

**A STUDY ON  
MEGA THIMIRAM**

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## INTRODUCTION

Medicine, as every one knows is not merely a science but an art as well. There are different systems of medicine in the world, according to their way of life with their geographical conditions.

The siddha system of medicine is one of the pillars of Indian system of medicine. It is dedicated bequest of siddhars.

The siddha system of medicine is the most holistic medical system in the world. It is the mother of all healing arts in our planet and it predates of all healing sciences.

Siddha system considers not merely body alone, but also the soul. Siddha is a Tamil word, that is derived from its root “Sidh” (சித்) which means “Perfection in life” or “Heavenly bliss”. The Siddhars have blessed this world with ways and means for a healthy life and to reach the life’s goal i.e veeduperu or mukthi.

Siddha system is the first system to emphasize health as a perfect state of physical, psychological, social and spiritual component of a human being. This explanation is quoted in “Thirumanthiram” which is pioneer word by saint Thirumoolar as follows.

“மறுப்பதுடல் நோய் மருந்தென லாகும்  
மறுப்ப துளநோய் மருந்தெனச் சாலும்  
மறுப்பதினி நோய் வாரா திருக்க  
மறுப்பது சாவை மருந்தென லாமே”

- திருமூலர் திருமந்திரம்

which translate as

one that cures physical ailment is medicine

one that cures psychological ailment is medicine

one that prevents ailment is medicine

one that bestows immortality is medicine

Thus, siddhars insisted everything without health is nothing and healthy body is the only tool through which one can attain “Eternal Bliss” . Siddhars had written their works on subjects namely, Asanams ( yoga), Maruthuvam ( Medicine), Rasavadham (Alchemy), Gnam ( Philosophy) etc., It declares that human body is made up of 96 basic principles or thathuvas. These thathuvas are universally applicable to all human beings and it also exist in universe also,

“அண்டத்தில் உள்ளதே பிண்டம்  
பிண்டத்தில் உள்ளதே அண்டம்  
அண்டமும் பிண்டமும் ஒன்றே  
அறிந்துதான் பார்க்கும் போதே”

- சட்டமுனி

Nature is man and man is nature and therefore both are essentially one. Man is said to be microcosm and the universe is macrocosm “what exists in the universe exists in man”. Man is a miniature of the universe because the composition in both is same as per siddha philosophy. According to siddha the five basic elements (panchabootham) are present in all living and non-living things of the universe in various proportions.

Siddhars in their attempt to elevate themselves to a perfected earthly immortal (attain siddhi) developed techniques, which included controlled breathing (Vaasi), concentration of mind, intense meditation (Dhyanam), besides dietary regimen and certain postures ( Yoga) for psychosomatic harmony.

The paramount aim and object of siddhars is to attain enlightenment for which they needed a strong body, sound mind and longer lifespan. In pursuit of such endeavors they developed a science which encompassed medicine, yoga, rejuvenation techniques, alchemy, varma, tantrism etc. The prime aim was diluted in the later centuries and the practice was intended towards leading a very long life with some supernatural powers. This was largely reduced now a days that only the therapeutic and clinical aspects of the science is largely in practice.

The basic principles of the siddha system consist of panchabootham theory, Trihumoural pathology and 96 basic factors. In siddha system of medicine, the understanding of the trihumoural status is very essential. The humours vaatha, pitha and kabha exists in the ratio of 4:2:1 in normal physiological status in man. Any imbalance or deviation from this state leads to diseases or death will be the result.

The diagnosis in siddha system of medicine is made by eight fold examination called envagai thervugal which includes the examination of Naadi (pulse), Sparisam (touch) Naa (tongue), Niram (colour), Mozhi (speech), Vizhi (eyes), Malam (faeces), Moothiram (urine). Out of the eight, considerable importance is laid in the examination of naadi or pulse. Examination of pulse in siddha system of medicine is not just assessing the rate and rhythm. Pulse is considered as the “cosmic energy” (praana). A siddha physician by examining the naadi coupled with intuition distinguishes the changes in humours, the vitiated humour is brought to normal by administering appropriate drugs. The choice of drug is made by assessing the panchaboothic constituent of the drug. The panchaboothic constituent of the drug is assessed by the six tastes (Arusuvai), since each taste consist of different combination of the five elements.

Ancient Siddhars classified the diseases into 4448. A vivid explanation of each and every disease and the medicaments were found in various texts one among the diseases is“Mega thimiram” comes under the head “Thimiram”, which falls under “Karuvizhi noigal” according to text **“Nagamuni nayana vidhi- 200”**

The author has selected the disease **“Mega thimiram”** and has made a sincere attempt to review various literatures and a thorough study of the disease.

## SIDDHA PHYSIOLOGY

Physiology is the science deals with bodily changes which explains the physical and chemical factors that are responsible for origin, development and progression of life.

The siddha criteria greatly explains above all changes of human body on the basis of '96' Thathuvas.

These 96 basic principles are structural units of the body.

Apart from this, the body rely on

7 physical constituents - Udal Katukkal

6 tastes - Suvaigal

14 reflexes - Vaegangal

3 Immunities - Udal vanmai

4 Body fires -Udal thee

### 96 THATHUVANGAL

Yugi quoted the principles of vaethantha thathuva kattalai and the 96 thathuvas as follows,

“உறுதியாம் பூதாதி யோரைந்தாம்

உயர்கின்ற பொறி யைந்து புலனைந்தாம்

கருதியாங் கன்மவிந் திரியமைந்தும்

கடிதான ஞானவிந் திரியமைந்தும்

திருதியாந் தீதாய கரண நான்கும்

திரமான அறிவொன்றும்.....”

Taking Pancha Boothas as the main principle almost all the 96 physiological factors comes under the five boothas.

The 5 elements	-	ஐம்பூதம்
The 5 sense of organs	-	ஐம்பொறி
The 5 object of senses	-	ஐம்புலன்
The 5 organs of action	-	கன்மேந்திரியம்
The 5 organs of perception	-	ஞானேந்திரியம்
The 4 intellectual faculties	-	அந்தகரணம்
The 10 Nerves	-	தசநாடி
The 5 states of the soul	-	பஞ்சாவஸ்தை
The 3 principles of moral evil	-	மும்மலம்
The 3 cosmic qualities	-	முக்குணம்
The 1 wisdom	-	அறிவு
The 3 humours	-	முப்பிணி
The 3 physical bindings	-	ஏடனை
The 3 regions	-	மும்மண்டலம்
The 8 predominant passions	-	எண்விகாரம்
The 6 stations of the soul	-	ஆறாதாரம்
The 7 Physical constituent elements of the body	-	ஏழுவகைத் தாது
The 10 vital airs	-	தசவாயு
The 5 cases of sheath of the soul	-	பஞ்சகோசம்

## **I. Pancha Bootham (The five elements)**

“நிலம் நீர்தீவளி விசும் போடைந்தும்

கலந்தமயக்க முலக மாதலின்”

- தொல்காப்பியம்

1. Vin (Ether)
2. Vali (Air)
3. Thee (Fire)
4. Neer (Water )
5. Mann (Earth)

The human anatomy and physiology, causative factors of the disease, the materials for treatment and cure of disease, the food for substances all fall within the five elemental categories.

