதான் நரணிதனிற் றரிக்கொணாது  
சஞ்சலிக்குஞ் சந்துவாய் வாதங்களே”.

- யூகி வைத்திய சிந்தாமணி

It is characterized by body pain, all joints pain, not able to walk normally, deliriousness and excess salivation and dryness.

#### PARIHARA MURAI FOR AZHAL KEEL VAYU:

“வைத்தியச் செயல் வைத்தியமாமே”

- திருமூலர் 8000

So in siddha, treatment is not only for removal of the diseases but for the prevention and improving the body condition after removal of disease. This is called as Kappu or Neekkam or Niraippu.

In neekkam the following principles must be noted.

“நோய்நாடி நோய் முதல் நாடி அதுதணிக்கும்  
வாய்நாடி வாய்ப்பச் செயல்..”

“உற்றானளவும் பிணியளவும் காலமும்  
கற்றான் கருதிச் செயல்”

So it is essential to know the disease and the cause for the disease before treating the patient. So also the nature of the patient the degree of illness, and the season and time of the occurrence of symptoms must be noted.

**Line of Treatment:**

It includes

1. To regularize the vitiated vatha by administrating purgatives or laxatives
2. Internal medicines and if necessary external medicines must be given to normalize the affected udalthaathus.
3. Special therapeutic measures such as yogasanas, thokkanam, and ottadam to hasten the prognosis.
4. Proper diet habits should be advised.

**Muthoda Samanilai:**

This is the first step in the management of disease in siddha system of medicine. Here vatha is abnormal (ie) elevated from its normal level. It leads to elevation of pitha and decrease of kaba.

The Vatha, Pitha and Kaba are observed in the body as follows.

Vatha -	Lukewarm
Pitha -	Hot
Kaba -	Cold

The normal ratio of these three thathus is as follows

Vatha	:	Pitha	:	Kabha
1	:	½	:	¼
		or		
4	:	2	:	1

Purgation is best for neutralizing vitiated vatha. That is why Vellai ennai 10 ml at morning is given in the first day to every patient who are affected by this vatha disease.

## Kappu (Prevention)

To prevent Azhal keel vayu,

1. Control the body weight by diet and exercise.
2. Modify the nature of work which gives stress to a particular joint (e.g)  
Avoid prolonged standing and long distance walking.
3. Avoid taking excess sour, astringent and bitter tasted foods.
4. To follow the “Noi Anuga Vithi” described as follows.

### நோயினி்றி வாழ வழிமுறைகள்:

1. வெந்நீர், நீர் கலந்த மோர், நெய்யினை உருக்கியும் சாப்பிட வேண்டும்.
2. நாள் ஒன்றுக்கு இருமுறை மட்டும் உணவு உண்ண வேண்டும். (பகல் அறுசுவை உணவு, இரவு சிற்றுண்டி)
3. முதல் நாள் சமைத்த உணவுகளை உண்ணக் கூடாது.
4. பசித்த பின்புதான் உணவு அருந்த வேண்டும்.
5. இனிப்பு சுவையுள்ள பொருட்களைத் தவிர்க்க வேண்டும்.
6. வாழையின் இளம்பிஞ்சினையே உணவில் சேர்த்துக் கொள்ள வேண்டும்.
7. கிழங்குகளில் கருணைக்கிழங்கு மட்டுமே அதிகமாகப் பயன்படுத்த வேண்டும்.
8. பெருந்தாகம் கொண்டாலும் உப்பு நீர் அருந்தக்கூடாது.
9. உணவு உண்டபின் சிறிது குறுநடை செல்ல வேண்டும்.
10. இரவில் பசுவின் பாலை அருந்த வேண்டும்.
11. நன்கு புளித்த தயிர் உண்ணக் கூடாது.
12. கன்றுடன் கூடிய பசு, தெய்வம், முன்னோர்கள், குரு ஆகியோரை நாள்தோறும் வணங்க வேண்டும்.
13. காலை இளம் வெயிலைத் தவிர்த்தல் நல்லது.
14. மலம், சிறுநீர் ஆகியவற்றை அடக்கக் கூடாது.
15. பகல் உறக்கம் கொள்ளக்கூடாது.

16. மாதவிடாய் மாதர்களிடமிருந்து உண்டாகும் துர்மணமும், ஆடு, கழுதை, துடைப்பம் இவைகளின் தூசி நம்மேல் படக்கூடாது.
17. உணவு, உறக்கம், மலம், சிறுநீர் கழித்தல், அழுக்காடை, அணிதல், சீப்பிட்டு சீவுதல் ஆகியன மாலையில் கூடாது. (சூரிய அஸ்தமனத்தில்)
18. வாசனை பொருட்களையும், பூக்களையும் நடு இரவில் முகரக்கூடாது.
19. இடக்கையை தலைக்கு கீழ்வைத்த உறங்க வேண்டும்.
20. நகத்தினின்றும் உடம்பிலிருந்து சிந்துகின்ற நீர் பிறர் உடலில் படாமல் தவிர்க்க வேண்டும்.

### கால ஒழுக்கம்

1. மூன்று நாட்களுக்கு ஒருமுறை கண்மை இட்டுக் கொள்ள வேண்டும். (கரிசாலை மை)
2. நான்கு நாட்களுக்கு ஒருமுறை எண்ணெய் குளியல் வெந்நீரில் செய்து வெந்நீரையே அன்று அருந்த வேண்டும்.
3. ஏழு நாட்களுக்கு (வாரம்) ஒருமுறை முகச்சவரம் செய்ய வேண்டும்.
4. 45 நாட்களுக்கு ஒருமுறை நசிய மருந்து எடுத்துக்கொள்ள வேண்டும். (குப்பைமேனிச்சாறு, தும்பைச்சாறு)
5. 4 மாத்திற்கு ஒரு முறை பேதிக்கு மருந்து எடுத்துக்கொள்ள வேண்டும்.
6. ஆறு மாத்திற்கு ஒருமுறை வாந்தி மருந்து எடுத்துக்கொள்ள வேண்டும்.
7. வயதிற்கு மூத்தபெண்ணுடன் உடலுறவு கூடாது.
8. மாதம் ஒருமுறை மட்டும் சிற்றின்பத்தில் ஈடுபடுதல் நலம் தரும்.
9. பகற்பொழுது மற்றும் மாலை வேளைகளில் உடலுறவு கொள்ளக்கூடாது.

### NEEKAM (TREATMENT):

“முன்றிலொன்று யர்ந்ததை முன்னறிந்து  
முந்தியதை யொழுத்திட மருந்திடு  
தணியும் நோயின் தந்திரமிதுவே  
பேணிக் கணித்திடின பிறவாய் பின்குணம்”

Since the Siddha system of medicine is based on Mukkutra theory the treatment is mainly aimed in bringing the three dhoshas into its equilibrium state.

Since Azhal keelvayu is one of the vatha diseases, the deranged vatha the affect the Pitha also.

“விரேசனத்தால் வாதந்தாமும்”

According to the “Siddha literatures” vitiated vatha may be suppressed by giving purgatives.

But in the Azhal keel vayu pitha become excess, so the synovial fluid, get dried; so in the joint the proximal and distal bones get friction and ulceration occur. Due to ulceration and erosion both bones get union. Hence ankylosis of the joint occurs, so movements of the joint restricted and atrophy of muscles occur. Thus the joint lost its function.

#### **Kanma Neekam:**

“நலியாலே வந்த கன்மம் தீருவென்றால்  
நன்மரங்கள் கிணறுவெட்டல் குளங்கள் வெட்டல்  
தெய்வதலங் கோவில் கட்டத் தீரும்பாரு  
எளிதான பாலகர்க் காபரணம் மீதல்  
என்பதென்ற வாதமெல்லா மிடைந்துபோகும்.  
புழியான நோய் வந்தாலிப்படியே செய்து  
புதிவாக வைத்தியத்தை பிறகு செய்யே”

- அகத்தியர் கன்மகாண்டம் 300.

Agasthiar in his kanma kandam - 300 prescribed some specific expletory methods to get rid of the manifestation of the post misdeeds. Those are implanting fruitful trees establishing garden, laying road and pathway, digging wells and ponds for public use, constructing temples, donating ornaments to poor children must be done.

## Treatment of Azhal keel vayu in the text “Siddha Maruthuvam”

### Purgative:

The following purgative may be given firstly to balance the deranged Azhal.

Thrakshathy kudineer. 30ml to 60ml during the morning. It may be given weekly two to three times.

Then to regulate the vatha, vatha kesari thailam or kazharchi thailam may be given in small quantity.

### Internal Medicine:

- |    |                                    |   |               |
|----|------------------------------------|---|---------------|
| 1. | Vanga chunnam – 65mg               | } | with cow ghee |
|    | Sirungi parpam – 65mg              |   |               |
|    | Pavala parpam – 65mg.              |   |               |
| 2. | Kalamega narayana chenduram – 65mg | } | with cow ghee |
|    | Pavala parpam 65mg                 |   |               |
|    | Muthu parpam – 65mg.               |   |               |
| 3. | Poorna Chandrothayam 65mg          | } | with cow ghee |
|    | Muthu parpam – 65mg                |   |               |
|    | Sirungi Parpam – 65mg.             |   |               |

The duration of internal medicine for vatha disease:

“வாந்தி விக்கல் கண மந்தம் பேதிகட்கு  
மண்டலமென்று உறைவாதம் காமிலங்கம்  
கேந்திரு மண்டலம் முறை பற்பாண்டு சோபை  
என் மகோதரம் பிரிதி துணிகட் கூக்கம்  
ஓய்ந்திடும் மண்டலல்லுறை நூட்சென்று  
ஓழிவில் சுரங்கட்குறை மண்டல நான்குன்னி  
மந்திடுபே மித்திரமான சகல நோய்க்கும்.  
மருந்தாட்புண் மீட்டுமவை வாட்டாவாரே”

- பதார்த்த குண சிந்தாமணி

According to the above verse 82 days are necessary to treat vatha disease, by that relapse is prevented.

**External Medicine:**

1. Ulunthu thilam – Bandaged with the oil is best
2. Vallari Nei
3. Kukkil Vennai.

**Fomentation:**

Fomentation with the hotwater dipped, squeezed cloth will give good relief. If it is done is night it will reduce the morning stiffness.

Fomentation with heated fresh primai (Bacopa monnieri) gives relief from pain and swelling.

Like that fomentation with the leaf of erukku (calotropis gigantia) with lime fruit pieces will give good relief from swelling and pain.

**Sareera Sanjalam:**

It is a method to move the joints in their normal directions for 20 to 30 times and 2 to 3 times daily.

**Diet:**

Easily digestable foods are good. Vegetables and soups of chest bone and joints bones of the goat are good. Meat of the goat and flesh of birds like “Kadai” “Gowdari” are may be given. Avoid fish, is necessary young prawn may be fried with brinjal or beens.

**Diet restrictions,**

“புனிதுவர் விஞ்சு கறியாள்  
பூரிக்கும் வாதம்”.

Excess sour astringent tasted foods increase Vatha dhosha. So avoid such tasted food are necessary.

## **Niraivu (Restoration)**

The topic “Niraivu” deals about the description to avoid the recurring of the disease.

After treatment effort should be taken to clear the residual effects of the disease, to bring back the body condition of the patient to normal, this treated as Niraivu. Patient should also be mentioned to adhere to the preventive methods.

For Azhal keel vayu patients advice to avoid stress in the affected joints is a must. So prolonged walking and standing for long time should be avoided.

To follow all the preventive methods mentioned in the topic ‘Kappu’ will give good result to the patients.

## **பத்தியம் (Dietary restrictions)**

### **இச்சாபத்தியத்தில் நீக்கும் பொருள்கள்:**

“கடுகு கற்றிலத் தெண்ணெய் கூழ்ப்பாண்டங்கள் கடலை  
வடுவதாகிய தெங்குமர வருக்கை நற்காயம்  
மடிவி லாதவெள்ளுள்ளிகொள் புகையிலை மதுபெண்  
இடறு பாகலே டகத்தி நீக்கிடலிச் சாபத்தியம்.”

- சித்த மருத்துவாங்கச் சுருக்கம்.

கடுகு, எள்ளெய், கலியாண பூசணிக்காய், கள், கடலை, தேங்காய், மாங்காய், பலா, காயம், உள்ளிப்பூண்டு, கொள், புகையிலை, பெண்கள், சேர்க்கை, பாகல், அகத்தி இவைகளை இச்சாபத்தியத்தில் நீக்க வேண்டும்.

“புனிதுவர் விஞ்சும் கறியால் பூரிக்கும் லாதம்”

புளிப்பு, துவர்ப்பு, சுவையுள்ள உணவு வகைகளை நீக்க வேண்டும்.

## **தொக்கணம்**

வாத முதலிய முக்குற்றப் பிணிக்கலப்பால் உண்டாகும். உடல் வலியை நீக்க உடலைப் பிடிப்பது.

இது வெறுங்கையில் தடவிப்பிடிப்பது என இருவகைப்படும்.



## இதன் குணம்

“தொக்கணத்தினை விரத்தந் தேரல் ஊனிவைகட்கு  
மிக்க சவுக்கியஞ்ச மீரணும் பேர - மெய்க்திக  
புட்டியுறக்கம் புணர்ச்சி யிவைகதிக்கும்  
பட்ட அலைச்சலறும் பர்”.

- தேரன் தரு

அழல் கீல் வாயுவில், நோயுள்ள பொருத்துகளை பிடித்தல் முறையில்  
தைலம் தடவியோ, தடவாமலே செய்யலாம்.

Massage therapy can soothe pain, relax stiff muscles, and reduce the swelling that accompanies arthritis. Massage and gentle stretching help maintain a joint's range of motion.

In osteoarthritis, gentle massage can help ease the pain. Start by putting a little vegetable oil or massage oil on your fingertips. Then work slowly around the affected joint, making small, gentle circles with your fingertips. It's best to avoid massage directly on the joint; stay just above and below it with your fingertips. Work on the area around the joint for three to five minutes each day.

Massage is believed to be beneficial effects in several ways. Besides being physically and emotionally relaxing, massage improves blood and lymph circulation, reduces nerve irritation and brings fresh oxygen and other nutrients to the affected tissues. Massage may also cause the body to produce fewer stress hormones like cortisol and norepinephrine (formerly adrenalin), and may also increase the body's production of pain-killing endorphins and the mood-altering hormone serotonin.

## **Yoga Therapy:**

Yoga is a science of consciousness. It is an integrated system of techniques by which we develop our hidden potentials to the fullest. Our qualities of love, joy, security, confidence, discrimination, intelligence, intuition, higher abilities and

awareness, expand as we practice yoga. This is the fundamental aim and use of this ancient system.

A great number of people suffering from various diseases achieved permanent cure through yoga therapy within a period of two to three months from diabetes, arthritis, asthma, gastro – intestinal disorders, nervous tension and various other diseases.

### **Arthritis – In Yogic Treatment:**

1. Yogasanam: Trikonasana, Padmasana, Vajrasana, Gomuthasana, Konasana, Bhujangasana, Shalbasana, Dhanurasana, Halasana, Garudasana, Sarvangasana, Shavasana.
2. Pranayamam.
3. Hot water fomentation. Take bath in hot water in winter.
4. Do general massage with mustard oil on joints.

### **Diet:**

- ❖ Eat Orange, apple or any fruit except banana, germinated gram, chapatti and green vegetables. In lunch and dinner take salad, chapattis, green vegetable, saag etc.
- ❖ Drink 10 glasses of water during the day. Avoid curd, fried food, cold drinks, rice, potato etc.
- ❖ Garlic soup be taken with meals. Rub lemon juice over the affected part.
- ❖ Drink the juice of amala with honey
- ❖ Eat basan with ghee. Don't use salt in it.
- ❖ Lie down and do cycling exercise with legs and hands.
- ❖ Take soaked resins, black resin /guava at 80am
- ❖ Take carrot juice at 11 am
- ❖ Take carrot juice at 3 pm
- ❖ Take salad, boiled vegetables / fruit at 6pm
- ❖ Diet plays an important role in the disease.

### **Other Treatment:**

- ❖ Avoid milk, coffee, sweet meats, gram flour, maida, preparations and greasy food.
- ❖ Application of ghee in navel in clockwise direction with right thumb is useful.
- ❖ Apply ginger juice / garlic juice / castor oil / glycerine on the major joints like knee / elbow / ankle/ wrist a useful.
- ❖ Take lemon juice
- ❖ Apply apple pulp on the affected joints. Take apples also.
- ❖ Burn some garlic cloves in castor oil store in a bottle. Apply at the site of pain.
- ❖ Have positive attitude.
- ❖ Fasting is the best panacea to reduce this disease. In the beginning drink 3 litre hot water mixed with 5 lemon. In case of fever take fresh fruits, vegetable juice and salad for a weak swelling, hardness and joint pain will be removed. Start sprouts, boiled vegetables and come on Roti, Dalia and balance diet.

### **ASANAS:**

#### **1. Padmasanam (Lotus Posture)**

Folding the legs in a manner where soles of both the feet are turned up like the petals of a lotus flower, straighten your spine.

Rhythm : Normal breathing

Duration : 10 minutes

#### **Benefits:**

Preserves normal elasticity and especially helps all the important muscles, ligaments and tendons of the lower extremities.

#### **2. Vajrasanam: (The Adamant pose)**

In kneeling position with upturned feet, place buttocks in cavity formed by keeping the heels apart and maintain spine erect.