## **II. Pori 5 (The five sense organ)**

1. Mei (Skin)
2. Vaai (Tongue)
3. Kann (Eyes)
4. Mooku (Nose)
5. Saevi (Ears)

## **III. Pulan 5 (Five objects of sense)**

1. Sapham (Sound)
2. Sparisam (Sensation)
3. Rubam (Vision)
4. Rasam (Taste)
5. Kandham (Smell)

#### **IV. Kanmaenthiriyam – 5 (Five organs of action)**

1. Karuvaai (Reproductive orifice)
2. Eruvaai (Anal orifice)
3. Kai (Upper limb)
4. Kaal (Lower limb)
5. Vaai (Mouth)

#### **V. Gnanendhriyam – 5 (Five organs of perception)**

1. Vasanam – Speech
2. Kamanam – Walk
3. Thaanam – Work (giving, taking)
4. Visarkkam – Sweating, motion, voiding
5. Aaanandham – Semen or ovum voiding

#### **VI. Anthakaranam – 4 (Four intellectual faculties)**

1. Manam – Mind (or ) Thinking faculty
2. Puthi – Knowledge (or ) Sense of proportion
3. Siddham – The deciding faculty
4. Agangaram – Achievement faculty

#### **VII. Arivu – 1**

Intellect (or) Wisdom

#### **VIII. Naadi -10 (Ten pulse)**

1. Edakalai – Runs from right big toe to left nostril
2. Pinkalai – Runs from left big toe to right nostril
3. Suzhumunai – Passes through both nostrils

4. Siguvai – It helps in swallowing of food and water
5. Purudan – Present in the right eye
6. Kaanthari – Present in the left eye
7. Atthi – Present in the right ear
8. Alambudai – Present in the left ear
9. Sangini – Present in the reproductive organs
10. Gugu – Present in the anus.

**IX. Vaayu -10 (Ten vital force)**

1. Abanan
2. Pranan
3. Udhanan
4. Samanan
5. Vyanan
6. Nagan
7. Koorman
8. Kirugaran
9. Devadhatan
10. Dhananjayan

**X. Asayam – 5 (Five visceral cavities)**

1. Amarvasayam – It lodges the ingested food.
2. Pakirvasayam – It digests food, help in separation and absorption of saaram from the diested food.

3. Malavasayam – Responsible for the expulsion of ingested food part and flatus.
4. Salavasayam – Responsible for the formation and excretion of urine.
5. Sukkilavasayam – Place for the formation and growth of the Sperm and ovum.

#### **XI Kosam – 5 (Five vestures of the soul)**

1. Annamayakosam – Made up of seven udal kattugal.
2. Pranamayakosam – Conjunction of pran and kanmenthiriyam.
3. Manomayakosam – Conjunction of manam and gnanenthiriyam.
4. Vingnanamayakosam – Conjunction of puthi and gnanenthiriyam.
5. Aanandhamayakosam – Conjunction of pran and suzhuthi.

#### **XII. Aatharam -6 (Six stations of the soul)**

1. Moolatharam – It lies between anus and genitalia.
2. Swathistanam – It lies 2 inches above moolatharam.
3. Manipooragam – It lies 8 inches above swathistanam.
4. Anagatham – It lies 10 inches above manipooragam.
5. Vishuthi – It lies 10 inches above anagatham.
6. Aaginai – It lies in between two eyebrows.

### **XIII. Mandalangal – 3 (Three regions)**

1. Agni – Fire.
2. Gnayiru – Solar plexus.
3. Thingal – Lunar plexus.

### **XIV. Malam – 3 (Three moral evils)**

1. Aanavam – Pride (or) Arrogance.
2. Kanmam – Selfishness and desire towards other's things.
3. Maayai – Illusion or false interpretation to an external sensory stimulus.

### **XV. Dosham- 3 (Three humours)**

The three humours are the fundamental principles and essential factors in the composition and constitution of the human body. The three humours are,

- |                 |   |             |
|-----------------|---|-------------|
| Vaatham (Wind ) | - | Vin + vali  |
| Pitham (Bile)   | - | Thee        |
| Kabham (Phlegm) | - | Neer + Mann |

**Vaatham** represents mind, dryness, pain, sensitiveness, lightness and also air. It is of 10 types.

**Pitham** represents gastric juice, bile, energy, heat, inflammation, anger and irritation. It is of 5 types

**Kabham** represents feeling of cold, heaviness, running nose, passing of secretions and also saliva. It is of 5 types.

## Formation of three humours

Vaatham - Edakalai + Abanan

Pitham - Pinkalai + Pranan

Kabham - Suzhumunai + Samanan

“வந்த கலை மூன்றில் வாயிவா மபானனுடன்  
தந்த பிராணன் சமானனும் - சந்தமுறக்  
கூட்டுறவில் ரேகித்தல் கூறும் வாதம் பித்தம்  
நாட்டுங் கபமேயாம் நாடு”

“வாதமாய் படைத்து  
பித்த வன்னியாய் காத்து  
சேத்தும சீதமாய் துடைத்து”

Vaatham - Creation

Pitham - Protection

Kabham - Destruction

“மெய்யளவு வாதமொன்று  
மேல் பித்தம் மோரையையாம்  
ஐயங்காலென்றே அறி”

Vaatham - 1

Pitham - ½

Kabham - ¼

The physiological functions of the body as mediated by 3 humours are made up of five basic elements. These three functional factors maintain the integrity of the human body.

### **XVI. Edanai - 3 (Three physical bindings)**

1. Porul pattru - Material bindings
2. Puthalvar pattru - Offspring bindings
3. Ulaga pattru - Worldly bindings

### **XVII. Gunam - 3 (Three cosmic qualities)**

1. Sathuva gunam - goodness or virtue
2. Rasatha gunam - manifestation of passion, pride, courage, zeal etc.
3. Thamatha gunam - qualities of darkness or ignorance manifested as lethargy, sleep, lust and anger etc.

### **XVIII. Ragam - 8 (Eight predominant passions)**

1. Kaamam - desire
2. Krotham - hatredness
3. Lobam - stingy
4. Moham - lust
5. Matham - pride
6. Marcharyam - internal conflict
7. Idumbai - mockery
8. Agankaram - ego or self love

### **XIX. Avasthal - 5 (Five states of consciousness)**

- |                 |   |                  |
|-----------------|---|------------------|
| 1. Nanavu       | - | Awareness        |
| 2. Kanavu       | - | Dream            |
| 3. Urakkam      | - | Sleep            |
| 4. Perurakkam   | - | Stupor           |
| 5. Uyirpadakkam | - | State of samathy |

### **XX. Vinai - 2 (Two deeds)**

- |               |   |            |
|---------------|---|------------|
| 1. Nal vinai  | - | good deeds |
| 2. Thee vinai | - | bad deeds  |

### **UDAL THATHUKKAL – 7 (Seven physical constituents)**

“இரசம் உதிரம் இறைச்சி தோல் மேதை  
மருவி வத்தி யெழும் பொடு மச்சை  
பரவிய சுக்கிலம் பாழாம் உபாதி  
உருபம லாலுடல் ஒன்றென வாமே”

Above, udal thathukkal maintain the functions of different organs, systems and vital parts of the body. They play a very important role in development and nourishment of body.

The udal thathus are also the part of biological protective mechanism and are nourished one by one and it takes seven days to attain its full nourishment.

1. Saaram (Chyle)
2. Seeneer (Blood)
3. Oon (Muscle)
4. Kozhuppu (Fat)
5. Enbu (Bone)
6. Moolai (Bone marrow)
7. Sukkilam (or) suronitham (sperm / ovum )

#### **VEGANGAL 14 (The fourteen reflexes)**

“பதினான்கு வேகப் பெயர்கள்

பகர்ந்திட அவற்றைக் கேளாய்

விழித்திடும் வாதந் தும்மல்

மேவுநீர் மலங் கொட்டாவி

கதித்திடு பசிநீர் வேட்கை

காசமோடிளைப்பு நித்திரை

மதித்திடு வாந்தி கண்ணீர்

வளர் சுக்கிலஞ் சுவாசமாமே”

- மருத்துவ தனிப் பாடல்கள்

In our body there includes 14 urges and it should be distributed as reflexes. The 14 reflexes are,

1. Vaatham (flatus)
2. Thummal (sneezing)
3. Siruneer (Urine)

4. Malam (Stool)
5. Kottavi (Yawning)
6. Pasi (Hunger)
7. Neervaetkai (Thirst)
8. Kasam (Erumal, cough)
9. Elaippu (Fatigue / Exhaustion)
10. Nithirai (Sleep)
11. Vanthi (Vomit)
12. Kanneer (Tear)
13. Sukkilam or suronitham (Genital secretion)
14. Suvasam (Respiration)

If the urges are suppressed they lead to some sort of ailments.

#### **SUVAIGAL - 6 (Six tastes)**

- |                            |   |              |
|----------------------------|---|--------------|
| 1. Inippu (Sweet)          | - | Mann + Neer  |
| 2. Pulippu (Sour )         | - | Mann + Thee  |
| 3. Uppu (Salt)             | - | Neer + Thee  |
| 4. Kaippu(Bitter)          | - | Vayu+Aakayam |
| 5. Kaarppu (Pungent)       | - | Vayu + Thee  |
| 6. Thuvarppu (Astringent ) | - | Mann + Vayu  |

### **UDAL VANMAI - 3 (Three immune status)**

1. Iyarkkai vanmai - It is inherited vitality
2. Kaala vanmai - Vitality that is generally found in different age and periods
3. Seyarkkai vanmai - Improvement of vitality obtained by good habits, physical exercise and proper diet.

Vanmai is mainly based on one's healthy condition, and it differs from one another by nature, seasonal variation, drugs and diet.

### **Udal Thee - 4 (Four body fires)**

The body fires are concerned with digestion

1. Samanakini - To maintain normal complete digestion
2. Manthakini - Delayed digestion
3. Theekshanakini - Quick fast digestion
4. Vishamakini - Incomplete digestion leading to toxicity

## SIDDHA PATHOLOGY

Siddha pathology deals with the aetiology, pathogenesis and the clinical features of diseases. Siddha medicine accepts to trihumoural pathology and diseased conditions are attributed to imbalance in normal physiological status of humours.

“மிகினும் குறையினும் நோய்செய்யும் நூலோர்  
வளிமுதலா வெண்ணிய மூன்று”

- திருக்குறள்

When the 1: ½ : ¼ normal proportion of the uyir thathus are disturbed. It leads to mukkutram (diseased condition)

Much importance is laid on humoural composition of the body and their normal functioning is influenced by a number of exogenous and endogenous factors. The most important factors among them are as follows.

- Abnormal food habits
- Inappropriate physical activities
- Seasonal and environmental variations
- Withholding natural reflexes
- Alterations in 7 physical constituents

## Abnormal food habits

According to Thiruvalluvar versus,

“மாறுபா டில்லா உண்டி மறுத்துண்ணி  
னூறு பாடில்லை உயிர்க்கு”

- திருக்குறள்

“உணவே மருந்து, மருந்தே உணவு”

This famous proverb has become almost the motto of siddha medicine. Immense importance is given to the diet. Siddha principles are formulated according to seasonal and environmental variation. A complete food containing Six taste (arusuvai) is to be taken by normal individual. A special diet regimen for each diseased condition is advocated according to the trihumoural variation of the disease and humoural composition of the individual patient. If they are followed strictly disease never arise.

The arusuvai constituent of food substances is important as any excess or decrease of them will cause disease. They are corrected by appropriate composition of food containing particular taste. The following poem explains how humours are altered by the taste.

“புளிதுவர்விஞ் சங்கறியாற் பூரிக்கும் வாதம்  
ஒளியுவர்கைப் பேறில் பித்துச் சீறும் - கிளிமொழியே  
கார்ப்பினிப்பு விஞ்சிற் கபம் விஞ்சுஞ் சட்டிரதச்  
சேரப்புணர் நோயணு காதே”

- ❖ Sour and astrigent – increases vatham
- ❖ Salt and bitter – increases pitham
- ❖ Pungent and sweet – increases kabham

### **Environmental variations**

The place where the people are living is also responsible for disease (Thinai).

1. Kurinji – Kabham resides there further anemia, fever, abdominal mass may develop.
2. Mullai – Vaatham and pitha diseases predominate.
3. Marutham – All the thoshas will be maintained in balanced state.
4. Naeithal – Vaatha disease with increased body mass, liver enlargement and flatulence.
5. Paalai – All thoshas are disturbed and all sort of ailments may supervene.

### **Seasonal variations**

One year is classified into six seasons each one constituting 2 months. Alteration in characters of the three humour occurs due to seasonal variations.

- ❖ In Kaarkaalam - (All the 3 humours are disturbed, pitham altered from its normal state, aggravated vaatha spread to other areas.