Rhythm : Normal breathing

Duration : 5-7 minutes

**Benefits:**

Correct posture, better flexion of ankle and feet, relaxation of thigh muscles, good fixity, helps digestion and breathing, gives relief in back ache, mental conditioning preparatory step to meditation.

**3. Gomukhasanam: (Cow-head pose)**

Try to clasp the fingers of both hands behind shoulder blades, sitting with both legs bent in a manner where knees are overlapping.

Rhythm : Normal breathing

Duration : 5-7 minutes

**Benefits:**

Tones of the muscles, tendons and ligaments of the knees, relieves back ache.

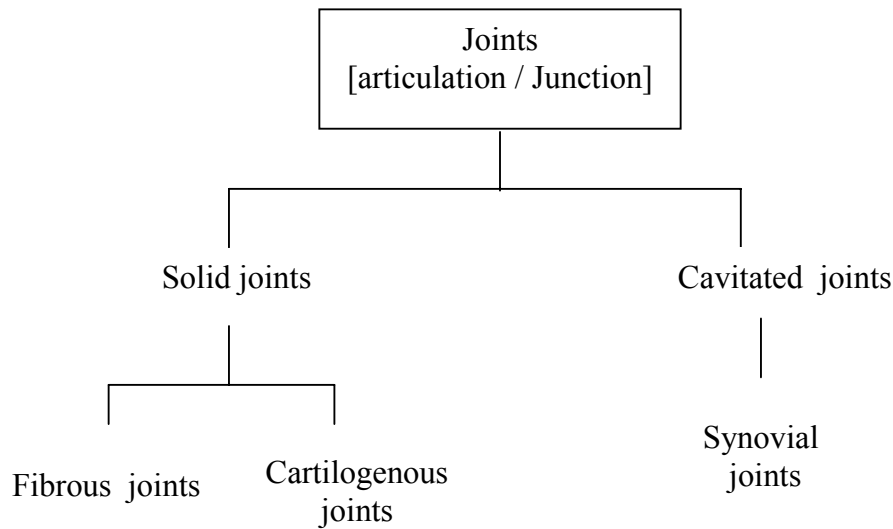
## MODERN ASPECT

### JOINTS:

The place of union or junction between two or more bones of the skeleton is termed as a JOINT.

### Normal structures:

The joints are of two types - diarthrodial or synovial joints with a joint cavity and synesthrodial or non synovial joints without a joint cavity.



Most of the disease of joints affects diarthrodial or synovial joints. In diarthrodial joints, the ends of two bones are held together by joint capsule, ligaments and tendons inserted at the outer surface of the capsule. The articular surfaces of bones are covered by hyaline cartilage which is thicker in weight – bearing areas than in non – weight bearing areas. Few exceptions the temporo – mandibular joints and those involving the clavicle are between the ends or other circumscribed surfaces of endochondral bones.

The joint space is lined by synovial membrane or synovium which forms synovial fluid that lubricates the joint during movement.

The capsule is lined by synovial membrane which also covers all intrarticular surfaces except those in compression contact during activity. These include non-articulating osseous surfaces, tendons and ligaments partly or fully within the fibrous capsule as in the shoulder and knee.

Articular surfaces mostly formed by a special variety of cartilage which has a wear – resistant, low frictional and lubricated surface, slightly compressible and elastic and thus ideally constructed for easy movement over a similar surface but also able to absorb large forces of compression and here generated gravity and muscular power.

#### **Synovial Membrane:**

Synovial membrane lines non-articular areas in synovial joints, bursae, tendon sheaths, all regions where movement occurs between opposed surfaces. Egg-albumin (Synovial) secreted and absorbed by the membrane. It lines fibrous capsule and covers exposed osseous surfaces, intracapsular ligaments and tendons. The synovial membrane is composed of inner layer 1-4 cell thick synoviocytes and outer layer of loose vascular connective tissue. On electron microscopy, two types of synoviocytes are distinguished type A and type B. Type A synoviocytes are more numerous and are related to macrophages and produce degradative enzymes, while type B synthesis and hyaluronic acid.

#### **Synovial Fluid:**

Synovial fluid is a clear, light yellow, viscous fluid, which serves to lubricate the articular surfaces of the joints.

It is a dialysate of the blood plasma with mucin and hyaluronic acid added to the secretions from the synovial cells.

The main functions of the synovial fluid are lubrication and nourishment of the articular cartilages, disc, lubrication and reduction of erosion.

Analysis of the synovial fluid is helpful in diagnosing various types of arthritis by changes in its viscosity, cell content and biochemical features.

### **Approximate Amounts and Ranges of Substances in Synovial Fluid.**

**(Text book of Biochemistry West / Todd / Mason / Vam Breggen)**

1.	Proetin	-	2.89/100g
	Albumin	-	1.99/100g
	Globulin	-	0.9/100g
	Fibrinogen	-	Nil
2.	Aminoacid	-	Nil
3.	Total lipid	-	Nil
4.	Cholesterol	-	Nil
	Fatty acid	-	Nil
5.	Creatinine	-	Nil
	Urea	-	Nil
6.	Glucose	-	65-90mg/100g
7.	Sodium	-	310mg/100g
8.	Potassium	-	310mg/100g
9.	Calcium	-	10mg/100g
10.	Chlorides	-	3.28mg/100g
	Phosphorous inorganic	-	Nil
	CO <sub>2</sub> content (vol %)	-	Nil
	P <sub>H</sub>	-	7.29 - 7.49
	Water	-	96.6 g / 100g.

#### **The Synovial Cavities:**

The joints cavities and the bursae are known as SYNOVIAL CAVITIES. The synovial cavities contain large amounts of mucopolysaccharides much more than normally present in the interstitial fluid. The origin is not known through presumably it is secreted by the surrounding connective tissue cells.

In the synovial cavities excess, proteins are likely to collect in the potential spaces and these must be returned to the circulatory system through the lymphatics, otherwise the space swells.

**Fatty Pads:**

These are present in some synovial joints. These fatty deposits are situated between the synovial membrane and capsule or between the capsule and the bone Eg. Knee Joint.

**Ligament:**

In the large joints they are formed from capsule as a specialized part of the capsule. Eg. Ligaments of the knee joint.

**Bursae:**

They facilitate movements. They may be continuous with the joint cavity eg. suprapatellar bursae of knee joints.

**Articular Disc:**

These may be fibrocartilaginous pads they divide the joint cavity into two compartments.

**Articular cartilage:**

The ends of the bones in synovial joints are covered with a layer of articular cartilage. This avascular tissue that consists of cartilage cells (Chondrocytes) embedded in a thick matrix of proteoglycans, water, type II collagen and smaller amount of other proteins.

The most wide spread type of cartilage is hyaline cartilage which covers the articular surface of bones. Articular cartilage is a smooth glistening resilient of a hyaline cartilage. Articular cartilage distributes load across joints minimizing the peak stresses on subchondral bone.



## **Composition of Articular Cartilage:**

### **Fibrous Components:**

Collagen accounts for more than half the dry weight of adult human articular cartilage.

### **Water:**

The water content of the articular cartilage constitutes approximately 75% of the net weight.

### **The Ground Substance:**

1. Protein Polysaccharide Complexes (PPC)
2. Glycosaminoglycans (GAG)
  - Chondroitin sulphate 45-75% Keratan sulphate 50%

### **Extracellular lipid:**

Lipid constitutes about 1% of the net weight.

### **Zones of articular cartilage:**

#### **1. Superficial layer (tangential zone)**

Makes up 10% of cartilage

Two Sub Zones

- a. Fibrillar sheet – most superficial layer

Clear film consisting of a sheet of small fibrils with little polysaccharide and no cells.

- b. Cellular layer with flattened chondrocytes:

Flat chondrocytes and collagen fibers are arranged tangentially to the articular surface.

Thinnest layer, with the highest content of collagen and the lowest concentration of proteoglycans.

Collagen (type IX) is arranged at right angles to adjacent bundles and parallel to the articular surface.

Subsequently has greatest ability to resist shear stresses and serves as a gliding surface for joint.

May also function to limit passage of large molecules between synovial fluid and cartilage.

Superficial zone is the first to show changes of osteoarthritis.

## **2. Transitional layer:**

This zone involves transition between the shearing forces of superficial layer to compression forces in the cartilage layers.

- ❖ composed almost entirely of proteoglycans
- ❖ Spherical chondrocytes
- ❖ Less strongly bound.

## **3. Deep radial layer:**

- ❖ Largest part of the articular cartilage
- ❖ It distributes loads and resists compression
- ❖ Collagen fibres and chondrocytes are perpendicular to subchondral plate

## **4. Calcified cartilage layer**

- ❖ Contains the tidemark layer
- ❖ Tidemark is basophilic line which straddles the boundary between calcified and uncalcified cartilage.
- ❖ Separate hyaline cartilage from subchondral bone.
- ❖ Type X collagen is present mainly in the calcified cartilage layer and in hypertrophic zone of the growth plate.

## **ANATOMY OF KNEE JOINT**

The knee joint is the largest and most complex joint of the body. The complexity is the result of fusion of three joints in one. It is formed by fusion of the lateral femorotibial, medial femorotibial and femoropatellar joints. Thus the knee joint is formed by condyles of femur, condyles of tibia and patella. The structures are briefly discussed here.

### **LIGAMENTUM PATELLAE:**

**Origin:** Apex of the patella, upper half of tuberosity of the tibia.

It is the degenerated tendon of insertion of quadriceps femoris. It is separated from the synovial membrane of knee joint by the infrapatellar pad of fat.

### **MEDIAL TIBIAL COLLATERAL LIGAMENT:**

**Origin:** Medial epicondyle femur, medial margin and the adjoining medial surface of the tibia.

It is the degenerated tendon of insertion of adductor magnus muscle.

### **LATERAL FIBULAR COLLATERAL LIGAMENT:**

**Origin:** Lateral epicondyle of femur, head of fibula closed to the styloid process.

Laterally, it contains the degenerated origin of the peroneus longus muscle.

### **OBLIQUE POPLITEAL LIGAMENT:**

This is an expansion of insertion of semi-membranous muscle.

### **ARCULATE POPLITEAL LIGAMENT:**

This is a Y-shaped posterior expansion from the short lateral ligament.

### **CRUCIATE LIGAMENT:**

These fibrous bands are intracapsular but extra synovial structures. The anterior and posterior cruciate ligaments cross each other within the joint cavity

from intercondylar notch of femur to the intercondylar eminence of tibia to maintain anteroposterior stability of the knee joint.

### **SEMILUNAR CARTILAGES:**

There are two fibrocartilagenous crescentric shaped discs called menisci (medial meniscus and lateral meniscus), which deepen the articular surfaces of the condyles of tibia. They stabilize the joint by preventing lateral displacement of bones. Compositional changes occur with ageing and degeneration within the menisci; these reduce the ability to resist tensional forces.

### **Functions:**

1. To make the tibial articular surfaces more concave and wider
2. To absorb the shocks received by the joint
3. To fill up the dead space within the joint cavity during movements.
4. To spread the synovial fluid evenly on the articular surface.
5. They also have a sensory function. These menisci are not covered with synovial membrane.

### **TRANSVERSE LIGAMENT:**

This fibrous tissue connects anterior ends of medial and lateral semilunar cartilages.

### **SYNOVIAL MEMBRANE:**

This lines the inner surface of the capsule except posteriorly where it is reflected towards by the cruciate ligaments. The membrane enters the joint on either sides of the cruciate ligaments and ends of the menisci and making them intracapsular but extra synovial structures. In front, it is prolonged upwards as the supra-patellar bursa.

### **FIBROUS ARTICULAR CAPSULE:**

This capsule is very thin and is deficient anteriorly, where it is replaced by quadriceps femoris, the patella and the ligamentum patellae. The Synovial membrane of the joint extends above the patella through this opening and the extension is called as supra patellar bursa.

### **BURSAE AROUND THE KNEE:**

As many as 13 bursae have been described around the knee; four in anterior, four in lateral and five in medial.

### **BLOOD SUPPLY:**

The knee is supplied by the anastomosis around it. The chief sources are;

- ❖ Five genicular branches of popliteal artery
- ❖ The descending genicular branch of the femoral artery
- ❖ The descending branch of the lateral circumflex femoral artery
- ❖ Two recurrent branches of anterior tibial artery
- ❖ The circumflex fibular branch of posterior tibial artery

### **NERVE SUPPLY:**

- ❖ Femoral nerve
- ❖ Genicular branches of common peroneal nerve
- ❖ Genicular branches of tibial nerve
- ❖ Descending genicular branch of posterior division of the obturator nerve.

### **Classification of Joint Disease:**

Infective Arthritis (Bacterial, Viral, Parasite)

#### **Acute Infection:**

1. Acute pyogenic Arthritis
2. Acute Gonococcal Arthritis
3. Acute Rheumatic Arthritis
4. Small pox Arthritis

### **Chronic Infection:**

1. Non specific
  - a. pyogenic arthritis
2. Specific
  - a. Tubercular arthritis
  - b. Syphilitic arthritis
  - c. Gonococcal arthritis

### **3. Parasitic Infestation:**

- a. Guinea worm arthritis

## **II. Rheumatoid Arthropathy:**

### **Rheumatoid Arthritis:**

1. Rheumatoid arthritis (RA) Adult
2. Juvenile Rheumatoid arthritis

### **Sero Negative Spondylo Arthropathy:**

1. Ankylosing spondylitis
2. Reiter's disease
3. Psoriatic Arthritis

## **III. Degenerative Arthritis (Osteoarthritis, Osteo Arthrosis, Hypertrophic arthritis)**

Generalised

Localised

Secondary to previous trauma

Secondary to structural abnormality

Secondary to RA

Cause unknown

## **IV Neuropathic Arthropathy:**

Tabes – Charcots's Arthropathy

Syringomyelia

Leprosy

Diabetes Mellitus

**V. Metabolic Arthritis:**

Alkaptonurine Arthritis

Gout

**VI. Arthritis in systemic disorder:**

Allergic arthritis

Haemophilic arthritis

**VII. Miscellaneous Joints:**

Vilo –nodular synovitis

Synovial chodromatosis

**VIII. Neoplasms of Joints:**

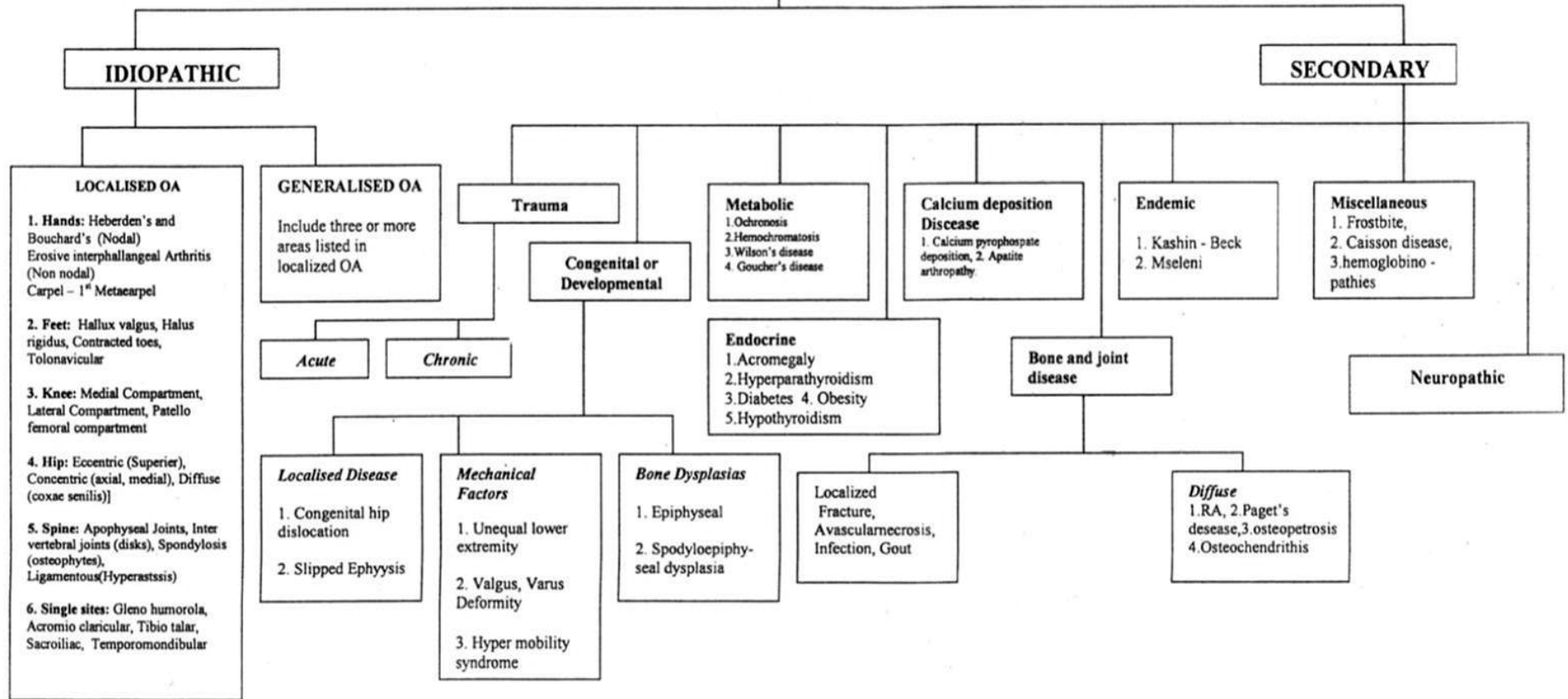
(Cyst, Xanthoma, Haemangioma, Giant cell tumour, synovioma)

**IX. Traumatic arthritis:**

Direct trauma

Indirect trauma (Secondary to postural strain)

# OSTEO ARTHRITIS





## OSTEOARTHRITIS

### **Synonym:**

Osteo arthrosis, degenerative arthritis, chondromalacia arthritis, hypertrophic arthritis, Arthritis deformans, post traumatic arthritis.