- ❖ In Koothirkaalam - (Altered pitham spreads to other areas, vaatham is in normal state).
- ❖ In Munpanikaalam - (Pitham is in normal state).
- ❖ In Pinpanikaalam - (Kabham is altered from its nature).
- ❖ In Elavaenilkaalam - (Altered kabham spread to other parts).
- ❖ In Muthuvaenilkaalam - (Kabham is in normal state, vaatha disease aggravates).

### **Udal Thathukkal - 7(Physical constituents)**

When the three humours of the body are affected by various factors they immediately change the nature of the physical constituents.

#### **1. Saaram (Chyle)**

If increased, shows symptoms of increased kabham like decreased appetite, excess salivation and excessive sleeping.

If decreased, loss of weight, lassitude, dryness of skin, and the function of sense organs are diminished.

#### **2. Seneer (Blood)**

If increased, blood pressure increases with redness of eye, haematuria, boils, tumours, splenomegaly and jaundice.

If decreased there will be tiredness, dryness, anemia and lassitude.

### **3. Oohn (Muscle)**

If increased, excess muscle mass around the cheek, face, abdomen, thigh, genitalia etc.,

If decreased, muscle wasting with lethargic sense organs.

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

If increased, identical features of increased oohn like excess fatty tissue around the cheek, neck, face, abdomen, thigh and genitalia occurs.

If decreased, loin pain, emaciation and splenomegaly.

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

If increased, ossification and dentition are quickened.

If decreased joint pain along with easy falling of nail, hair and teeth.

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

If increased, heaviness of body and eyes, swelling of interphalangeal joint, oliguria and non healing ulcers occur.

If decreased, osteoporosis and blurred vision occurs.

### **7. Veneer (Sperm / Ovum)**

If increased, excess sexual activity with calculi formation.

If decreased there will be pain in the genitalia and unable to reproduce.

## **14 Reflexes**

The 14 urges should not be self suppressed. If suppressed they show the following symptoms.

### **1. Vaatham (Abanavayu – flatus)**

If abanavayu is suppressed it leads to Chest pain, Ulcer pain, Abdominal pain, Body pain, Constipation, Indigestion and Liver disorders predominate.

### **2. Thummal – Sneezing**

If thummal is arrested it leads to Headache, Facial pain, Low back ache, Neuritic pain in sense organs are felt.

### **3. Siruneer - Urine**

If controlled it leads to Urinary tract complications and joint pain.

### **4. Malam - Faeces**

If malam is suppressed it leads to Flatulence, Weakness, Headache, Knee joint pain may originate.

### **5. Kottavi - yawning**

If kottavi is controlled it may lead to Lethargic Face, Indigestion, Mega noi may occur.

### **6. Pasi - Hunger**

If pasi is ignored all organs get tired, Pricking pain all over the body, Schizophrenia, Emaciation may occur.

## **7. Neervatukai - Thirst**

Without water, all cells of the body will get tired and pain supervenes.

## **8. Kasam – Cough**

If kasam is suppressed it may cause Chest pain and Heart diseases.

## **9. Elaippu – Relaxation**

If there is no rest, Fainting and Mega diseases may occur.

## **10. Nithirai – Sleep**

If nithirai is disturbed, it will lead to Headache, Pain in the eyes, Deafness and Speech disturbances.

## **11. Vanthi – Vomiting**

If vomiting is suppressed, it will lead to Itching, Anemia and Eye diseases.

## **12. Kanneer – Tears**

If controlled, it leads to Sinusitis, Headache, Eye disease and Chest pain.

## **13. Sukkilam – Semen**

If sukkilam is suppressed, there will be Joint pain, Difficulty in urination, Fever and Chest pain.

## **14. Swasam – Breathing**

If swasam is suppressed Cough, Abdominal discomfort and Anorexia may arise.

## **Three humours (Tridhosam)**

The three physical elements of the external world that is air, heat and water for the three fundamental principles on which the constitution of human being has been based. The three elements as they enter the body, are called Tridhosam that is vaatham (wind) pitham (bile) kabham (phlegm). The three humours maintain the human body through their combined functioning. Any imbalance in them bring about diseases.

### **1. Vaatham (Wind)**

#### **A. Features of exaggerated vaatham**

Body pain, joint pain, pricking pain, astringent taste, black stools and urine, difficulty in flexion and extension of limbs, generalized weakness, constipation and mental distress.

#### **B. Features of decreased vaatham**

Pain in the body, low pitch voice, difficulty in doing work, impairment of intelligence, giddiness, syncope and symptoms of increased kabham.

### **2. Pitham (Fire)**

#### **A. Features of exaggerated pitham**

Yellowish discolouration of eyes, skin, motion and urine, increased appetite and thirst, burning sensation all over the body and decreased sleep.

## **B. Features of decreased pitham**

Decreased appetite, cold, symptoms associated with defective growth of kabham

## **3.KABHAM (Phlegm)**

### **A. Features of increased Kabham**

The body fire is decreased, increased salivation, a fall in enthusiasm, feeling a sensation of body weight, pallor and cooling, dyspnoea, cough, abdominal distension and excessive sleep.

### **B.Features of decreased Kabham**

Giddiness, dryness of joint, decreased kabham in lungs, having a feeling of absence of lung, increased sweating and palpitation.

### **Piniyari Muraimai (Diagnosis)**

“**Pini**” means the disease which affects the body. Any interruption of the normal functions of any body part, organ or system.

“**Ari**” means identify

“**Muraimai**” means rules

“**Piniyari muraimai**” is the method of diagnosing the disease affecting the people. It is based upon the following aspects.

1. Poriyalarithal
2. Pulanalarithal

3. Vinaathal
4. Envagai thervugal
5. Naadi paritchai.

### **Poriyalarithal and pulanalarithal**

Pori is considered as the five sense of perception namely Nose, Tongue, Eye, Skin and Ear while pulan are five object of sense, they are Smell, Taste, Vision, Sensation and Sound. Physician's pori and pulan are used as the tools for examine the pori, pulan of the patient.

### **Vinaathal:**

It has a procedure for gathering information about the patients name, age, occupation, nativity, socio – economic status, family history, dietary habits, allergic factors, period of suffering from the complaints, history of previous episodes, relevant history of habits and treatment etc., from the patient or from his immediate relatives, if the patient is not in person to speak or if the patient is child.

The above principles correspond to the methodology of inspection, palpation and interrogation of modern medicine

## ENVAGAI THERVUGAL

Eight different kinds of tests to be applied or attended by physician to arrive correct diagnosis. These are also called Attavitha paritchai or Attasthanna parikshai.

Envagai thervukal is considered as physician's instruments.