These terms are used to refer degenerative joint disease Osteoarthritis.

### **Definition:**

Osteoarthritis is currently used to define an idiopathic, slowly progressive disease of diarthrodial (synovial) joints occurring late in life and characterized pathologically by focal degeneration of articular cartilage, subchondral bone thickening (sclerosis) marginal osteo chondral outgrowths (osteophytes) and joint deformity.

### **Principle site of Osteoarthritis:**

Osteoarthritis preferentially targets only certain small and large joints, the knee and hip are the principal sites of significant disability. Knee osteoarthritis is more prevalent than hip OA.

### **Etiology:**

It is caused due to wear and tear. If a joint were never put under stress, it would never become osteoarthritis. Hence the relatively lightly stressed joints of the upper limb are in general less proving to osteoarthritis than the heavily stressed joints of the lower limb.

### **Predisposing factor:**

#### **1. Age**

<45 years	-	had 2% OA.
45-64 years	-	30%
> 65 years	-	68%

Men and women are equally affected. The disease is more severe and more generalized in women.

**Hereditary:**

An epidemiologic study suggests that OA is an articular expression of a generalized constitutional condition resulting from inherited metabolic abnormalities.

**Obesity (increase mechanical stress):**

Plays a larger role in the etiology of the most serious cases of knee OA. It mainly affects the weight bearing joints. It affects generalized pattern more typical in women than men.

**Areas of involvements**

In women, a more generalized involvement is usual in the distal interphalangeal joints and first carpometacarpal joints are often affected. Men, the hips are commonly involved.

**Major trauma and repetitive joint use:**

Anterior cruciate ligament injury, meniscus damage (also meniscectomy), articular cartilage damage leads to knee OA.

Trimalleolar fracture will certainly develop ankle OA.

**Occupation:**

Hip OA common in farmer.

Elbow OA in jack hammer operator.

Hand OA in cotton mill workers.

**Sports activities:**

Ankle OA common in ballet dancers.

Elbow OA, OA of shoulders in baseball pitchers.

Metacarpophalangeal joint OA in prize fighters.

Knee OA in footballer.

Prolonged standing, bending, walking long distances over rough ground, lifting and moving heavy objects appear to increase the high risk of hip OA.

**Development deformities:**

Anatomical abnormalities of the knee and hip that are present at birth or that develop during childhood may result in accelerated or premature OA.

These abnormalities include genuvarum, genuvalgum, congenital hip subluxation, slipped capital femoral epiphysis and acetabular dysplasia.

**Prior Inflammatory Joint Disease:**

Rheumatoid arthritis and septic arthritis may progress to OA.

**Nutritional Deficiencies:**

Low Vitamin D and Vitamin C intake is associated with increased risk of knee OA progression.

**Metabolic and Endocrine Disorder:**

Acromegaly notably affects cartilage.

Somatotropin stimulates chondrocytes, resulting in acceleration and intensification of metabolic activity. As ages advance, somatotropin deficiency becomes pronounced and in chondrocytes regressive changes and reduced metabolic activity ensue.

Diabetics show progressive abnormalities of chondrocytes and diabetics are uniquely susceptible to OA.

**Chemical Injury:**

Systemically or locally administered chemical agents affect the viability and metabolic activity of articular cartilage chondrocytes (e.g. steroids)

**Repeated Intra Synovial Haemorrhage:**

In patients with defective clotting factors, repeated haemorrhage can lead to damage to articular cartilage and to subchondral bone structures. Iron and pigment in matrix may alter the physical and chemical properties of cartilage, or the chondrocytes engulf large quantities of iron pigment within their cytoplasm perhaps causing lysosomal release of degradative enzymes.

It has been shown that the prostaglandin concentration is diminished and synthetic activities of the chondrocyte are depressed.

**Arthritis:**

Arthritis can occur as a result of an imbalance between mineralocorticoids and glucocorticoids.

**Heritable Metabolic Cause:**

Eg. Alkaptonuria, Hemochromatosis, Wilson disease

**Hemoglobinopathies:**

Eg. Sickle cell disease, Thalassemia.

**Neuropathic Disorder Leading to a Charcot Joint**

Eg. Syringomyelia, Tabes Dorsalis, Diabetes.

**Disorders of Bone**

Eg. Paget Disease, Avascular Necrosis.

**Classification**

Primary OA.

Secondary OA.

**Primary OA:**

No previous pathology

It is due to wear and tear changes occurring in old age in which weight bearing joints like hips and knees are commonly affected.

**Secondary OA:**

Secondary to some previous pathology

It is due to an abnormal wear and tear in a joint caused by mechanical incongruity of the articular surfaces.

This incongruity may be the result of a preceding fracture involving the articular surface or partial destruction or deformity due to a previous disease.

**a) Group I Crystal Deposition Type:**

Hyperparathyroidism

Haemochromatosis

Wilson's disease

Gout

Oxalosis

Calcium pyrophosphate deposition disease

Calcium phosphate deposition disease.

**b) Group II Necrosis or abnormality in the subchondral bone**

Post traumatic OA

Aseptic necrosis

Leg – perthes disease

Paget's disease

Steroid arthropathy

**c) Group III Abnormal joint laxity**

Eclers Danlos syndrome

Osteogenesis imperfecta

**d) Group IV abnormal cartilage growth or function**

Acromegaly

Achondroplasia

Spondylo epiphyseal dysplasias

Mutiple epiphyseal dysplasias

Congentital hip dysplasia

Mucopolysacchoridoses,

Ochrnosis.

Diabetes mellitus.

**e) Group V synovial destructive of cartilage and bone**

Post inflammatory OA

Post infection OA

Haemophilic arthropathy

## **PATHOLOGY**

The cardinal features are:

- ❖ Progressive cartilage destruction
- ❖ Sub articular cyst formation
- ❖ Sclerosis of the surrounding bone
- ❖ Osteophyte formation
- ❖ Capsular fibrosis
- ❖ Joint mice or loose bodies

The weight bearing joints such as hips, knee and vertebrae are most commonly involved but interphalangeal joints of fingers may also be affected

Initially the cartilaginous and bony changes are confined to one part of the joint, the most heavily loaded part. There is softening and flaking or fibrillation, of the normally smooth and glistening cartilage. The term chondromalacic (Greek cartilage-softening) seems apt for this stage of the disease, but it is used only for the patellar articular surface where it features are one of the cause of anterior knee pain in young people.

With progressive disintegration of cartilage, the underlying bone becomes exposed and some of the areas may be polished, or burnished, to ivory like smoothness. Sometimes small tufts of fibro cartilage may be seen growing out of bony surface. At a distance from the damaged area the articular cartilage looks relatively normal, but at the edges of the joint there are bony excrescence covered by thin bluish cartilage the osteophytes.

When the sub articular bone is cut through, this additional features come to light. Beneath the damaged cartilage the bone is dense and sclerotic. Often with in the area of subchondral sclerosis, and immediately subadjacent to the surface, are one or more cysts containing thick gelatinous material.

The joint capsule usually shows thickening and fibrosis, sometimes to extraordinary degree. The synovial lining, as a rule, looks only mildly

inflamed; at the same times, however, it is thick and red and covered by villi.

The histological appearance varies considerably, according to the degree of destruction. Early on, the cartilage shows small irregularities or splits in the surface, while in the deeper layers there is patching loss of metachromasia obviously corresponding to the depletion of matrix proteoglycans. Most striking however, is the increased cellularity and the appearance of clusters or clones of chondrocytes-20 or more to a patch. In later stages, the clefts become more extensive and in some areas cartilage is lost to the point where the underlying bone is completely denuded.

The subchondral bone is thickened and may show marked osteoplastic activity especially in the deeper aspect of any cyst. The cyst itself contains amorphous material; its origin is mysterious; it could arise from stress disintegration of small trabeculae from focal areas of osteonecrosis or from the forceful pumping of synovial fluid through cracks in the subchondral bone plate. As in all types of arthritis small areas of osteonecrosis are quite common. The osteophytes are seen to arise from the edge of the articular surface as bony outgrowth covered by hyaline cartilage.

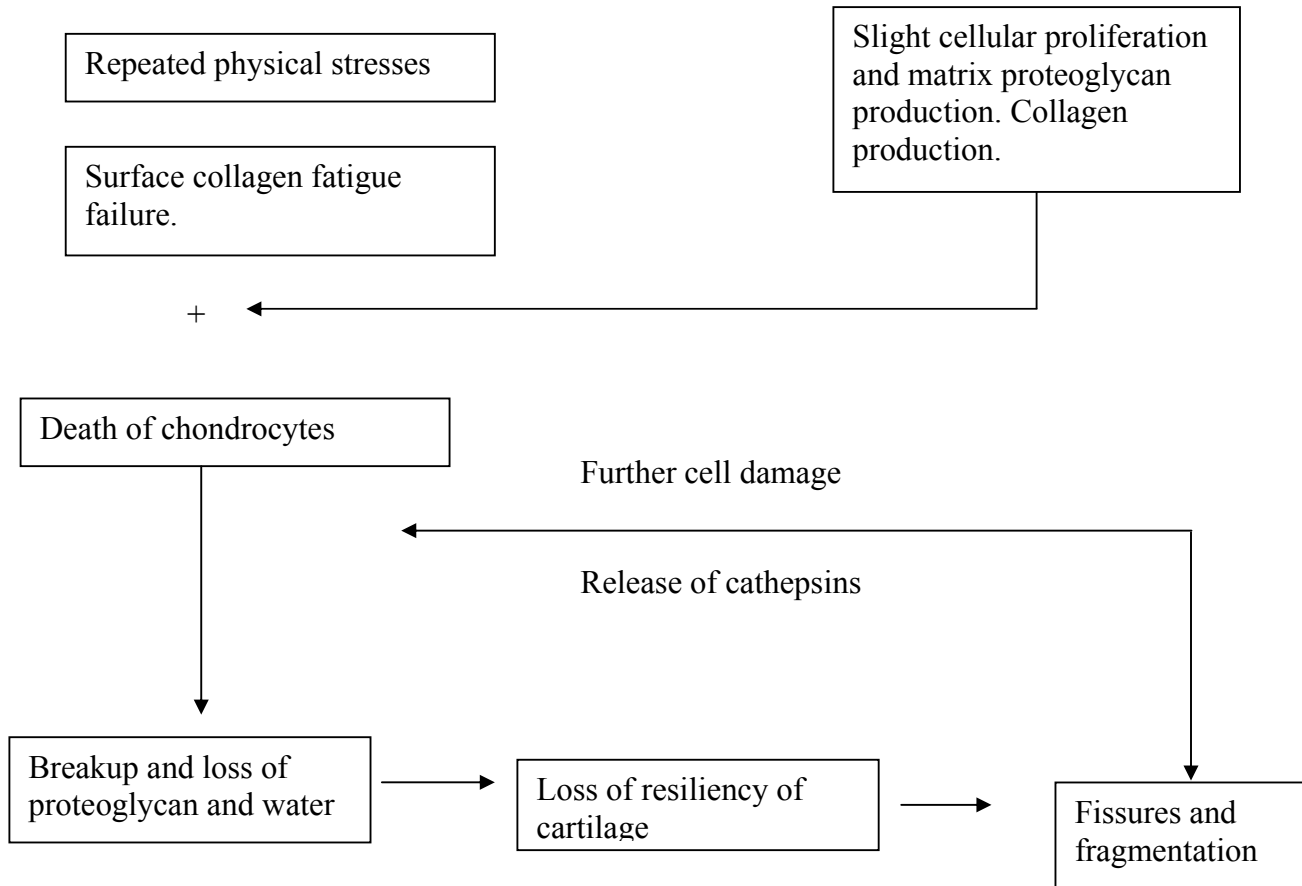
The capsule and synovium are often thickened but cellular activity is slight however, some times there is marked inflammation or fibrosis of the capsular tissues.

A feature of osteoarthritis, which is difficult to appreciate from the morbid anatomy, is the marked vascularity and venous congestion of the sub chondral bone.

This may be shown in angiographic studies and the demonstration of increased intraosseous pressure. It is also apparent from the intense activity around osteoarthritic joints on radionuclide scanning.

## PATHOPHYSIOLOGY

### STEPS IN ARTICULAR CARTILAGE BREAKDOWN IN OA



External forces accelerate the catabolic effects of the chondrocytes and disrupt the cartilaginous matrix.

Enzymatic destruction increase cartilage degradation, which is accompanied by decreased proteoglycans and collagen synthesis. Changes in the proteoglycans render the cartilage less resistant to compressive forces in the joint and more susceptible to the effects of stress. Glycosaminoglycans are modified qualitatively and they become shorter as the cartilage ages. The concentration of type 6 keratan sulphate increase during aging, to the detriment of type 4 keratan sulphate.



The change in proteoglycans reduce the capacity of the molecules to retain water, which alters the biochemical properties of the cartilage

The decreased strength of the cartilage is compounded by adverse alterations of the collagen. Elevated levels of collagen degradation place excessive stresses on the remaining fibers, eventually leading to mechanical failure. The diminished elastic return and reduced contact area of the cartilage, coupled with the cyclic nature of joint loading, causes the situation to worsen over time.

Articular cartilage has an important role in distributing and dissipating the forces associated with joint loading. When it loses its integrity these forces are increasingly concentrated in the subchondral bone. This results in focal trabecular degeneration and cyst formation, as well as increased vascularity and reactive sclerosis in the zone of maximal loading.

Microscopically, flaking and fibrillations develop along the normally smooth articular cartilage surface. The loss of cartilage results in the loss of the joint space. Progressive erosion of the damaged cartilage occurs until the underlying bone is exposed. Bone denuded of its protective cartilage continues to articulate with the opposing surface. Eventually, the increasing stresses exceed the biomechanical yield strength of the bone. The subchondral bone responds with vascular invasion and increased cellularity becoming thickened and dense (eburnation) at areas of pressure.

Furthermore, the traumatized subchondral bone may undergo cystic degeneration, due to either osseous necrosis secondary to chronic impaction or the intrusion of synovial fluid. At nonpressure areas along the articular margin, vascularization of subchondral marrow, osseous metaplasia of synovial connective tissue, and ossifying cartilaginous protrusions lead to irregular outgrowth of new bone (osteophytes). Fragmentation of these osteophytes or of the articular cartilage itself results in intra-articular loose bodies (joint mice).

**Clinical Features:**

Patients usually present after middle age. Joint involvement follows several different patterns; symptoms centre either weight bearing joints (Hip or Knee) or the interphalangeal joints (Especially in women) or on any joint that has suffered a previous application (Eg, congenital dysplasia, osteonecrosis or intra-articular fracture). A family is common in patients with polyarticular osteoarthritis.

**Pain** is the usual presenting symptom it is often quite wide spread, or it may be experienced at a distant site-for example, pain in the knee from osteoarthritis referred to the hip. It usually starts insidiously and increases slowly over months of years. It is aggravated by exertion and relieved by rest although with time relief is less and less complete. The pain is worst in bed at night, when the patient has difficulty finding at any position of comfort.

**Causes of Pain:**

Since articular cartilage is aneural, the joint pain in OA must arise from other structures.

- Due to stretching of nerve endings in the periosteum covering osteophytes.
  - May arise from micro fractures in subchondral bone.
  - From medullary hypertension caused by distortion of blood flow by thickened subchondral trabeculae.
  - Stretching of joint capsule due to joint instability.
  - Muscle spasm.
  - Synovitis.
- ❖ Palpation may reveal some warmth over the joint.
  - ❖ Periarticular muscle atrophy may be due to disease or due to reflex inhibition of muscle contraction.
  - ❖ In the advanced stages of OA, there may be gross deformity, bony hypertrophy subluxation and marked loss of joint motion.

### **Causes of Pain in the Joints in Patients with OA:**

<b>Source</b>		<b>Mechanism</b>
Synovium	-	Inflammation
Subchondral bone	-	Medullary Hypertension, Micro fractures.
Osteophyte	-	Stretching of periosteal Nerve endings.
Ligaments	-	Stretch.
Capsule	-	Inflammation, Distention.
Muscle	-	Spasm.

**Stiffness** is common: characteristically it occurs after periods of inactivity but with time it becomes constant and progressive.

**Swelling** may be intermittent (suggesting an effusion) or continuous with capsular thickening or large osteophytes.

**Deformity** may result from capsular contracture or joint instability but beware; it may have preceded and contributed to the onset of osteo arthritis.

**Loss of function** though not most dramatic, is often the most distressing symptom. A limp, difficulty in climbing stairs, restriction of walking distance, or progressive inability to perform everyday tasks or enjoy recreation may eventually drive the patient to seek help.

Typically, the symptoms of osteo arthritis follow an intermittent course with periods of remission sometimes lasting for months.

Although the patient complains of only one or two joints, examination may show that others are affected in varying degrees.

Swelling and deformity may be obvious in peripheral joints at the hip, deformity is usually marked by postural adjustments of the pelvis and spine. In long standing cases, there is muscle wasting. Tell-tale scars denote previous abnormalities. Local tenderness is common and in superficial joint fluid, synovial thickening or osteophytes may be felt.