“நாடி பரிசம் நாநிறம் மொழி விழி  
மலம் மூத்திரம் இவை மருத்துவராயுதம்”

“மெய்குறி நிறந்தொளி விழி நாவிரு மலம் கைக்குறி”

- தேரையர்

Envagai thervugal are

1. Naadi (Pulse)
2. Sparisam ( palpation)
3. Naa (Tongue)
4. Niram (Colour)
5. Mozhi (Speech)
6. Vizhi ( Eye Examination)
7. Malam ( Motion examination)
8. Moothiram ( Urine examination)

## **Naadi (Pulse)**

Naadi is the vital force. Any changes in the three dhoshas are best diagnosed by feeling the naadi. Naadi is an important observation for diagnosis and prognosis. Naadi is responsible for the existence of life and can be felt one inch below the wrist on the radial side by means of palpation with the tips of index, middle and ring finger corresponding to vaatham, pitham and kabham in the ratio of 1: ½ : ¼

For male – Right hand

For female – Left hand

## **Procedure to see Naadi**

Site to feel Naadi and its procedure is well demonstrated by Agasthiar as follows

“கரிமுக னடியை வாழ்த்தி  
கைதனில் நாடி பார்க்கில்  
பெருவிரலங்குலத்தில்  
பிடித்தடி நடுவே தொட்டால்  
ஒருவிர லோடில் வாதம்  
உயிர்நடு விரலிற் பித்தம்  
திருவிரல் மூன்றி லோடில்  
சிலேத்தும் நாடிதானே”

- அகத்தியர் நாடி.

### **Suitable place for reading Naadi.**

According to Thirumoolar, feeling the Naadi in various sites are mentioned as,

தாது முறைகேள் தனித்தகுதிச் சந்தோடு

ஓதுறு காமிய முந்திரெடு மார்பு

காது நெடுமூக்கு கண்டம் கரம்புருவம்

போதுறுமுச்சி புகழ் பத்தும் பார்த்திடே

- திருமூலர் நாடிகள்

Even though naadi can be felt on the above mentioned peripheral arteries, commonly the radial artery at the wrist.

**Formation of Naadi:** is ideal for all people

**(Naadi) + (Vayu) = (Uyir thathu)**

Idakalai + Abanan = Vaatham

Pinkalai + Pranan = Pitham

Suzhumunai + Samanan = Kabham

The gait of the naadi is compared with the gait of reptiles and birds

Vaatha Naadi - Movements of Swan & Hen

Pitha Naadi - Movements of tortoise & Leech

Kabha Naadi - Movements of frog & snake

## **2. Sparisam ( palpation)**

The following criteria such as the temperature (Hot or cold) and changes in the skin (Smoothness, roughness, dryness, scaling, pigmentation, sweat, hard patches), swelling, tenderness, any abnormal growth, enlargement of viscera, ulcers, etc., are elicited by sparisam.

## **3. Naa (Tongue)**

The tongue has been regarded as an invaluable clinical indicatory of health and disease. The examination of tongue includes colour, coating, wetness or it's dryness, deviation, movements, fissures, ulceration, variation in taste, microglassia, macroglassia any abnormal growth etc.,

## **4. Niram (Colour)**

Reveals that any change in the colour of the skin, nails, hairs, conjunctiva, teeth, mucous membrane etc., cyanosis, pallor, yellowish discoloration of the body, redness of the skin are also noted.

## **5. Mozhi (Speech)**

In the examination of mozhi, the pitch of voice (low or high), loudness of voice, nature of voice, slurring speech, speech in hallucination, Aphasia should be noted.

## **6. Vizhi (Eye examination)**

Both sensory and motor disturbances are noted. By the examination of vizhi, redness, yellowishness, pallor, dryness, lacrimation, sharpness of vision, response of pupil, condition of hair in the eye lashes, inflammation, and ulceration of eye should be noted.

## **7. Malam (Motion examination)**

In the examination of malam, niram (colour) , nurai (froth) , erugal (solid), elagal (semisolid or liquid), quantity (increased or decreased) , smell and other examination like presence of blood, mucus, undigested matter in the stools can also be considered.

## **8. Moothiram ( Urine Examination )**

In the examination of urine, colour, odour, quantity, presence of froth, deposits, blood, pus, inorganic sediments, abnormal constituents such as sugar, protein etc., the frequency of micturations are to be noted.

The diagnostic value is usually arrived by methods of urine examinations called.

1. Neerkuri

2. Neikuri

### **Collection of urine:**

“அருந்துமா நிரதமும் அவிரோ தமதாய்  
அ.தல் அலர்தல் அகாலவூண் தவிர்ந்தழற்  
குற்றள வருந்தி உறங்கி வைகறை  
ஆடிக் கலசத் தாவியே காது பெய்  
தொரு முகூர்த் தக்கவைக் குட்படு நீரின்  
நிறக்குறி நெய்க்குறி நிருமித்தல் கடனே”

- தேரர் நீர்க்குறி நெய்க்குறி

Prior to the day of urine examination, the patient should be advised to take a balanced diet and should have good rest. The first voided urine of the patient is collected in a glass container. The colour volume, frothy, smell, specific gravity and sedimentation is noted. A drop of gingelly oil is added into the container without any disturbance and the tendency to spread is examined with in 1 ½ hrs.

#### **i) Neerkuri**

வந்த நீர் கரி எடை மணம் நுரை எஞ்சலென்  
றைந்திய லுளவவை யறைகுது முறையே

- தேரர் நீர்க்குறி நெய்க்குறி

In neerkuri Niram, Edai, Manam, Nurai and Enjal of the voided urine is noted. This has been already mentioned in Envagai thervugal

“அருப்ப முற்றார்க் கவ்விதி விலக்கே”

Though the urine should be examined only according to the rules and regulations at time of emergency, they can be relaxed.

**Niram** : It indicates the colour of urine voided.

**Edai** : It indicates the specific gravity of urine.  
(Increased or decreased quantity).

**Manam** : It indicates the smell of urine voided.

**Nurai** : It indicates the frothy nature of urine voided.

**Enjal** : It indicates the quantity of urine.

**Neikuri**

A drop of gingelly oil is dropped into a wide vessel containing the urine and is kept in sun light in a calm place without shaking and the dearrangement of three thathus is studied by nature of a oil spread on the surface of urine.

“அரவென நீண்டிடின அ.:தே வாதம்

ஆழிபோற் பரவின் அ.:தே பித்தம்

முத்தொத்து நிற்கின் மொழிவதின் கபமே”

- தேரர் நீக்குறி, நெய்குறி

Vaatham - The drop of oil lengthens like a snake.

Pitham - The drop of oil spreads like a ring.

Kabham - The drop of oil resembles a pearl.

Oil spreading like above indicates thontham.