Movement is always restricted, but is often painless within the permitted range; it may be accompanied by crepitus. Some movements are more curtailed than others; thus at the hip extension, abduction and internal rotation are usually the most severely limited.

In the late stages joint instability may occur for any of three reasons” loss of cartilage and bone; asymmetrical capsular contracture; and muscle weakness.

#### **OA at specific joint sites:**

##### **Erosive OA:**

Distal and /or proximal interphalangeal joints of the hands are most prominently affected. Erosive OA tends to be more destructive than typical nodal OA.

##### **Nodal generalized OA**

It is characterized by

- ❖ Polyarticular – interphalangeal joint (IPJ) OA
- ❖ Heberdens ( $\pm$  Bouchards) node
- ❖ Marked female preponderance
- ❖ Peak onset in middle age
- ❖ Good functional outcome for hands
- ❖ Predisposition to OA at other joint (especially at knee)
- ❖ Strong genetic predisposition.

**Age Group:**

Middle age women in forties or fifties.

**Symptoms:**

Pain, stiffness and swelling of one or few fingers IPJs.

Gradually over many months, more finger IPJs (distal > proximal) are recruited. Affected joints develop posterolateral swellings each side of the extensor tendon. They slowly enlarge and harden to become Heberden's (distal IPJ) and Bouchard's (proximal IPJ) node.

Typically each joint goes through a phase of episodic symptoms (1-5 years). While the node evolves and OA develops in the underlying IPJ.

Once fully established, however symptoms usually subside and hand function often remains relatively unimpaired. Affected IPJs often show characteristic lateral deviation reflecting the asymmetric focal cartilage loss of OA.

Involvement of first, carpometacarpal joint is also common. At this site marked osteophyte and subluxation may result in "thumb base squaring". Thumb base OA occasionally causes more chronic symptoms and functional impairment than IPJ OA.

People who develop nodal OA are at increased risk of subsequently developing OA at other sites generalized OA especially at the knee.

Nodal generalized OA has a very strong genetic predisposition. Daughters of a affected mother has one in three chance of developing nodal OA. Nodal OA with multiple nodes and symptom onset in middle age. Others have a prolonged symptom phase and overt IPJ inflammation and IPJ instability in some fingers, with subchondral erosion on radiograph.

**Thumb Base:**

The second most frequent area of involvement of OA is the thumb base. Swelling, tenderness, and crepitus on movement of the joint are typical. Osteophytes may lead to a “squared” appearance of the thumb base.

**The Hip:**

Congenital or developmental defects (Eg. Acetabular dysplasia, slipped capital epiphysis) may be implicated in as many as 80 percent of cases of hip OA.

**The Knee:****Main targets**

- i. Patello femoral compartment
- ii. Medial tibiofemoral compartment

Trauma is important risk factor in men and is unilateral OA. In women OA is bilateral and symmetrical.

OA on the medial compartment may result in a varus, (bow-leg) deformity; in the lateral compartment it may produce a valgus (knock-knee) deformity. A positive “shrug” sign (pain when the patella is compressed manually against the femur during quadriceps contraction) may be a sign of patellofemoral OA.

Chondromalacia patellae, which is also characterized by anterior knee pain and a positive shrug sign, is a syndrome of patellofemoral pain, often bilateral, in teenagers and young adults. It is more common in females than in males. It may be caused by a variety of factors (e.g., abnormal quadriceps angle, patella alta, trauma). Although exploration of the knee may reveal softening and fibrillation of cartilage on the posterior aspect of the patella, this change is usually not progressive; chondromalacia patellae is usually not a precursor of OA.

**Symptoms:**

Knee OA pain is localised to the anterior and medial aspect of the knee and upper tibia.

Patello – femoral pain is worse in when they up and down stairs or inclines.

Posterior knee pain suggests a complicating popliteal cyst.

**Functional difficulties:**

Prolonged walking, rising from a chair, getting in and out of a car, or bending to put on shoes and socks.

**Local examination findings:**

- ❖ A jerky asymmetric antalgic gait – less time weight – bearing on the painful side.
- ❖ A varus, less commonly valgus and or fixed flexion deformity.
- ❖ Joint – line and or periarticular tenderness (secondary anserine bursitis and medial ligament enthesopathy are common, giving tenderness of the upper medial tibia).
- ❖ Weakness and wasting of the quadriceps muscle.
- ❖ Restricted flexion/ extension with coarse crepitus.
- ❖ Bony swelling around the joint line.

It is at knee there is predisposition of calcium pyrophosphate dihydrate (CPPD) crystal deposition in OA, Crystal deposition results in over inflammatory component stiffness effusions and superadded acute attacks of synovitis.

These crystal deposition causes more radiographic progression and a worse clinical outcome.

OA of the knee may involve the medial or lateral femorotibial compartment and/or the patellofemoral compartment.

## **The Spine:**

Degenerative disease of the spine can involve the apophyseal joint, intervertebral discs, and/or paraspinous ligaments. Symptoms of spinal OA include localized pain and stiffness. Nerve root compression by an osteophyte blocking a neural foramen, prolapse of a degenerated disc, or subluxation of an apophyseal joint may cause radicular pain and motor weakness.

## **YOUNG – ONSET OA**

- ❖ <45 years of age
- ❖ Single joint
- ❖ Previous overt trauma

## **Causes of young onset OA ie below 45 years**

### **Mono – arthritis**

- ❖ Previous trauma
- ❖ Localised instability

### **Pauci – articular or Poly articular**

- ❖ Prior joint disease (Juvenile idiopathic arthritis)
- ❖ Metabolic or Endocrine disease
- ❖ Late avascular necrosis
- ❖ Neuropathic joints
- ❖ Endemic OA.

## **Imaging:**

### **Radiological Appearances of OA**

#### **1) Joint Space Narrowing**

The width of the joint space seen radiologically is due to the radiolucent cartilage. Joint space narrowing is due to cartilage destruction often occurs in areas of excess weight bearing.



## **2) Joint Space Remodeling**

Joint narrowing due to cartilage destruction and is followed by loss of underlying bone in stressed areas and formation of new bone and cartilage in nonstressed areas and at joint margins.

It is due to.

- i. Stress induced new bone formation
- ii. Trabecular collapse
- iii. Flattening and sclerosis

## **3) New Bone Formation:**

New bone found in areas of low stress at the joint margin leads to formation of -peripheral osteophytes or within the joint central osteophytes.

## **4) Loose Bodies:**

It is formed by detachment of osteophytes or crumbling of articular surfaces or ossification of cartilage debris.

When OA results in pain and immobility, osteoporosis and soft tissue wasting may result secondarily.

## **Knee OA - Radiological Appearances**

The bone commonly involved in OA is patella. Joint space narrowing, osteophytosis and articular irregularity can be seen at the patellofemoral compartment on the lateral and skyline views.

The lateral view also shows a scalloped defect of the anterior distal femur.

Spiking of tibial spines and osteophytes on the articular margins. Joint space narrowing affecting one or other compartments results in valgus or varus deformity, best seen in AP views, with gross buttressing osteophytes on the side of narrowing. Varus deformity is more common due to medial meniscus abnormality.

## **CT & MRI findings**

Osteophytes, erosions, and cysts are demonstrated well in C.T. investigation.

MRI Cartilage loss and subcartilagenous bone edema, cyst and necrosis are will demonstrated.

Loose bodies in the joint space and effusion are well demonstrated

Osteophytes are well shown.

Capsular thickening and plicae and extracapsular changes in collateral ligament and tendons are all probably better seen than by any other means.

## **Laboratory Findings:**

No laboratory studies are diagnostic for OA, but specific laboratory testing may help in identifying one of the underlying causes of secondary OA. Because primary OA is not systemic, the erythrocyte sedimentation rate, serum chemistry determinations, blood counts, and urine analysis are normal. Analysis of synovial fluid reveals mild leukocytosis (<2000 white blood cells per microlitre), with a predominance of mononuclear cells. Synovial fluid analysis is of particular value in excluding other conditions, such as calcium pyrophosphate dehydrates (CPPD) deposition disease, gout, or septic arthritis.

## **Complications:**

1. Capsular herniation: OA of the knee is sometimes associated with a marked effusion and herniation of the posterior capsule (Baker's cyst).
2. Loosebodies: Cartilage and bone fragments may give rise to loose bodies, resulting in episodes of locking.
3. Rotator cuff dysfunction: OA of the acromio clavicular joint may cause rotator cuff impingement, tendonitis or cuff puncture.

4. Spinal stenosis: Long standing hypertrophic OA of the lumbar apophyseal joints may rise to acquire spinal stenosis.
5. Spondylolisthesis: In patients over 60 years of age, destructive OA of the apophyseal joints may result in severe segmental instability and spondylolisthesis (degenerative spondylolisthesis) which almost always occurs at L4, L5.

**Clinical variants:**

**1. Monoarticular and pauciarticular OA:**

Underlying abnormality acetabular dysplasia, old perthe's disease or slipped epiphysis, a previous fracture or damage to ligments or menisci.

**2. Polyarticular OA:**

Pain, swelling and stiffness of the finger joints the first carpometocarpal and big toe metatarsophalangeal joints or the knees and lumbar facet joints may be affected.

Long standing cases, osteophytes and soft tissue swelling produce a characteristic knobbly appearance of the distal inter phalangeal joints (Heberden's node) and less often the proximal interphalangeal joints (Bouchard's nodes).

**3. Endemic OA:**

OA occasionally occurs as endemic disorder affecting entire communities. It may either due to some environmental factor peculiar to that region or to an underlying generalized dysplasia in a genetically isolated community.

**4. Neuropathic joint disease (Charcot's disease):**

The most destructive arthroplasty is that associated with lack of pain sensibility and position sense.

## **Differential Diagnosis of OA:**

### **1. Avascular Necrosis:**

Idiopathic necrosis causes joint pain and local effusion. Early on the diagnosis is made by MRI. Once bone destruction occurs the X-ray changes can be mistaken for those of OA; The cardinal distinguishing feature is that in osteonecrosis the 'point space' (articular cartilage) is preserved in face of progressive bone collapse and deformity.

### **2. Inflammatory Arthropathies:**

RA, Ankylosing spondylitis and Reiter's disease may start in one or two large joints. X-rays show a predominantly atrophic or erosive arthritis.

### **3. Polyarthritis of the Fingers:**

Polyarthritis OA may be confused with other disorders which affect the finger joints. 'Nodal OA' affects predominantly the distal joints, "Rheumatoid Arthritis" the proximal joints and "Psoriatic arthritis" is a purely destructive arthropathy and there are no inter phalangeal nodes. Tophaceous gout may cause knobby fingers, but the knobs are tophi, not osteophytes.

## **PROGNOSIS**

The prognosis in osteoarthritis is governed by the three factors.

1. The cause of the condition.
2. The joint affected.
3. The state of the cartilage.

## **Management:**

The management of OA depends upon the joint involved, the stage of the disorder, the severity of the symptom, the age of the patient and his or her functional needs.

## **TREATMENT FOR OSTEO ARTHRITIS**

In planning treatment, three observations should be borne in mind.

1. **Symptoms** characteristically wax and wane and pain may subside spontaneously for a long period.
2. Some forms of Osteo arthritis (e.g. Herberden's nodes) actually become less painful with the passage of time and the patient may need no more than reassurance and a prescription for pain killers.
3. At the other extreme, the recognition (from serial X-rays) that the patient has a rapidly progressive type of Osteo arthritis may warrant an early move to reconstructive surgery before bone loss comprises the outcome of any operation.

### **Early Treatment:**

#### **Aims of Treatment**

1. To control pain
2. To prevent further strain or damage to affected joints.
3. To improve movements
4. To improve muscle power
5. To maintain or improve functional independence
6. To reduce load
7. Modify daily activities.

### **Conservative Treatment:**

1. **Pain Relief:** Analgesics and non-steroidal anti-inflammatory agents may control pain for many years. Cut overmedication with powerful anti-inflammatory drugs must be avoided there is some evidence that it may accelerate articular destruction. Measures to provide local warmth usually

give only short-lived relief. Rest periods and modification of activities may be necessary.

**Rest:** The involved joints are rested to reduce compression and shear stresses and allow the synovial inflammation to subside.

2. **Range of motion:** The joint is moved through a full range of motion several times daily to prevent capsular contraction.
3. **Load reduction:** protecting the joint from excessive load may slow down the rate of cartilage loss. Measures such as weight reduction for obese patients, wearing shock-absorbing shoes, avoiding activities like climbing stairs and using a walking stick will pay excellent dividends.
4. **Traction:** Traction is used slowing the acute inflammatory phase, particularly of a weight bearing joint. To separate the joint surfaces and to stretch the contracted capsule until the inflammation subsides.
5. **Physical therapy:** Moist heat is followed by massage and range of motion exercises, both passive and active. Painful Heberden's nodes are aided by plain hot water soaks or paraffin applications.
6. **Cold:** The application of cold is often more effective than heat. Ice packs or ice techniques are useful.
7. **Body mechanics:** Good body mechanics is aided by eliminating faulty posture, applying shoe supports, and performing graduated exercises of all joints.
8. **Orthopaedic appliances:** A removable plaster splint secures rest and permits daily physical therapy. An ordinary elastic bandage applied around the affected joint restricts the extremes of motion while permitting a little use.
9. **Ultra sound:** This is indicated when pain is centered on peri articular soft tissues.

**10. X-ray therapy:** This is supposedly acts by reducing inflammation and minimizing scar tissue formation.

**11. Warm, Dry climate.**

**12. Metallization:** A programme of exercise is important. Early on, pain is felt mainly at the extremes of movement, and so increasing the range (by exercise or gentle manipulation) reduces capsular strain.

**13. Intermediate:** If symptoms and signs increase then at some joint (chiefly the hip and knee) realignment osteotomy should be considered. It must be done while the joint is still stable and mobile and X-rays show that a major part of the joint space is preserved.

Pain relief is often dramatic and is ascribed to 1) Vascular decompression of the subchondral bone and 2) Redistribution of loading forces towards less damaged parts of the joint. After femoral astronomy, fibro cartilage may grow to cover exposed bone.

**14. Late :** Progressive joint destruction, with increasing pain, instability and deformity (particularly of one of the weight bearing joints), usually requires reconstructive surgery- Arthrodesis is indicated if the stiffness is acceptable and neighbouring joints are not likely to be prejudiced. With arthroplasty timing is essential. Too early, and the odds against a durable result lengthen in proportion to the demands of strenuous activity and time; to late, and bone destruction, deformity, stiffness and muscle atrophy make the operation more difficulty and the result more unpredictable. In neuropathic joint disease the underlying condition may need treatment but the affected joint cannot recover. They should be stabilized by external splint (eg. Caliper or brace) operation is seldom advised.

## **MANAGEMENT OF KNEE OSTEO ARTHRITIS:**

Active exercises concentrating on establishing full extension of the joint are important.

### **STRENGTHENING OF MUSCLES:**

Quadriceps muscles particularly vastus medialis, on which strengthening be concentrated. This can be achieved by using progressive resistance on land in water.

### **GAIT RE-EDUCATION:**

The gait should be analysed and corrected as required. Walking aids may be needed and the patient should be trained in their correct use. If both the knees are affected two sticks will be needed and the patient taught to use them as a normal four point gait pattern; if only one knee is affected then a single stick used in the opposite hand is sufficient.

Gait re-education includes management of stairs, slopes, standing to sitting and bed to chair transfers. Postural awareness needs to be stimulated and the patient encouraged assuming a more efficient posture.

In severe cases it may be necessary to provide some form of orthosis. If external splintage is used particular attention must be paid to the maintenance of the quadriceps muscle strength.

### **Other Useful Approaches in the management of Osteo Arthritis of Hip and Knee joints.**

Simple changes around the home and daily activities causes dramatic improvement in the symptomatology of osteo arthritis. The following are some of the measures.

1. Use of higher chair which require less effort to get in and get out should be considered.



2. Patients are advised to climb the stairs leading the good leg taking one stair leading with the bad leg, again taking one stair at a time.
3. To reduce the force acting across, the injured joint, the patient is advised to use a walking stick which acts as a third limb.
4. Foot wear with hard soles and high heels should be avoided.
5. Reduction in overweight helps to reduce the load on the joints.
6. General advice when standing.
  - ❖ Keep as upright as possible as this helps to put equal weight on both the legs.
  - ❖ Avoid sitting on a low or soft chair.
  - ❖ To avoid uneven and rough ground or surfaces while walking.

### **Exercises in the Management of OA of Hip and Knee.**

#### **Aims:**

- ❖ To increase the range of movements.
- ❖ To increase stability and shock absorption.
- ❖ To prevent deformity.
- ❖ To improve posture.
- ❖ To reduce pain and stiffness.

#### **Rules:**

- ❖ Build up the exercises gradually.
- ❖ Avoid rough ground while exercising.
- ❖ To take warm baths before starting the exercises.
- ❖ To perform the exercises 20 times, each twice a day and later four times a day.

### **Exercises Lying on the Back:**

- 1. Pelvic Tilt:** Tighten the thigh and buttock muscles, pushing the knees flat, hold for a count of five and then relax.
- 2. Pelvic Lift:** Bend both the knees up, push on the feet and lift, hold for a count of five and then relax.
- 3. Leg Stretch:** Push one leg along the floor as though you are trying to make it longer than the other hold for a count of five and then repeat with the other leg.
- 4. Alternate Leg Raising:** Keeping the knees straight, lift alternate legs six inches from the ground.