The siddhars followed up this method for prognosis of the disease and classify the disease as curable and incurable.

Treatment in siddha medicine is aimed at keeping the three dhoshas in equilibrium and maintenance of seven thathus. So proper diet, medicine, an adjuant and a regimen of the life are advised for a healthy living and to restore equilibrium of doshas in increased or decreased condition.

In diseased condition, body shows many signs and symptoms. To diagnose the disease and choose the correct medicine the physician must have the knowledge of pathology of the disease, which is essential for proper treatment. For this purpose in this dissertation work, I have selected the disease “Mega thimiram” one among the 96 eye diseases.

## AIMS AND OBJECTIVES

The recent advancement in the field of medicine has opened a window in the field of siddha medicine to study in detail the basic concept of siddha pathology and redefined its application according to the present scenario.

“Mega thimiram”, a complication of diabetes is now considered to be important because of its pandemic spread. Nearly 177 million people i.e two thirds of population of developing countries are suffered from diabetes. The major populations of the diabetics are unaware of their diabetic status while the awarded persons do not realize the importance of consistent follow ups. Most of the physicians treating are not also trained to detect and refer sight threatening diabetic retinopathy for a timely treatment.

So, an effort is made to derive the basic concepts of **“Mega thimiram”** in a scientific way to the modern world for their view.

- ❖ The main aim of this study is to collect the ancient siddha literatures about mega disease in general and mega thimiram in particular.
- ❖ To study the clinical course of the disease with keen observation on aetiology, pathology, clinical features and diagnosis.

- ❖ To evaluate the Siddha basic physiology and pathology
- ❖ To make a note in order to analyse the clinical symptoms and pathology of “ Mega thimiram” and also about climate, sex, habitat, occupation etc.,
- ❖ To support my study using envagai thervugal, mentioned both in siddha literatures with modern parameters.
- ❖ To study the diagnostic methods and compare with modern investigations techniques like slit lamp, direct and indirect ophthalmoscopy with respect to mega thimiram.
- ❖ To discuss the complications of “ Mega thimiram”
- ❖ How to prevent and control early blindness.
- ❖ To have a plan for further studies and research on this disease.

## **INTRODUCTION ABOUT DISSERTATION TOPIC**

The author has selected the eye disease “**Mega thimiram**” for the present study. The topic of dissertation is taken from “**NAGAMUNI NAYANA VIDHI – 200**”

The word megam literally means clouds. As the cloud in the sky, denotes rain fall, the mega diseases in man also indicates pathology to so many diseases. The clouds fall as rain, the patient with the mega disease have increased frequent passage of urine.

The term megam popularly called as Neerizhivu is characterized by increased frequent passage of urine, having sweet odour. In our system of medicine it is one among 4448 diseases and it is separately dealt by Yugi in Yugi Vaidhya Sindhamani 800. The disease pramiyam or pramegam should not be confused with the megam, because megam is strictly a disease of metabolic disorder, since the excretory organ kidney has only a limited ways of responding to a multitude of pathogenic stimuli, urinary symptoms like frequent passage of urine is chiefly taken into consideration for the megam disease. Megam or Madhumegam, Yugi has given more importance to variation in colour, consistency and constituents of urine as the gradual diminution of the physical constituent saaram is mainly excreted are urine.

As for lay man, any discharge from the urethra, for example leucorrhoea, spermatorrhoea, purulent discharge etc, are called as

passing of megam in urine. This is a misnomer and the physician should carefully evaluate the exact disease.

Pramiyam or pramegam is of 21 types according to Agasthiyar Gunavagadam, which matches with Yugi's classification of pramiyam. Premegam usually comprises diseases of genito urinary tract which includes urinary tract infections, genital tract infections, renal diseases and sexually transmitted diseases etc..

Megam is correlated with that of "Diabetes" in modern medicine. Yugi classified it into 20 types, which are all deal with different types and complication of Mega Noi. So that here it is concluded that in 'Megathimiram' is a disease of eye due to complication of Mega Noi (Diabetes).

**Megam** represents Madhumegam caused by diminution of seven physical constituents.

**Thimiram** refers to an eye disease which is a blindness caused by the constriction of retinal blood vessels, retinal hemorrhage and exudates formation.

As the dissertation topic Mega thimiram is among 96 eye disease, let us have a study about the eye in detail.

## THE NORMAL EYE:

“வெள்ளையில் சிவப்பு றாது விளங்குநற் படிகம் போன்று  
ஒள்ளிய சோதி தன்னில் ஒளிநிற வண்ண மாகில்  
உள்ளொளி பொருந்த வங்கே உன்முகம் விளங்கத் தோன்றில்  
ஒள்ளிய நயன மாகும் உண்மையீ தறிந்தி டாயே”

- அகத்தியர் நயன விதி.

The conjunctiva, white of the eye occupying 5/6 of eyeball, is clear, white without redness like a crystal. The cornea, black of the eye occupying 1/6 of eyeball is black, opaque and resembles like a prism with good refracting power. 1/7 of the black portion is occupied by ‘Jothi’ or ‘Thaarai’ which constitute the pupil (Paavai).

## Dimensions of the eye:

“பங்கமில் விழியி னீளம் பகர்தரு மகலந் தன்னோ  
டிங்கத னாழ நீ தான் இயல்புட னுரைக்கக் கேளாய்  
அங்குல மிரண்டி னோடே யரையுமொன் றுன்ன லாகும்  
செங்கயல் விழியின் மாதேசெகத்துளோர்க் கறிந்து கொள்ளே”

- அகத்தியர் நயன விதி

According to Agasthiyar’s lines,

Length of the eye is 2 inches,

Breadth of the eye is ½ inch

Depth of the eye is 1 inch.

## History of eye diseases:

### கண்ணோய் வரலாறு

”கருதியதோர் கண்ணில்வந்த வியாதி கேளு  
காரணந்தான் சொல்லுகிறேன் கட்டாய் கேளு  
வெருதியென்ற மாதர்களையுற்றுப் பார்த்து  
வுடனேங்கி மோகமுற்று வுடற்பா வந்தான்  
சதிருடனே கருக்கண்டு வழித்த தாலுஞ்  
சக்திதோ டத்தாறும் தெய்வத்தானும்  
விருதுடனே பலவுயிரைக் கொல்லக் கண்டு  
விலக்காதே பார்திருந்த விறினாலே”

”வீறான பலபாவஞ் செய்கை யாறு  
மெய்ய தனைப் பொய்யென்ற விழம்பினாலும்  
வேறாகப் பிறக்கிடுக்கண் செய்த தாலும்  
மிக்கதொரு சிவாலயங்கள் விரும்பா தாலும்  
கூறான தெய்வத்தை யிகழ்ந்த தாலும்  
கூர் விழியால் நேர்விளங்குந் கலந்தா னப்பா  
வாறாகத் தொண்ணூற்றாறு வியாதி வரலாறு  
மதிகமாங் கன்மமென வறிந்து கொல்லே”.