### **Exercises lying on your side, with the Painful Hip up:**

- 1. Side Leg Raising:** Keep the top leg straight and lift it up as high as possible, hold for a count of five and then relax.
- 2. Knee and Hip Flexion:** Bend the hip and knee of the top leg forwards, and hold for a count of five. Then straighten the leg and stretch backwards as far as it will go, hold for a count of five, then relax.

### **Exercises in Sitting Posture:**

- 1. Knee Together, Feet Apart:** Keep the knees together and move the feet apart, hold for a count of five then relax.
- 2. Feet Together, Knees Apart:** Keep the ankles together and move the knees apart, then relax.

### **Exercises in Standing Posture:**

- 1. Standing Leg Swing:** Hold onto a table or chair with one hand, swing one leg forward and backward. Try to get the backwards swing as wide as possible.
- 2. Standing Side Leg Swing:** Hold on to a chair with both hands. Swing the leg out as far as it will go and then in. The outward swing is the hardest part and the leg should be allowed to fall back under muscular control.

## **MATERIALS AND METHODS**

The study of Azhal Keel vayu was carried out during the year 2006 - 2009 at Post Graduate Department of Sirappu Maruthuvam, Government Siddha Medical College and Hospital, Palayamkottai.

The cases were selected from the Post-graduate out patient department (Sirappu-Maruthuvam) according to the signs and symptoms mentioned in the siddha literature.

### **Selection of the Cases:**

Certain criteria were followed for the selection of the patients for admission.

### **Selection Criteria:**

1. Affection of any one of the major joints with or without swelling.
2. Marked stiffness of the joint.
3. Restricted movements.
4. Crepitation present in the affected joints.

According to the above criteria **Fifty five Cases** were treated. Among them **Thirty Cases** were admitted for this study from both sexes of various age groups and **Twenty Five Cases** were treated as out patients. Priority for admission was given according to the clinical findings. The most of the signs and symptoms of Azhal Keel vayu correlated with the osteoarthritis in modern system of medicine. Conducting all necessary investigations in siddha as well as modern medicine were made to firm the diagnosis.

### **In siddha system the following aspects were taken into consideration.**

1. Mukkutra Nilaigal
2. Ennvagai thervugal
3. Udal Kattugalin Nilaigal

4. Neerkuri, Neikuri
5. Paruva Kaalangal
6. Thinaigal

The following investigations were done in Modern medicine aspect.

**HAEMATOLOGICAL INVESTIGATIONS:**

- |                                    |                       |
|------------------------------------|-----------------------|
| a) Total WBC count.                | e) Blood sugar.       |
| b) Differential WBC Count.         | f) Blood urea.        |
| c) Erythrocyte Sedimentation Rate. | g) Serum cholesterol. |
| d) Haemoglobin percentage.         |                       |

**URINE ANALYSIS:**

- a) Albumin.
- b) Sugar.
- c) Deposits.

**STOOLS EXAMINATIONS:**

- a) Ova.
- b) Cyst.
- c) Occult blood.

**SPECIAL INVESTIGATIONS:**

X-ray of the affected joint.

**Selection of the drugs:**

Selections of the drugs were made after the in-depth study of various siddha literatures.

**The test drugs:**

Nannariver Choornam (internal)

Sangan kuppi ver ennai (external)

**NANNARIVER CHOORNAM: 1gm three times a day with white sugar for internal use.**

**SANGAN KUPPI VER ENNAI:**

This oil was given only for external use on the affected joints.

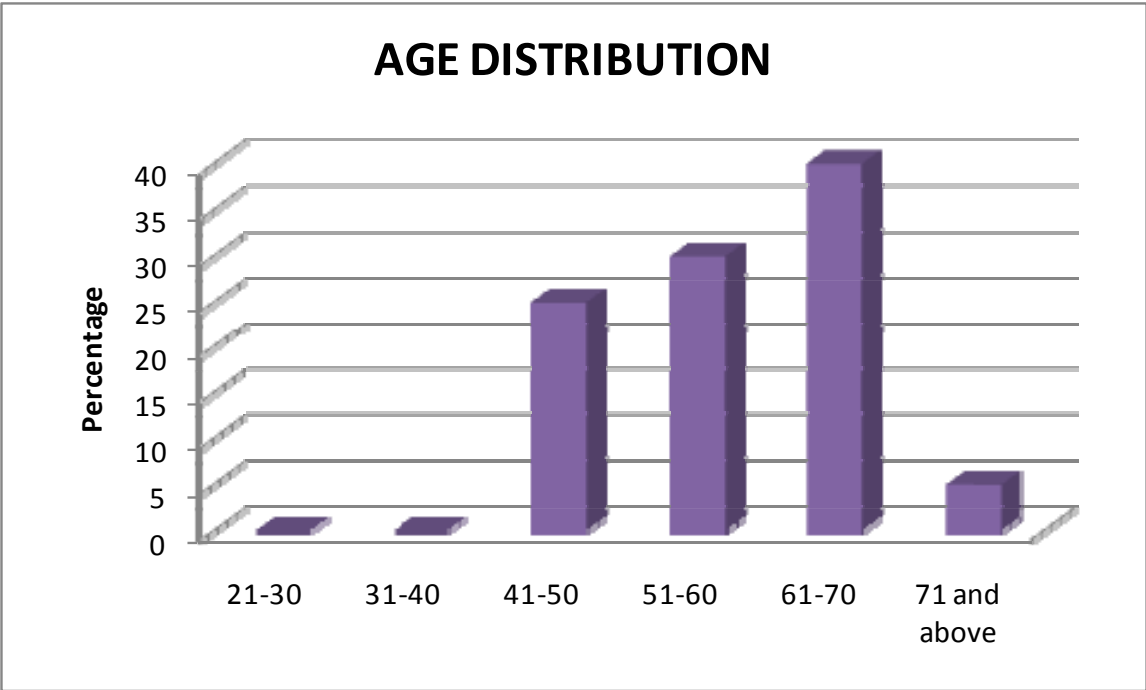
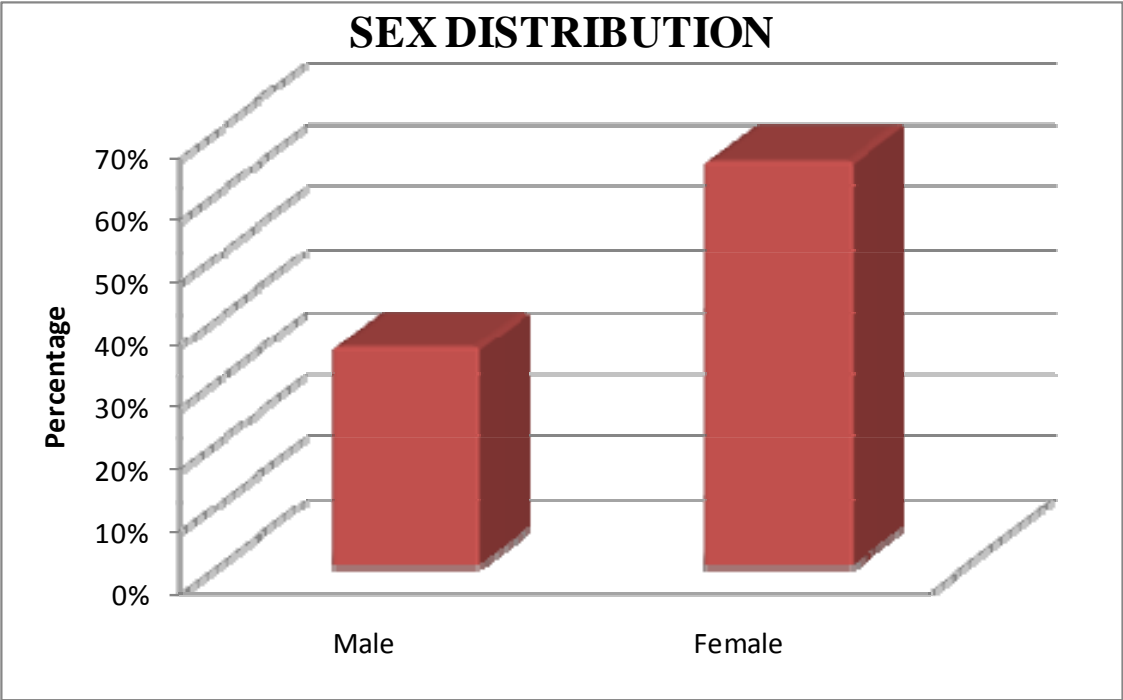
The day before the study started, Vellai Ennai – 15ml was given at early morning as a mild purgative to all the patients.

The drugs selected for the study were subjected to the Pharmacological and Bio-chemical analysis.

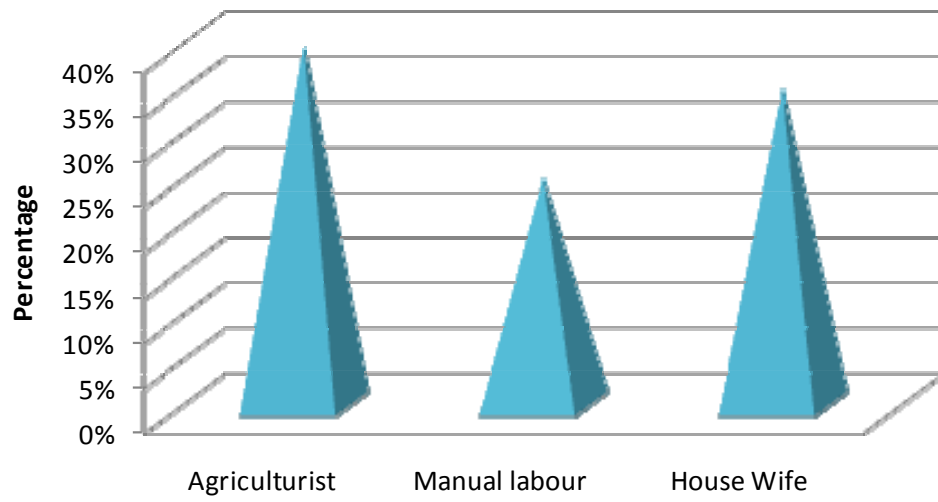
Pharmacological analysis was done at the Department of Pharmacology, and Bio-chemical analysis was done at the Department of Biochemistry, Govt. Siddha Medical College, Palayamkottai.

All the patients admitted for the study were given uniformly regular hospital diet.

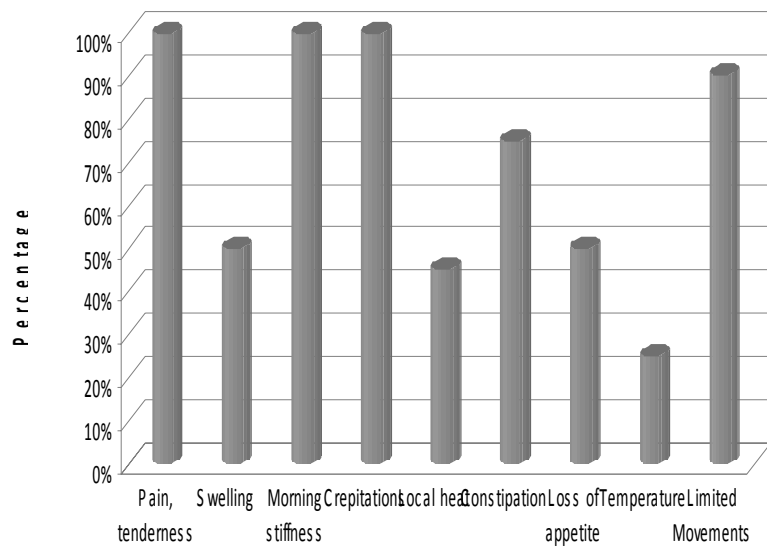
During discharge all the patients were advised to attend the out patient Department of Sirappu Maruthuvam, Post-Graduate Govt. Siddha Medical College Hospital, Palayamkottai for the further follow-up.



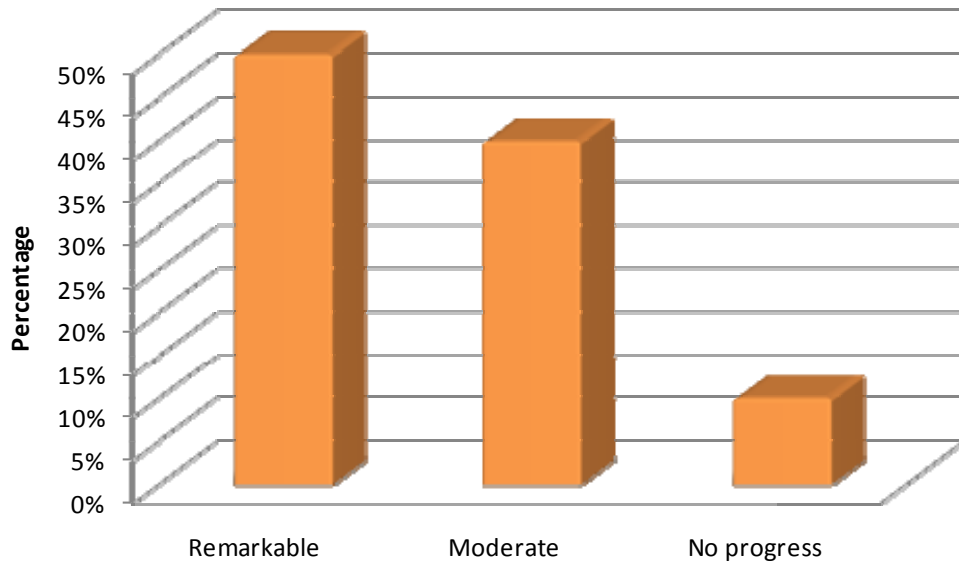
## OCCUPATIONAL STATUS



## CLINICAL FEATURES



## RESULTS





## RESULTS AND OBSERAVATIONS

Results were observed with respect to the following criteria:

1. Sex distribution
2. Age distribution
3. Kaalam
4. Paruva Kaalam
5. Thinai
6. Duration of the illness
7. Socio-economic status
8. Occupational status
9. Diet references
10. Precipitating factors
11. Prevalent sites
12. Clinical features
13. Mode of onset
14. Thridosa theory
15. Udal Kattugal
16. Ennvagai thervugal
17. Nei Kuri
18. Yakkai Ellakkanam
19. Gunam reference
20. Result

### 1. SEX DISTRIBUTION:

S. No.	Sex	No. of Cases	Percentage
1.	Male	7	35%
2.	Female	13	65%

Among 20 cases, 7 were males and 13 were females.

## 2. AGE DISTRIBUTION:

S. No.	Age	No. of Cases	Percentage
1.	21-30	-	-
2.	31-40	-	-
3.	41-50	5	25%
4.	51-60	6	30%
5.	61-70	8	40%
6.	71 and above	1	5%

Most of the cases were above the age group of 60. No one was reported below the age group of 40 during the study.

## 3. KAALAM:

S. No.	Kaalam	No. of Cases	Percentage
1.	Vatham (0-33yrs)	-	-
2.	Pitham (34-66yrs)	17	85%
3.	Kapham (67-100yrs)	3	15%

Most of the cases 85% were in Pitha Kaalam and the rest were reported in Kapha Kaalam.

No cases were reported in Vatha Kaalam.

#### 4. PARUVA KAALAM:

S. No.	Paruvakaalam	No. of Cases	Percentage
1.	Kaar (Aavani, Purattasi) (Aug16-Oct15)	5	25%
2.	Koothir (Iypasi, Karthigai) (Oct16-Dec15)	2	10%
3.	Munpani (Margali, Thai) (Dec16-Feb15)	-	-
4.	Pinpani (Masi, Pankuni) (Feb16-Apr15)	-	-
5.	Elavenil (Chithirai, Vaikasi) (Apr16-June15)	8	40%
6.	Muthuvenil (Aani, Aadi) (June16-Aug15)	5	25%

The maximum incidence of Azhal Keelvayu was during the Elavenil Kaalam. No cases were reported in Munpani and Pinpani Kaalam.

#### 5. THINAI (PLACE):

S. No.	Thinai	No. of Cases	Percentage
1.	Kurinji (Hill area)	-	-
2.	Mullai (Forest area)	-	-
3.	Marutham (Fertile area)	20	100%
4.	Neithal (Coastal area)	-	-
5.	Paalai (Desert area)	-	-

Among the 20 cases, all the cases were belonged to Marutha nilam. It does not correlate with siddha literature.

#### 6. DURATION OF THE DISEASE SUFFERINGS:

S. No.	Duration (Months)	No. of Cases	Percentage
1.	0-3	6	30%
2.	3-6	4	20%
3.	6-12	3	15%
4.	12-24	4	20%
5.	24-36	2	10%
6.	36 and above	1	5%

Among the 20 cases, most of them had the duration of the illness 3 months and above.

## 7. THE SOCIO-ECONOMIC STATUS:

S. No.	Socio-economic status	No. of Cases	Percentage
1.	Poor	14	70%
2.	Middle class	6	30%
3.	Rich	-	-

According to this study 70% of the cases were poor socio-economic status, 30% cases were from middle class families.

## 8. OCCUPATIONAL STATUS:

S. No.	Nature of Work	No. of Cases	Percentage
1.	Agriculturist	8	40%
2.	Manual labour	5	25%
3.	House Wife	7	35%

Occupational status shows agriculturists and house wife's were more affected.

## 9. DIET REFERENCE:

S. No.	Diet Habit	No. of Cases	Percentage
1.	Vegetarian	6	30%
2.	Mixed diet	14	70%

30% cases were Vegetarian diet, 70% cases were mixed diet.

**10. TABLE SHOWING PRECIPITATING FACTORS:**

<b>S. No.</b>	<b>Precipitating Factors</b>	<b>No. of Cases</b>	<b>Percentage</b>
1.	Exposure to cold	3	15%
2.	Over use of the joint	11	55%
3.	Over Weight	5	25%
4.	Trauma	1	5%

Among the 20 patients 3 (15%) of them showed exposure to cold as a precipitating factor and 11 of them (55%) had the history of over use of the joint. 5 of them (25%) were over weight and 1 of them (5%) were Trauma.

**11. TABLE SHOWING PREVALENCE OF THE JOINT AFFECTION:**

<b>S. No.</b>	<b>Affected joint</b>	<b>No. of Cases</b>	<b>Percentage</b>
1.	Knee (Both)	20	100%
2.	Ankle (Both)	-	-
3.	Shoulder	1	5%
4.	Hip	1	5%

Among the 20 patients in the In-patients ward all the 20 cases (100%) had affection of the Knee joints. Shoulder and Hip each one case (5%) had affected.

## 12. TABLE SHOWING CLINICAL FEATURES:

<b>S. No.</b>	<b>Signs and Symptoms</b>	<b>No. of Cases</b>	<b>Percentage</b>
1.	Pain, tenderness	20	100%
2.	Swelling	10	50%
3.	Morning stiffness	20	100%
4.	Crepitations	20	100%
5.	Local heat	9	45%
6.	Constipation	15	75%
7.	Loss of appetite	10	50%
8.	Temperature	5	25%
9.	Limited Movements	18	90%

Among the twenty cases all of them had pain, tenderness, morning stiffness and crepitation. 75% of the patients had constipation and highly painful limited movements.

### Measurement of swelling at joint line (Knee) in cm

S.No	Patient Name	Age/Sex	IP No	Before Treatment		After Treatment	
				Right	Left	Right	Left
1	Dhasan	55/M	1072	35	33	32	31
2	Pappammal	45/F	1240	41	41	40	40
3	Peatchiammal	63/F	1287	37	35	37	35
4	Thenammal	55/F	1297	33	33	32	32
5	Shanmugam	64/M	1313	36	36	34	35
6	Rathinam	60/F	1401	32	30	31	30
7	Sumathi	65/F	1581	45	43	43	42
8	Isakhi	70/M	2025	35	34	34	33
9	Pappathi	72/F	2751	34	32	33	31
10	Kaliammal	42/F	2803	36	33	33	33

### Radiological Findings:

S. No.	Findings	NO of Cases	Percentage
1	Joint Space narrowing	20	100%
2	Inter condylar notch prominence	9	45%
3	Osteophytes	16	80%
4	Subchondral Sclerosis	14	70%
5	Osteoporosis	15	75%
6	Deformity	4	20%

Joint Space narrowed in all cases (100%), Osteophytes present in 16 cases (80%), Osteoporosis present in 15 cases (75%), deformity present in 4 cases (20%), Subchondral sclerosis present in 14 cases (70%). Intercondylar notch prominence present in 9 cases (45%).



**b) Tenderness at joint line (Knee)**

<b>S.No</b>	<b>Patient Name</b>	<b>Age / Sex</b>	<b>IP.No</b>	<b>Before Treatment in Grades</b>	<b>After Treatment in Grades</b>
1	Dhasan	55/M	1072	II	Nil
2	Muppidathi	50/M	1230	I	Nil
3	Pappammal	45/F	1240	II	Nil
4	Petchiammal	63/F	1287	III	II
5	Thenammal	55/F	1297	I	Nil
6	Shanmugam	64/M	1313	II	II
7	Padmavathi	56/F	1323	I	Nil
8	Rathinam	60/F	1401	II	I
9	Sumathi	65/F	1581	II	II
10	Esakhiyammal	63/F	1596	II	I
11	Muthammal	60/F	1600	II	Nil
12	Chidampparathammal	55/F	1601	I	Nil
13	Vanitha	50/F	1632	II	I
14	Esakhi	70/M	2025	III	II
15	Saroja	45/F	2205	I	Nil
16	Iyappan	55/M	2231	I	Nil
17.	Latheep	65/M	2276	III	II
18.	Subbiah	70/M	2290	III	II
19.	Pappathi	72/F	2751	III	II
20.	Kalliyammal	42/F	2803	I	Nil

**Assessment of joint tenderness**

Grade I : The patient says the joint is tender

Grade II : The patient winces

Grade III : The patient winces and withdraws the affected part

Grade IV : The patient will not allow the joint to be touched.

### Body Mass Index of in Patients

$$\text{BMI} = \text{Weight in kg}/(\text{Height in meters})^2$$

S.NO	Name	IP NO	Age	Sex	Wt in kg	Ht in m	BMI
1	Dhasan	1072	55	M	55	1.6	20.6
2	Muppidathi	1230	50	M	65	1.72	23.2
3	Pappammal	1240	45	F	69	1.6	26.9
4	Petchiammal	1287	63	F	58	1.51	24.1
5	Thenammal	1297	55	F	53	1.55	22
6	Shanmugam	1313	64	M	66	1.7	25.2
7	Padmavathi	1323	56	F	61	1.56	26.7
8	Rathinam	1401	60	F	65	1.5	26.7
9	Sumathi	1581	65	F	62	1.49	26.9
10	Eshakiammal	1596	63	F	51	1.5	22.6
11	Muthammal	1600	60	F	56	1.52	24.8
12	Chidampparathammal	1601	55	F	52	1.6	21.6
13	Vanitha	1632	50	F	68	1.58	27.3
14	Eshaki	2025	70	M	62	1.66	22.5
15	Saroja	2205	45	F	52	1.52	22.6
16	Iyyappan	2231	55	M	57	1.64	21
17	Latheep	2276	65	M	68	1.75	22.1
18	Subbiah	2290	70	M	60	1.64	2.3
19	Pappathi	2751	72	F	52	1.58	21.6
20	Kaliammal	2803	42	F	53	1.55	22.4
<b>Normal BMI - In Males 20 to 24.9</b>							
<b>- In Females 18 to 24.9</b>							
<b>Overweight - 25 to 29.9</b>							
<b>Obesity - More than 30.</b>							

### 13. ONSET OF DISEASE:

S. No.	Mode of onset	No. of Cases	Percentage
1.	Sudden	-	-
2.	Gradual	20	100%

According to this study 100% of cases were reported gradual onset of disease.

### 14. DISTRIBUTION OF THRIDOSA:

#### a. Table showing the derangement of vatham:

S. No.	Vatham	No. of Cases	Percentage
1.	Pranan	-	-
2.	Abanan	15	75%
3.	Viyanan	20	100%
4.	Uthanan	-	-
5.	Samanan	20	100%
6.	Naagan	-	-
7.	Koorman	5	25%
8.	Kirukaran	-	-
9.	Devathathan	10	50%
10.	Dhananjeyan	-	-

Both Viyanan and Samanan were affected in all the twenty cases (100%).

Abanan was affected in 15 cases (75%).

Devathathan was affected in 10 cases (50%).

Koorman was affected in 5 cases (25%).

**b. Table showing the derangement of Pitham:**

<b>S. No.</b>	<b>Pitham</b>	<b>No. of Cases</b>	<b>Percentage</b>
1.	Analapitham	10	50%
2.	Ranjagam	7	35%
3.	Saathagam	20	100%
4.	Prasagam	-	-
5.	Alosagam	-	-

Saathagam was affected in 20 cases (100%)

Analapitham was affected in 10 cases (50%).

Ranjagam was affected in 7 cases (35%).

**c. Table Showing the Derangement of Kapham:**

<b>S. No.</b>	<b>Kapham</b>	<b>No. of Cases</b>	<b>Percentage</b>
1.	Avalambagam	20	100%
2.	Kilethagam	10	50%
3.	Pothagam	-	-
4.	Tharpagam	-	-
5.	Santhigam	20	100%

In all the 20 cases (100%) Avalambagam and Santhigam were affected.

Kilethagam was affected in 10cases (50%).

**15. TABLE SHOWING THE CONDITION OF UDAL KATTUGAL:**

<b>S. No.</b>	<b>Udal Kattugal</b>	<b>No. of Cases</b>	<b>Percentage</b>
1.	Saaram	20	100%
2.	Senneer	7	35%
3.	Oon	5	25%
4.	Kozhuppu	-	-
5.	Enbu	20	100%
6.	Moolai	-	-
7.	Venneer/Suronitham	-	-

In all the cases Saaram and Enbu were affected (100%).

Senneer was affected in 7 cases (35%).

Oon was affected in 5 cases (25%).

**16. ENNVAGAI THERVUGAL:**

<b>S. No.</b>	<b>Ennvagai thervugal</b>	<b>No. of Cases</b>	<b>Percentage</b>
1.	Naadi	20	100%
2.	Sparisam	20	100%
3.	Naa	12	60%
4.	Niram	-	-
5.	Mozhi	-	-
6.	Vizhi	5	25%
7.	Malam	15	75%
8.	Moothiram	3	15%

Naadi was affected in all the cases, 12 cases (60%) were Pitha vatha Naadi, 4 cases (20%) were Vathapitha naadi, 4 cases (20%) were vatha naadi. Sparisam was affected in 20 cases (100%).

Naa was affected in 12 cases (60%), Vizhi was affected in 5 cases (25%). Malam was affected in 15 cases (75%) and Moothiram was affected in 3 cases (15%).

### 17. NEIKURI:

Among the 20 cases, the Neikuri result was observed as follows:

S. No.	Neikuri	No. of Cases	Percentage
1.	Spreading like a snake	4	20%
2.	Spreading like a ring	6	30%
3.	Spreading like a pearl	-	-
4.	Combined of ring and snake	10	50%

### 18. YAKKAI ELLAKKANAM (PHYSICAL CONSTITUTION):

S. No.	Yakkai Ellakkanam	No. of Cases	Percentage
1.	Vatha udal	4	20%
2.	Pitha udal	3	15%
3.	Kapha udal	1	5%
4.	Thontha udal	12	60%

Among the 20 cases, the majority were of Thontha udal.

### 19. GUNAM (QUALITY AND CHARACTERS):

S. No.	Gunam	No. of Cases	Percentage
1.	Sathuva Gunam	-	-
2.	Rajo Gunam	6	30%
3.	Thamo Gunam	14	70%

Most of the cases had Thamo gunam.

## **20. RESULTS:**

### **ASSESSMENT OF EFFECT OF THERAPY**

#### **Remarkable Effect**

No longer any clinical manifestations.

Patient could work and live normally

No recurrence after some months.

#### **Moderate Effect**

Marked reduction of manifestations.

Slight pain after movement

#### **Poor Effect**

Slight reduction in the clinical manifestation

With relapse

<b>Effect of therapy</b>	<b>No. of cases</b>	<b>Percentage</b>
Remarkable	10	50%
Moderate	8	40%
No progress	2	10%

#### **Observation:**

70% of the cases showed good prognosis clinically. The results were based on the clinical improvements, the author had tried not only medicines but also recommended yoga therapy.

## DISCUSSION

Azhal Keel vayu is one of the major bony joint problems i.e. really the movable joints affected which makes the elder people most troublesome especially. The disease Azhal Keel vayu as explained in Siddha system of medicine has got close resemblance with that of osteoarthritis of modern system of medicines in conservation as well as clinical importance.

The drugs used to treat this disease were **Nannariver Choornam internally and Sangan kuppi ver ennai externally**. This study is a trial to throw light the role of the drugs in all aspects in the management of the disease.

**Thirty cases** of Azhal Keel vayu were admitted in the In-patient ward who was diagnosed clinically on the basis of signs and symptoms described in the text “Siddha Maruthuvam”. The clinical diagnosis was made confirmed by means of other siddha aspects of examinations. Out of twenty five cases, in the out-patient ward, twenty were selected for this study.

### **Sex Distribution:**

Among the twenty cases, 7 (35%) were male and 13(65%) were female patients. It shows that females are more affected than males.

### **Age Distribution:**

According to this study most of the patients were above the age of 50. Only 4 (20%) were reported in between the age group of 40 to 50.

No one was reported below the age of 40 during the study.

This confirms the degenerative process of this disease.

### **Prevalence of Affecting the Joints:**

In Azhal Keelvayu the hallmark is involvements of articular joints. The involvement of the ailment was mostly found out in the knee joints.



**Duration of the Illness:**

According to this study the duration of the illness varied from 3 months to 3 years. Naturally, this disease is a chronic one unless any history of trauma. Because, this disease as already told, a slow, progressive disorder most probably encouraging degenerative condition.

**Socio-economic Status:**

Among the 20 cases were selected for this study, 14 cases (70%) were poor class and only 6 cases (30%) were middle class family.

**Diet Reference:**

According to this study 14 cases (70%) had mixed diet habits.

**Occupation Status:**

According to this study, the 8 cases (40%) were agriculturists.

**Precipitating Factors:**

According to this study exposure to cold, excessive use of the knee joint and obesity were played major roles.

**Clinical Manifestation:**

Among the twenty cases, all of them had pain, tenderness, morning stiffness, crepitation etc, most of them were reported with mild swelling, slightly restricted movements, loss of appetite and habitual constipation.

**Paruva Kaalam:**

In the disease of keel vayu, being a vadha disease according to many siddha literatures, vadham gets vitiated in munpani kaalam. Here the higher incidence of the disease was in the same above mentioned Elavenil Kalam (8 cases) next to that is Muthuvenil Kalam (5 cases), Kaar Kalam (5 cases), Koothir Kalam (2 cases) and there is no cases in Munpani and Pinpani Kalam.

**Thinai:**

In this study it was observed that all of the cases were from Marutha Nilam.

**Disturbance in Vatham:**

In the twenty cases, in all of them (100%) Viyanan and Samanan were affected. Abanan was affected in 15 (75%) cases. Devathathan was affected in 10 cases (50%). Koorman was affected in 6 cases (30%).

**Disturbance in Pitham:**

Saathaga Pitham was affected in all cases. Ranjaga Pitha was affected in 35% cases. Anal Pitham was affected in 50% cases.

**Disturbance in Kapham:**

According to this study Avalambagam and Santhiga Kapham was affected in all the cases (100%). Kilethagam was affected in 10 (50%) cases.

**Udal Kattugal:**

Among the Seven Udal Kattugal, Saaram and Enbu were affected in all cases. Senneer was affected in 7 (35%). Oon was affected in 5 cases (25%).

**Gunam:**

According to this study, 14 cases (70%) had Thamo gunam and 6 cases had Rajo gunam.

**Yakkai Ellakkanam:**

Among the 20 cases, majority 60% of them had Thontha Udal, 20% of them had vatha Udal, 15% of them had Pitha Udal and 5% of them had Kabha Udal.

**Ennvagai thervugal:**

According to this study, in Ennvagai thervugal, Naadi was affected in all the cases (100%), Naa was affected in 12 cases (60%). Sparism was affected in 20 cases (100%). Vizhi was affected in 6 cases (30%). Malam was affected in 15 cases (75%) and Moothiram was affected in 3 cases (15%).

**Neikuri:**

Among the 20 cases, 75% of the cases showed Vatha pitha neer. Remaining 25% showed Pitha vadha kalappu neer.

**Laboratory Investigation:**

The available laboratory investigations were done in the Govt. Siddha Medical College, Palayamkottai. Routine examination of blood, urine and stools were done during the admission and discharge. Examination of urine and stools showed no abnormalities. In the blood 7 (35%) of the cases had decreased Hb%, Blood sugar, Blood urea, Serum cholesterol were also done in Bio-chemistry department, Government Siddha Medical College, Palayamkottai. All the shown values have been recorded in the Investigation table. In all the cases X-rays showed osteophytic changes and marginal erosion.

**Results:**

Among the 20 cases, 10 cases (50%) showed good relief, 8 cases (40%) showed moderate relief. And 2 cases (10%) showed No progress only. The results were based on the clinical improvements.

## SUMMARY

1. **Fifty Five cases** of Azhal Keelvayu, diagnosed clinically. Out of them **Thirty Cases** were admitted in the in-patient PG Sirappu Maruthuvam Ward, Govt. Siddha Medical College Hospital, Palayamkottai were observed for clinical diagnosis, lab diagnosis and treatment by the trial medicines. Out of them **Twenty Cases** were selected for study. **Twenty Five Cases** were treated as out patients.
2. Clinical diagnosis of Azhal Keel vayu was done on the basis of clinical features described in the siddha text books.
3. Laboratory diagnosis of Azhal Keelvayu was done by modern methods of examination in the Govt. Siddha Medical College Hospital, Palayamkottai.
4. The various siddha aspects of examination of the disease were carried out and recorded in a proforma.
5. The trial medicines choosed for both internal and external treatment and the management of Azhal Keelavayu
  - ❖ Nannariver Choornam as per the severity of the complaints, the dosage was given 1 gm three times a day with white sugar for fifteen days and above.
  - ❖ Sangan kuppi ver ennai (Externally).
6. Before starting the treatment, careful detailed history was carried out and recorded from the twenty selected patients.
7. During the period of treatment, all the patients were put under strict pathiyam-a specific dietary regimen.