- அகத்தியர் கன்ம காண்டம்

According to Agasthiyar kanma kandam, the eye diseases are caused due to

1. Sexual indulgence
2. Hereditary

3. Non-belief on almighty
4. Telling lies
5. Congenital
6. Due to evil deeds.

### **Aetiology for eye diseases.**

According to Agasthiyar Nayana Vidhi.

“கொர்ப்பத்திற் சிசுவாழ் போது கிருமிகள் சேர்ந்திட் டாலும்  
கப்பிய பசியுற் றாலுங் கலக்கங் கொள் திகில்நேர்ந் தாலும்  
செம்புமாங் கனிகாய் மெத்த தேடியே புசித்திட்டாலும்  
ஓப்புறு மகவின் கண்ணில் வியாதிவந் தணுகுந் தானே”

- ❖ Worm infestation during foetal growth
- ❖ Hunger
- ❖ Anxiety
- ❖ Excessive intake of sour tasted fruits by pregnant mother causes eye disease to the child.

### **According the Nagamani's version:**

Eye disease are also caused by

- ❖ Pox virus.
- ❖ Pitha diseases.
- ❖ Polluted water bathings.

According to Thiurmoolar textual works,

“பாரேய் பொடிசுடல் பருவெயின் மேற்படல்  
வாரேறு கொங்கையாள் மாயை மிகச்செயல்  
காரே முழுக்கறல் கண்ணா லனல்பார்த்தல்  
சிரேறு பாடாணம் தின்றதாற் கண்ணோயே”

“கண்ணோய் வருகிற காரண மின்னுங்கேள்  
பண்ணான **மேகத்தாற்** பருவெட்டை வாயுவால்  
தண்ணா மலக்கட்டால் தண்சலக் கட்டினால்  
புண்ணா மிரணத்திற் போடுங்கா ரத்தாலே”

“காரச் சுறுக்காற் கடுசத் தூமத்தால்  
நேரொத்த சார்நின்ற மூக்கின் வாசத்தால்  
பாரொத்த பேதியாற் பலபல தண்ணீரால்  
சீரொத்த கண்ணில் சிறக்கும் வியாதியே”

- திருமூலர்

The aetiological factors for eye diseases are,

- ❖ Barefooted walking on sunny weather.
- ❖ Excessive sexual indulgence.
- ❖ Common in welders & cobblers due to flame exposures.
- ❖ Intake of organic compounds.
- ❖ **Mega diseases like diabetes.**
- ❖ Genito urinary diseases like Gonorrhoea.

- ❖ Constipation.
- ❖ Oliguria.
- ❖ Application of mercurial preparation on wounds.
- ❖ Excessive or chronic intake of mercurial compounds and salts.
- ❖ Inhalation of mercurial smoke.
- ❖ Chronic diarrhoea.

According to

“உண் டிடு மசனந் தன்னீ லுகந்துகல் கடிக்கை யாலும்  
கொண்டகல் மயிரி னாலுங் கொடுமலச் சேர்க்கை யாலும்  
பண்டுவெற் றிலையும் பாக்கும் பக்கரை யடக்கை யாலும்  
கண்டநேத் திரந்த னக்குக் கருகிய நோய்க்குத் தாயாம்”

The eye diseases may also due to,

- ❖ Eating stone particles and hair mixed food.
- ❖ Chronic constipation.
- ❖ Betal chewing habituals.

### **Visual acuity regarding with age:**

According to

“தெளிவறு ஒழியா நிற்கும் தீங்கில்லை முப்பத்தைந்தில்  
ஒளியது புகைந்து சற்றே ஒதுங்கிடும் நாற்பத் தஞ்சில்  
வெளிபுறம் புகைந்து காட்டும் மேவிய ஐம்பத் தேழில்  
அழிவுற விருளுங் கண்டாய் ஆண்டது நூற தாமே”

- up to 35 years – vision normal
- after 35 to 45 years – there is variation in diopter of lens causing presbyopia.
- after 45 to 57 years – vision slightly diminished and immature cataract develops
- after 57 years – mature and hypemature cataract develops leading to blindness by 100<sup>th</sup> year.

**Administration of eye applicants according to Paruvakalangal.**

“மிக்கவ ரெழுது காலம் யாவுமா மிதுன நன்றோ  
 டொக்கவே துலாந்தேள் மாசம் காலையாம் உயர்வில் லோடு  
 தக்கம மகரம் சும்பம் மீனமத் தியானம் மற்ற  
 பக்கமா தங்கள் கண்ணில் பதினெட்டாம் அஞ்ச னங்கள்”

At the month of

- |                                |   |              |
|--------------------------------|---|--------------|
| Aani, Aipasi, Karthigai        | – | morning time |
| Margazhi, Thai, Maasi, Panguni | – | day time     |
| Chitirai, Vaigaasi, Aadi,      | } | within 18    |
| Aavani, Puratasi               |   |              |

( Note: Nazhigai = 24 minutes)

### **Time for External Treatment:**

“களவறு நரம்பு குத்தல் கருவிக ளாடல் காலை  
யளவறு கொம்பு வைத்துங் குதிரம்வாங் குதல்மத் தியானம்  
அளவறு அட்டை விட்டு ஆற்றவ தந்தி காலம்  
தளவறு நகைப்பால் வெய்யோர் புரஞ்செற்றார் சாற்றி னாரே”

Surgical procedures like

Narambu kuthal, Karuviadal - in morning time.

Kombu vaithal, Kurudhi vaangal - in afternoon.

Leech therapy - in evening time.

### **Contraindications for applying eye drops:**

“தனக்குமந் தாரத் தானும் தலையது முழுகி னாலும்  
வினக்குறு மாதர் மாதவிடையினால் வெளிநின் றாலும்  
மனக்குறு பற்றுத் தானும் மருந்துதான் இடுதல் தானும்  
கனக்குமே கண்ணில் நோவு காண்பிக்கும் செய்யா நாளே”

Eye medicines and therapy are best avoided

- ❖ During rainy or cloudy days
- ❖ After taking oil bath
- ❖ During menstrual times
- ❖ Stress and strain periods

## Hygienic measures to prevent eye diseases:

### 1. Anjanam Idal:

“நிலமிசை மாந்தர் நோய்கள் நீங்கிடத் திங்க ளாறில்  
சலமறச் சத்தி செய்யத் தக்கதாம் சதுர்மா தத்தில்  
மலமறப் பேதி செய்ய மாத மொன் றினிலே நசியம்  
பலமுற மூன்றா நாள் அஞ்சனமிடப் பகர்ந்த தாமால்”

From the above lines for good health,

Vomiting done for 6 months once

Purgation for 4 months once

Nasal drops for 45 days once

to bring the mukkutram to normal.