8. The observation made during the clinical study shows that the main drug **Nannariver Choornam (Internally)** is clinically effective. It has moderate analgesic action and significant anti inflammatory action.
9. The action of **Sangan kuppi ver ennai (Externally)** over the affected joint was also clinically effective. It has Significant anti inflammatory action.
10. A periodical laboratory investigation were made for all the case for blood, urine and motion test etc., along with radiological reports.
11. Since Azhal Keel vayu is a chronic disease, it required minimum treatment for twenty days, treated both internally and externally to minimize the severe pain, tenderness and Swelling, but also slight disappearance of the crepitation.

## CONCLUSION

All the twenty patients, selected for this Study were treated with **Nannariver Choornam** (Internal 1gm tds with white sugar) and **Sangan kuppi ver ennai** (Externally).

Clinical results show improvement in large number of the cases that is 50%. During the meantime of treatment, under admission all the Azhal Keel vayu patients were instructed and guided to follow the following asanas.

- a) Komugaasana - The Cow head Posture
- b) Padmasana - The Lotus Posture
- c) Vajraasana - The Adamant posture

It was sure that no one had any remission up to 6 months.

If any further recurrence or no satisfied improvement, the individuals were instructed to follow up treatment both internally and externally. It is very pleasurable to say here, the author highlights the trial medicines are found effective just relieved from pain and tenderness, severe morning stiffness, severe crepitation, arresting of marked swelling and so on.

It was noted that the internal drug **Nannariver Choornam** was free from adverse side effects, i.e. no cases were reported either nausea or vomiting and the external application **Sangan kuppi ver ennai** was not irritant, i.e. no cases were reported itching or inflammation or eruption wherever massaged. Meanwhile it gave good soothing effect to the affected part.

**ANNEXURE-I**  
**DRUG REVIEW**  
**PREPARATION OF TRIAL DRUG**

**நன்னாரி வேர் சூரணம் (Internal Medicine)**

ஆதாரம்: கோஷாயி - அனுபோக வைத்திய பிரம்ம ரகசியம் பக்கம்:142

**சரக்கு:**

நன்னாரி வேர்

**செய்முறை:**

சரக்கை சுத்தித்து நிழலில் உலர்த்தித் தூள் செய்து சலித்து எடுத்துக் கொள்ள வேண்டும்.

அளவு : 1 - 2 கிராம் மூன்று வேளை  
அனுபானம் : சம அளவு வெள்ளை சர்க்கரை  
தீரும் நோய் : கீல்பிடிப்பு தீரும்

**சங்கன் குப்பி வேர் எண்ணெய் (External Medicine)**

ஆதாரம் : பதார்த்த குண விளக்கம் - மூலவர்க்கம் பக்கம்:300  
சரக்குகள் : சங்கன் குப்பி வேர்  
நல்லெண்ணெய்

**செய்முறை:**

இதன் வேரைத் தட்டி நல்லெண்ணெயில் போட்டுக் காய்ச்சிக் கீல்களின் பிடிப்புக்குத் தேய்க்கக் குணமாகும்.

## PROPERTIES OF THE HERBAL DRUGS

### Internal Medicine:

#### 1. நன்னாரி:

Botanical Name : Hemidesmus indicus

Family : Asclepiadaceae

#### Synonyms:

அங்காரிமூலி, நறுநெட்டி, பாதாளமூலி, கோபாகு, சாரிபம், பாற்கொடி, நறுண்டி, கானனுசாரி, கிருஷ்ணவல்லி, சாரியம்.

#### Part Used:

Dried Root

#### Organoleptic Characters:

Suvai : Inippu, siru kaippu

Thanmai : Thatpam

Pirivu : Inippu

#### Chemical Constituents:

Plant contains coumarino - lignoid hemidesmine, hemidesine, emidine.

Roots contain hexatria contanes, lupeol,  $\alpha$ -amyirin,  $\beta$  -amyirin, sitosterol, coumarino - lignoids, hemidesmin - 1 and hemidesmin -2.

Air dried roots yield essential oil containing p-metholy salicylic aldehyde as the major constituent, also contain  $\beta$  – sitosterol,  $\alpha$  and  $\beta$  amyirins, lupeold, tetracyclic triter pene alcohols, resin acids, fatty acids tannins, saponins, a glucoside and a ketone.

Recent researchers by allopathy have proved conclusively that the active principles of sarasaparilla consist of an enzyme, an essential oil and a saponin.

#### Botanical Aspect:

Twining or prostrate or semi-erect laticiferous herbs. Leaves linear - lanceolate, often with white streales above. Flowers yellow to brownish in cymes. Follicle slender, divaricated.



**Therapeutic Actions:**

Alterative	-	உடற்றேற்றி
Tonic	-	உரமாக்கி
Demulcent	-	உள்ளழலாற்றி
Diuretic	-	சிறுநீர்ப் பெருக்கி
Diaphoretic	-	வியர்வை பெருக்கி

**Therapeutic Effects:**

Diseases of Pitham and Vatham, Rheumatism.

**Uses:**

“சலதோடம் பித்தமதி தாகம் உழலை  
சலமேறு சீதமின்னாந் தஞ்சு - டுலகமதிற  
சென்மது மேகம் புண் கரமிவையெ லாமொழிக்கும்  
மென்மதுர நன்னாநி வேந்”

- பதார்த்த குணவிளக்கம்

**Vernacular Names:**

Eng	:	Indian Sarasaparilla, country sarasaparilla
Tel	:	Sugandhi
Sans	:	Sariba
Mal	:	Nannari
Hind	:	Magrabu
Kan	:	Sugandha – Palade
Duk	:	Nat-ka-ushak

## 2. சங்கன் குப்பி:

Botanical Name : Clerodendrum inerme

Family : Verbenaceae

### Synonyms:

குண்டலி, கோல், சங்கங்குப்பி, முத்தாபலம், மீச்செங்கன், பீனாசெங்கம் குப்பி.

### Vernacular Names:

Eng : Smooth volkameria

Tel : Pishinika, utti-chetta, Pisangi

Mal : Shangam – kuppi

San : Kundal

Hind : Sang – kuppi sang kupi

Dek : Isamdhari

### Part used:

Root

### Organoleptic characters:

Suvai : Kaippu

Veeriyam : Veppam

Pirivu : Kaarppu

### Chemical Constituents:

Plant contains clerodane diterpene – clerodermic acid, friedelin, methoxy flavone, salvigenin, acacetin, and apigenin.

### Botanical aspects:

Straggling shrubs which obovate glandular leaves. Flowers white in axillary cymes. Drupe brown.

It is called “Garden Quinine” an account of its intense bitter taste.

**Therapeutic Actions:**

Alterative	:	உடற்றேற்றி
Fegrifuge	:	வெப்பகற்றி
Tonic	:	உரமாக்கி

**Therapeutic effects:**

Diseases of vatham, rheumatism.

**Uses:**

“வெட்டை சொறி சிரங்கு களுங்குட்ட ரோகம்  
உரப்பான மேகம் ஒழியுங் - கருவாழ்  
கருங்கிரந்தி செவ்வாப்புக் கட்டிகளு மேகும்  
அருஞ்சங்கங் குப்பிக் கறி”

- பதார்த்த குண விளக்கம்

**3. SESAMUM INDICUM: (எள்)**

Family - Pedaliaceae

**Other Language Names:**

English	-	Gingelly seed
Hindi	-	Til
Tamil	-	Ellu
Telungu	-	Nuvvulu
Malayalam	-	Karuellu

**Tamil Synonyms:****Habitat:**

This small bush is indigenous to India and extensively cultivated in the warmer regions.

**Parts used:**

Seeds and fixed oil which expressed from the seeds.

**Constituents:**

Seeds contain fixed oil 50-60% proteins 22%, carbohydrates 18%, mucilage 4% woody fibre 4% and ash 4.8%.

Oil contains 70% of liquid fats consisting of the glycerides of oleic and linoleic acids and 12-14% of solid fats, stearin, palmitin and myristin, a crystalline substance sesamin and a phenol compound seasmol.

**Therapeutic action:**

- ❖ Laxative
- ❖ Emollient
- ❖ Demulcent
- ❖ Diuretic
- ❖ Lactagogue
- ❖ Emmenagogue

**எள் நெய்யின் பொதுக்குணம்:**

“புத்தி நயனக்குளிர்ச்சி பூரிப்பு மெய்ப்புகைஞ்  
சத்துவங் கந்தி தனியிளமை - மெத்தவுண்டாக்  
கண்ணோய் செவிநோய் கபாலவழல் காசநோய்  
புண்ணோய் பேர மெண்ணெய்யகற் பேரற்று”

- அகத்தியர் குணபாடம்.

## ANNEXURE II

GOVT SIDDHA MEDICAL COLLEGE, PALAYAMKOTTAI

### BIO-CHEMICAL ANALYSIS OF

### NANNARI VER CHOORNAM

#### Preparation of the extract:

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

#### Qualitative analysis:

S. No.	Experiment	Observation	Inference
1.	<b><u>TEST FOR CALCIUM</u></b> 2ml of the above prepared extract is taken in a clean test tube. Add 2 ml of 4% ammonium oxalate solution is added to it	A white precipitate is formed	Indicates the presence of calcium.
2.	<b><u>TEST FOR SULPHATE</u></b> 2ml of the extract is added to 5% barium chloride solution	No white precipitate is formed	Absence of Sulphate
3.	<b><u>TEST FOR CHLORIDE</u></b> The extract is treated with silver nitrate solution	No white precipitate is formed	Indicates the presence of Chloride.
4.	<b><u>TEST FOR CARBONATE</u></b> The substance is treated with concentrated HCL.	No brisk effervescence is formed	Absence of Carbonate

5.	<b><u>TEST FOR STARCH</u></b> The extract is added with weak iodine solution	Blue colour is formed	Indicates the presence of starch.
6.	<b><u>TEST FOR IRON FERRIC</u></b> The extract is treated with glacial acetic acid and potassium ferro cyanide.	No Blue color is formed	Absence of ferric Iron
7.	<b><u>TEST OF IRON FERROUS</u></b> The extract is treated with concentrated nitric acid and ammonium thio cyanate	Blood red colour is formed	Indicates the presence of ferrous iron.
8.	<b><u>TEST FOR PHOSPHATE</u></b> The extract is treated with ammonium Molybdate and concentrated nitric acid.	No yellow precipitate is formed	Absence of phosphate
9.	<b><u>TEST FOR ALBUMIN</u></b> The extract is treated with Esbach's reagent.	No yellow precipitate is formed	Absence of Albumin.
10.	<b><u>TEST FOR TANNIC ACID</u></b> The extract is treated with Ferric Chloride reagent.	Blue black precipitate is formed.	Indicates the presence of Tannic acid.
11.	<b><u>TEST FOR UNSATURATION</u></b> Potassium permanganate solution is added to the extract.	It gets decolourised.	Indicates the presence of unsaturated compound.

12.	<p><b><u>TEST FOR THE REDUCING SUGAR</u></b></p> <p>5ml of Benedict's qualitative solution is taken in a test tube and allowed to boil for 2 mts and added 8-10 drops of the extract and again boil it for 2 mts.</p>	Colour change occurs.	Indicates the presence of Reducing Sugar.
13.	<p><b><u>TEST FOR AMINO ACID</u></b></p> <p>One or two drops of the extract is placed on a filter paper and dried it well, after drying 1% Ninhydrin is sprayed over the same and dried it well.</p>	Violet colour is formed.	Indicates the presence of Amino acid.

**Inference:**

The trial drug **NANNARI VER CHOORNAM** contains Calcium, Chloride, Starch, Ferrous Iron, Tannic Acid, Unsaturated Compounds, Reducing Sugar, Amino acid.

## ANNEXURE III

### PHARMACOLOGICAL ANALYSIS

#### ANALGESIC STUDY OF NANNARI VER CHOORANAM

**Aim:**

To study the effects of analgesic action on albino rats by tail flick method.

**Instruments:**

Analgesiometer using heated nicrome wire as the source of stimulus.

**Procedure:**

Two groups of rats on either sex were selected, each group having three rats and each rat was put inside a rat holder with the tail projecting out fully. The tip of the tail was kept over the nicrome wire of the analgesiometer. To heat the nicrome wire by switching it on and at the same time starting a stopwatch. The time takes for the rat to flick the tail was noted. This was kept as the control volume.

Paracetamol was administered at a dose of 20mg/100gm of body weight orally to the test group. The reaction time was noted after the administration half an hour and one hour and the average is calculated.

When a rat fails to flick the tail, it should be continued beyond eight seconds to avoid injury.

The result of drug treated group and control group were tabulated and compared.



Group	Dose/100mg Body weight	Initial reading (in Sec )	After Drug Administration			Mean Difference
			½ hr. Average	1 hr. Average	1 ½ hr. Average	
Control	Water 2ml	2.5	2.5	2.5	2.5	2.5
Standard	Paracetamol- 20mg	2.5	3.5	5.0	6.5	6.5
Test drug	100mg	2.0	2.5	3.5	4.7	4.7

**Inference:**

The test drug seems to have **significant analgesic action**.

## **ACUTE ANTI-INFLAMMATORY ACTIVITY IN RATS BY HIND-PAW METHOD**

To demonstrate the acute anti-inflammatory activity of NANNARI VER CHOORANAM in albino rats by Hind-paw method.

### **Procedure:**

Nine Albino rats weighing 100-150gm were taken and divided into three groups and each group consisting three rats.

First group was kept as control and received water. Second group received Ibuprofen at a dose of 20mg/100gm-body weight. Third group animals received keelvathathuku chooranam suspension at a dose of 100mg/100gm-body weight.

Before administration of drugs, the Hind-paw volume of all the rats was measured. This was done by dipping the Hind-paw upto the tibio-tarsal junction in mercury plethysmograph. Soon after the measurement the drugs were administered. One hour after the administration of drugs a sub-cutaneous injection of **0.1ml** of 1%/W/V of carrageenin in water was made into planter surface of both the Hind-paw of each rat.

Three hours after carrageenin injection, the Hind-paw volume was measured once again. Difference between the initial and final value were noted and compared.

This method is more suitable method for studying anti-inflammatory activity in acute inflammation.

**The effect of Nannari Ver Chooranam in acute anti-inflammatory activities.**

<b>Group</b>	<b>Dose volume orally</b>	<b>Initial reading</b>	<b>Final reading</b>	<b>Mean difference</b>	<b>Percentage Inflammation</b>	<b>Percentage Inhibition</b>
Control	Water 2 ml	1.1	1.85	0.75	100	-
Standard	Ibuprofen 20mg/100gm	1.3	1.35	0.05	6.6	93.4
Test drug	100mg/100gm	1.1	1.34	0.24	32	68

**Result:**

The drug Nannari Ver Chooranam has **significant acute – anti inflammatory action.**

## **CHRONIC ANTI-INFLAMMATORY STUDY BY COTTON-PELLETS GRANULOMA METHOD**

**Drug:**

Nannari Ver Chooranam

**Aim:**

To study the chronic anti-inflammatory activity of the drug in albino rats by cotton pellets implantation (granuloma) method.

**Procedure:**

Cotton pellets each weighing long was prepared and sterilized in an autoclave for about one hour less than 15 lbs atmosphere pressure. Nine Albino rats weighing between 100-200gm were selected and were divided into 3 groups. Each rat was anaesthetized with ether and cotton pellets were implanted subcutaneously in the groin, two in each side.

From the day of implantation, one group of animals received Nannari Ver Chooranam at a dose of 100mg/100gm of body weight.

On the eighth day the rats were sacrificed and the pellets were removed weighed. Then they were put in an incubator at 60°C-80°C and then weighed.

The concordant weight was noted for all groups and compared.

**The effect of Nannari Ver Chooranam in chronic anti inflammatory study.**

<b>Group</b>	<b>Dose/100mg Body weight</b>	<b>Pellet Weight</b>	<b>Pellet Weight of the Granuloma of drugs</b>	<b>Percentage of Inflammation</b>	<b>Percentage of inhibition</b>
Control	Water 2ml	10	250	100	-
Standard	Paracetamol- 20mg	10	55	22	78
Test drug	100mg	10	110	42	58

**Inference:**

The drug show **significant chronic – anti inflammatory action.**

**ACUTE ANTI – INFLAMMATORY STUDY ON  
SANGAN KUPPI VER ENNAI (EXTERNAL USE)  
BY HIND-PAW METHOD I ALBINO RATS**

**Aim:**

To study the acute anti-inflammatory activity of the test drug SANGAN KUPPI VER ENNAI.

**Preparation of the test drug:**

The Sangan Kuppi Ver Ennai was prepared as per the preparation in Padhartha guna vizhakam.

**Procedure:**

Six healthy albino rats weighing 100-150gm were taken and divided into three groups, each consisting of 2 rats.

First group was kept as control by giving distilled water of 2ml/100gm of body weight. The second group was kept as test group. The third group was given the standard drug.

Before application of the test drug the Hind-paw volume of all the rats were measured. This was done by dipping the Hind-paw (up to the tibio-femoral junction) into a mercury plethysmograph. While dipping the Hind-paw, by pulling the syringe piston, the level of mercury in the centre small tube was made to coincide with red marking and reading was noted from the plethysmograph.

One hour later, a sub-cutaneous injection of 0.1ml of 1%(w/r) Carrageenin water made into plantar surface of both Hind-paw of each rat. To the second (last) group keelvathathuku thylam was topically applied for three times over the inflamed surface in a thin layer for every 15mts for an hour. To the other group no drug was applied over the inflamed surface.

Three hour after injection the Hind-paw volume was measured once gain. The difference between the initial and final volume would show the amount of inflammation. Taking the volume in the control group as 100% of inflammation, anti-inflammatory effect of the test group is calculated.

#### **EFFECT OF SANGAN KUPPI VER ENNAI**

<b>Group</b>	<b>Drugs</b>	<b>Dose 100gm of body weight</b>	<b>Initial value</b>	<b>Final value</b>	<b>Difference</b>	<b>Percentage Inflammation</b>	<b>Percentage Inhibition</b>
Control	Water	2ml	1.1	1.85	0.75	100	-
Standard	Ibuprofen	20ml	1.3	1.35	0.05	6.6	93.4
Test drug	Keelvathathuku thylam.	Ext	1.0	1.25	0.25	33.3	66.7

**Inference:**

The test drug has **significant Anti-Inflammatory action** externally.

## ANNEXURE IV

### PROFORMA OF CASE SHEET

GOVERNMENT SIDDHA MEDICAL COLLEGE & HOSPITAL

POST GRADUATE DEPARTMENT

PALAYAMKOTTAI. TRIRUNELVELI – 627 002

Branch – III Sirappu Maruthuvam

Dissertation done by:

I.P. No	:	Occupation	:
Bed No	:	Income	:
Ward	:	Nationality	:
Name	:	Religion	:
Age	:	Date of Admission	:
Sex	:	Date of Discharge	:
Permanent Address:		Diagnosis	:
		Result	:
		Medical Officer	:

Complaints and duration:

History of present illness:

History of Previous illness:

Personal history including habits:

Family History :

Socio Economical Status :

Menstrual History :

## GENERAL CONDITIONS ON EXAMINATION

1. Consciousness :
2. General appearance :
3. Nourishment :
4. Anaemia :
5. Jaundice :
6. Cyanosis :
7. Clubbing :
8. Lymphadenopathy :
9. Jugular Venous Pulsation :
10. Pedal oedema :
11. Temperature :
12. Pulse :
  - Rate :
  - Rhythm :
  - Volume :
  - Character :
  - peripheral pulses :
  - Pulses paradoxus :
13. Respiratory Rate : /min
14. Heart Rate : /min
15. Blood pressure :
16. Miscellaneous :
  - Body Weight



## சித்த முறை தேர்வு

1. நிலம்  
குறிஞ்சி  
முல்லை  
மருதம்  
நெய்தல்  
பாலை
2. பருவ காலம்  
கார் காலம் (ஆவணி - புரட்டாசி)  
கூதிர் காலம் (ஐப்பசி - கார்த்திகை)  
முன்பனி ( மார்சுழி - தை  
பின்பனி ( மாசி- பங்குனி)  
இளவேனில் ( சித்திரை - வைகாசி)  
முதுவேனில் ( ஆனி - ஆடி)
3. யாக்கை (உடல்)  
வாதம்  
பித்தம்  
கபம்  
கலப்பு
4. குணம்  
சத்துவம்  
இராசதம்  
தாமசம்
5. பொறி புலன்கள்  
மெய் - ஊறு  
வாய் - சுவை  
கண் - ஒளி  
மூக்கு - நாற்றம்  
செவி - ஒலி

6. கன்மெந்திரியம்

கை - தானம்

கால் - கமனம்

வாய் - வசனம்

எருவாய் - விசர்க்கம்

கருவாய் - ஆனந்தம்

7. உட்காயம்

தோள் பொருத்து

புயம்

முழங்கை பொருத்து

சயம்

கைக்குளசு

கரபம்

அங்குலி

8. அதக்காயம்

இடுப்பு பொருத்து

தொடை

முழங்கால் பொருத்து

முன்கால்

குதிங்கால்

கரபம்

அங்குலி

9. வம்சி

10. மும்மலம்

மலம்

-

மூத்திரம்

-

வியர்வை

-

11. பிற உறுப்புகளின் நிலை

இருதயம்	-
புப்புசம்	-
இரைப்பை	-
கல்லீரல்	-
மண்ணீரல்	-
சிறுகுடல்	-
பெருங்குடல்	-
சிறுநீரகம்	-
மூளை	-
கருப்பை	-

12. உயிர் தாதுக்கள்

(அ) வாதம்	-
பிராணன்	-
அபானன்	-
வியானன்	-
உதானன்	-
சமானன்	-
நாகன்	-
கூர்மன்	-
கிருகரன்	-
தேவதத்தன்	-
தனஞ்செயன்	-
(ஆ) பித்தம்	
அனற் பித்தம்	-
இரஞ்சக பித்தம்	-
சாதக பித்தம்	-
ஆலோசக பித்தம்	-
பிராசக பித்தம்	-

(இ) கபம்

அவலம்பகம்	-
கிலேதகம்	-
போதகம்	-
தற்பகம்	-
சந்திகம்	-

13. உடல் தாதுக்கள்

சாரம்	-
செந்நீர்	-
ஊண்	-
கொழுப்பு	-
என்பு	-
மூளை	-
சுக்கிலம்/சுரோணிதம்	-

14. எண் வகைத்தேர்வுகள்

நாடி	-
ஸ்பரிசம்	-
நா	-
நிறம்	-
மொழி	-
விழி	-

மலம்

நிறம்	-
எடை	-
இறுகல்	-
இளகல்	-

சிறுநீர்

1 நீர்க்குறி

நிறம்	-
மணம்	-
எடை	-
நுரை	-
எஞ்சல்	-

2. நெய்க்குறி

### LABORATORY INVESTIGATION

Before Treatment

After Treatment

1. BLOOD:

TC : cells/ cu. mm

DC : P %

L %

E %

M %

ESR :

½ hour : mm

I hour : mm

Hb :

Blood Sugar :

Blood Urea :

Serum Cholesterol :

Uric Acid :

VDRL :

2. URINE

Albumin :

Sugar :

Deposits :

- 3. Motion
- Ova :
- Cyst :
- 4. IMMUNOLOGICAL :
- RA Factor :
- 5. RADIOGRAPHIC FINDINGS :
- 6. SEROLOGICAL TEST FOR SYPHILIS :
- 7. SYNOVIAL FLUID ANALYSIS :
- 8. ARTHROGRAPHY :

## **EXAMINATION OF LOCOMOTOR SYSTEM**

### **INSPECTION**

#### **Overlying Skin:**

- Colour :
- Scars and ulcers :
- Periarticular swelling :
- Deformity :
- Unusual posture :
- Muscle changes :
- Symmetrical distribution :
- Gait :

#### **Palpation:**

- Skin Temperature :
- Crepitus :
- Sub-cutaneous nodules :
- Rheumatoid vasculitic lesion:
- Lymphadenopathy :

**Enlargement:**

- Soft Tissues :
- Bony Enlargement :
- Range of Movements :

**Examination of individual joints:**

- Cervical Spine :
- Thoracic Spine :
- Lumbar Spine :
- Sacro-illac Joint :
- Shoulder Joint :
- Elbow Joint :
- Wrist Joint :
- Metacarpophalangeal joint :
- Interphalangeal Joint :
- Hip Joint :
- Knee joint :
- Metatarso phalangeal Joint:

Examination of individual joints (Affected Joints)

Measurement (in cm) :

Before and After Treatment:

	RIGHT		LEFT	
	BEFORE	AFTER	BEFORE	AFTER
Knee Joint				
Ankle Joint				
Wrist Joint				
Elbow joint				
Index finger				
Middle finger				
Ring finger				
Little finger				

### EXAMINATION OF OTHER SYSTEMS:

1. Respiratory system :
2. Cardio Vascular system :
3. Gastro Intestinal system :
4. Central Nervous system :
5. Genito – Urinary System:

### DAILY PROGRESS

DATE	SYMPTOMS	DRUG

### CLINICAL PARAMETERS AND PROGRESS

S.No	Clinical Feaures	During I day of Admission	5 <sup>th</sup> day	10 <sup>th</sup> day	15 <sup>th</sup> day	20 <sup>th</sup> day	25 <sup>th</sup> day	30 <sup>th</sup> day	40 <sup>th</sup> day
1	Pain in Joints								
2	Early Morning Stiffness								
3	Tenderness and swelling of joints Knee Ankle Wrist MCP PIP								



4	Depression								
5	Loss of appetite								
6	Fever								
7	Restriction of Joints Movements								
8	Sub cutaneous nodules								
9	Deformity								
10	Muscle Weakness								
11	Muscle Wasting								
12	Ulnar Deviation								
13	Entrapment Neuropathy								

+++ - Severe, ++ - Moderate, + - Mild, - - Nil

**DIFFERENTIAL DIAGNOSIS**

- 1.
- 2.
- 3.

**FINAL DIAGNOSIS:**

**LINE OF TREATMENT**

**MEDICINE**

- 1
- 2

**MEDICAL ADVICE**

**GOVERNMENT SIDDHA MEDICAL COLLEGE HOSPITAL,  
 POST GRADUATE RESEARCH CENTRE,  
 PALAYAMKOTTAI, TIRUNELVELI-627 002  
 BRANCH – III SIRAPPU MARUTHUVAM.  
 ADMISSION-DISCHARGE SHEET FOR “AZHALKEEL VAYU”**

IP No : Occupation :  
 Bed No : Income :  
 Ward : Nationality :  
 Name : Religion :  
 Age : Date of Admission :  
 Sex : Date of Discharge :  
 Permanent Address : Diagnosis :  
 Result :  
 Temporary Address: Medical officer :

**CLINICAL PICTURES**

Sl.No.	During Admission	During Discharge

**PLACE:**

**DATE:**

**Signature of Medical Officer.**

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List of In Patients of PG III - Sirappu Maruthuvam Department

Given 1) NANNARI VER CHOORANAM as Internal Medicine

2) SANGAN KUPPI VER ENNAI as External Medicine for AZHAL KEEL VAYU

Haematological Investigation

S.No	Name	IP No	Age	Sex	D.O.A	D.O.D	Haematological Investigation																X-ray	No. of Days	Results									
							BT						AT						BS	BU	SC	Urine Analysis						Motion test						
							Tc	DC %			ESR mm hrs		Hb %	Tc	DC %			ESR mm hrs				Hb %				BT			AT			Ova	Cyst	
								P	L	E	1/2	1			P	L	E	1/2								1	Alb	Sug	Dep	Alb	Sug			Dep
1	Dhasan	1072	55	M	28.04.08	26.05.08	9,600	48	49	3	40	79	78	9,800	55	43	2	25	57	80	321	21	122	N	+++	FEC	N	N	NAD	N	N	Rt. OA	29	Improved
2	Muppidathi	1230	50	M	15.05.08	1.06.08	9,400	60	32	8	7	14	78	9,800	55	43	2	25	57	80	75	28	221	N	N	NAD	N	N	NAD	N	N	Bil. OA	18	Par.Improved
3	Pappammal	1240	45	F	16.05.08	10.06.08	10,000	73	25	2	15	33	68	9,600	56	39	5	8	7	81	80	22	204	N	N	NAD	N	N	NAD	N	N	Bil. OA	26	Improved
4	Petchiammal	1287	63	F	21.05.08	05.06.08	9,600	50	40	10	10	20	68	10,100	65	33	2	12	25	70	128	20	149	N	N	NAD	N	N	NAD	N	N	Bil. OA	16	No. Progress
5	Thenammal	1297	55	F	21.05.08	09.06.08	9,200	60	34	6	16	37	61	9,800	60	32	8	8	16	70	172	27	210	N	N	NAD	N	N	NAD	N	N	Bil. OA	19	Improved
6	Shunmugam	1313	64	M	23.05.08	18.06.08	8,200	60	35	5	40	80	71	9,400	62	35	3	11	25	65	88	25	140	N	N	NAD	N	N	NAD	N	N	Bil. OA	27	Improved
7	Padhmavathi	1323	56	F	23.05.08	08.06.08	9,000	65	30	5	16	33	70	9,200	66	31	3	12	28	71	75	31	160	N	N	FEC	N	N	NAD	N	N	Bil. OA	17	Par.Improved
8	Rathinam	1401	60	F	03.06.08	19.06.08	9,000	66	30	4	15	35	68	9,200	64	32	4	11	33	70	105	22	170	N	N	NAD	N	N	NAD	N	N	Bil. OA	17	Par.Improved
9	Sumathi	1581	65	F	19.06.08	08.07.08	8,500	60	38	2	30	60	45	8,600	63	35	2	20	40	65	88	21	150	N	N	NAD	N	N	NAD	N	N	Bil. OA	19	Improved
10	Esakkiammal	1596	63	F	20.06.08	16.07.08	10,100	58	36	6	17	38	62	10,200	65	30	5	12	26	66	125	28	190	N	N	FEC	N	N	NAD	N	N	Bil. OA	27	Improved
11	Muthammal	1600	60	F	21.06.08	08.07.08	8,900	71	27	2	10	22	65	9,000	68	30	2	7	14	70	98	31	228	N	N	FEC	N	N	NAD	N	N	Bil. OA	18	Par.Improved
12	Chidambarathammal	1601	55	F	21.06.08	08.07.08	10,000	72	24	4	4	9	65	10,100	66	30	4	6	15	71	90	24	156	N	N	FEC	N	N	NAD	N	N	Bil. OA	18	Par.Improved
13	Vanitha	1632	50	F	25.06.08	17.07.08	9,500	65	30	5	3	8	77	9,600	68	28	4	7	14	78	85	21	180	N	N	FPC	N	N	NAD	N	N	Bil. OA	23	Improved
14	Esakki	2025	70	M	05.08.08	28.08.08	12,000	25	72	3	17	35	65	11,500	45	50	5	14	29	72	118	27	138	N	N	OPC	N	N	NAD	N	N	Bil. OA	23	Improved
15	Saroja	2205	45	F	22.08.08	11.09.08	8,800	70	28	2	4	8	70	9,000	65	31	4	4	7	73	82	27	182	N	N	FPC	N	N	NAD	N	N	Bil. OA	21	Par.Improved
16	Ayyappan	2231	55	M	23.08.08	08.09.08	9,200	50	48	2	6	12	70	9,400	55	40	5	5	12	70	122	24	180	N	N	OPC	N	N	NAD	N	N	Bil. OA	17	Par.Improved
17	Latheep	2276	65	M	28.08.08	15.09.08	9,700	62	32	6	8	19	76	9,800	64	31	5	7	14	77	160	30	196	N	N	NAD	N	N	NAD	N	N	Bil. OA	18	No. Progress
18	Subbiah	2290	70	M	29.08.08	29.09.08	12,000	25	72	3	17	35	65	11,400	48	46	6	14	31	70	118	22	138	N	N	FEC	N	N	NAD	N	N	Bil. OA	31	Improved
19	Pappathi	2751	72	F	22.10.08	10.11.08	9,100	60	32	8	1	3	70	9,200	64	30	6	4	8	70	96	21	160	N	N	NAD	N	N	NAD	N	N	Bil. OA	19	Par.Improved
20	Kaliammal	2803	42	F	31.10.08	26.11.08	6,800	60	38	2	7	15	68	7,000	65	33	2	6	13	70	138	26	170	N	N	FEC	N	N	NAD	N	N	Bil. OA	27	Improved

EC - Epithelial Cells, PC - Pus Cells,

N - Nil

NAL No Abnormal Deposit

**LIST OF OUT PATIENTS OF PG III - SIRAPPU MARUTHUVAM DEPARTMENT**

Given 1) NANNARI VER CHOORANAM as Internal Medicine

2) SANGAN KUPPIVER ENNAI as External Medicine for AZHAL KEEL VAYU

S.No	NAME	Age	Sex	O.P. No.	SIGNS AND SYMPTOMS					No.of Days	RESULT
					PAIN	SWELLING	M.S	CREPITATION	L.O.M		
1	NALLAKANNU CHETTIYAR	71	M	27451	+	+	+	+	+	75	Par.Improved
2	KULASI	43	F	28198	+	-	+	+	+	70	Improved
3	DEVA DOSS	56	M	29446	+	+	+	+	+	71	Par.Improved
4	KANNIAH	52	M	29289	+	-	+	+	+	66	Improved
5	PUSHPAM	60	F	29366	+	+	+	+	+	72	Improved
6	JEORGE JOSEPH	50	M	29435	+	-	+	+	+	62	Improved
7	MADASAMY	54	M	29374	+	-	+	+	+	65	Improved
8	SANKARAMMAL	54	M	29576	+	-	+	+	+	60	Improved
9	GOMATHI	38	F	30013	+	-	+	+	+	59	Improved
10	SUBRAMANIAN	65	M	30768	+	+	+	+	+	65	No.Progress
11	ARJUNAN	57	M	30958	+	-	+	+	+	63	Par.Improved
12	GURUSAMY	59	M	31190	+	+	+	+	+	62	Improved
13	PERUMALAMMAL	42	F	31409	+	-	+	+	+	64	Improved
14	AMEENA	47	F	31793	+	+	+	+	+	57	Par.Improved
15	MEENA	45	F	33110	+	-	+	+	+	53	Improved
16	ARUMUGAM	58	M	49389	+	+	+	+	+	54	Par.Improved
17	VISWALAKSHMI	54	F	49386	+	+	+	+	+	52	Improved
18	SETHU	64	M	51960	+	-	+	+	+	41	No.Progress
19	LATHA	46	F	56197	+	-	+	+	+	25	Improved
20	MANONMANI	52	F	57801	+	+	+	+	+	15	No.Progress

M.S - Morning Stiffness

L.O.M - Limitation of Movements