The eye applications known as ‘Anjanam’ done once for 3 days

to improve visual power.

### 2. Brushing habits:

“சீர்பெறு நயனந் தன்னில் சேர்ந்த நோய் வாரா வண்ணம்  
கார்செறி குழலினாளே கருதிடு தந்த சுத்தி  
நீர்திகழ் ஆல் எருக்கு நிறைவேலம் மருது பூலா  
சேரிடப் பக்க முற்றி தேய்த்திட வலத்தில் பின்னை”

To prevent eye diseases use the sticks of

Ficus, Calotrophis, Arjuna and Poola for brushing.

### 3. Dietary habits:

“திண்ணார் பண்ணை சிறுகீரை மறந்தார் தன்னை சீர்கேடாய்  
பொன்னாங் காணிக் கறிகூட்டார் பூசார் பாதம் நெய்யுண்ணார்  
பண்ணார் மதியந் தனைப்பாரார் பால்வார்த் துண்ணார் - பத்தேயார்  
கண்ணார் நோயாற் கவல்வரதை யாமும் சொல்லக் கடவோமே”

- ❖ Regular intake of spinach varieties
- ❖ Intake of milk products like ghee, milk atleast twice a day.
- ❖ Brush regularly
- ❖ Avoid day time sleeping.

### EXERCISES:

#### 4. Amirtha Yogam:

”உண்டுகை கழுவிப் பின்னை உறுமைய மூன்று துள்ளி  
வண்டணி குழலாள் வார்த்து வளமிகும் நிமையைத் தேய்த்துக்  
கொண்டொரு கடிகை நேரம் குணமிகும் கதிரைப் பார்த்து  
பண்டுபோ லிருக்கும் போது பிரிவுகள் அமிர்த யோகம்”

Drop few drops of pure water into the eye, and gently massage  
the eye and watch moon for one kadigai ( 22 minutes)

#### 5. Nilavai Paarthal:

“கைவிரல் தன்னைக் கொண்டு கலந்துபல கணிபோல் விட்டு  
துய்யசந் திரனை மெள்ள தெளியவே நோக்கிப் பாடும்  
வெய்யொளி யுண்டு நீயும் விரவிய கண்ணில் நீரைத்  
துய்யமாய் விட்ட லம்பித் துவளாகப் பிசைந்தி டாயே”

Arrange the fingers like palakani method and see the moon for few minutes. Then wash with pure water and gently massage. it will improves visual acuity.

## 6. Ghee Therapy:

“கண்ணது பலகால் நொந்து கடுகியே வழன்று வந்தால்  
தண்ணிய உள்ளங் காலில் நறுநெய்யை மிகவும் தேய்த்துத்  
திண்ணிய தவிடு மரவால் சிறக்கவே தூவி வைத்து  
தண்ணெனக் கழுவி நல்ல சந்தனம் பூசத் தீரும்”

If there is any redness or inflammation to eye, apply ghee in the sole of foot, apply husk over it, and keep it all night, then wash it with water and apply paste of sandal.

## Kan- noigal – 96

In our siddha medical system compiled by Siddhars, eye diseases due to various aetiological factors are divided into 96 types, according to four regions of eye.

According to Agasthiyar Nayana Vidhi, Kan noigal are classified into 96 types

“அக்கிர ரோகம் அவிகாய விரணம்  
உக்கிர ரோகம் உடைந்தெழுந் திடுதல்  
சாய்கண் குருடு தடிப்புத் தினவு  
தூய வெண்குருடு சுக்கிர ரோகம்  
மாலை காசம் மருவுகண் சிவப்பு  
நீலகாசம் நெறியொளி மழுங்குதல்

அருவிநீர் தும்மல் அடைந்தெழுந் திடுதல்  
 பருமுளை யெழுச்சி படர்வெள் ளெழுத்து  
 சோதியல் விரணம் தூர்மாமிச வளர்ச்சி  
 கோதிலா விழியில் குருதி சீழ் பிடித்தல்  
 நிமை முழி மாமிசம் நெருக்கிப் பிடித்தல்  
 அழிகண் புழுவெட்டர்ந்தெழுந் திடுதல்  
 நாகபடலம் நன்முழி விழுங்கி  
 மேக வெட்டையால் மேவிடு மந்தம்  
 முழிகண் குருடு முன்னிமைக் குத்து  
 வாத காசம் மணிகாசம் கண்குருடு  
 உருவிழி புடைத்து உயர்ந்தெழு காளான்  
 பரவைப் பூவோடு பஞ்சநீர்ப் படலம்  
 அமரம் புகைச்சல் அதிகமந் தாரம்  
**திமிரம்** சேர்நெறி செவ்வேர் முடமயிர்  
 அந்திர காசம் அழற்றின கண்ணோய்  
 சந்திர ரோகம் தலையெழு நாயிறு  
 கூசி விழித்தல் குவளை நெறித்தல்  
 காச மிருட்சி கண்விர ணப்பூ  
 துண்ணு காசம் சுழல் விழி யெரித்தல்  
 அன்னகோபம் அழற்றிய மாலை  
 கண்பக்கப் படலம் கற்பமா ரோகம்  
 அக்கரம் பில்லம் அளித்திடும் பிரித்தல்  
 பித்த காசம் பிறவிக் குருடு  
 துந்திடுங் காளான் துண்ணுவெண் புகைச்சல்

கண்ணி லெழுச்சி கண்குவளை நெரித்தல்  
 விரண சுக்கிரன் வெண்ணோக் காடு  
 சூழ்ந்திடும் பில்லம் சேராக் கண்துடிப்பு  
 வருஞ்சல ரோகம் மயிர்புழு வெட்டு  
 விதன மந்தாரம் வீங்குதல் விழியனல்  
 மதன மந்தாரம் வளர்ந்தெழு ரோகம்  
 சுடர்பல தோன்றல் சுடரதி மாமிசம்  
 உயர்ந்த கண் புடைத்தல் உவரெழு காசம்  
 வால காசம் மருவிழி காசம்  
 ஒரு நீர்ப் பில்லம் ஒரு நீர்ப் பாய்ச்சல்  
 குவளை விப்புருதி குன்றிமைத் தடிப்பு  
 குவளை காசம் கொடும்புழு வெட்டு  
 மந்தார காசம் வாலையிற் காசம்  
 அந்திர விரணம் இமையோ டுறுத்தல்  
 நத்தைப் படுவன் நற்குவ ளையோடு  
 புத்து எழுந்திடும் பொங்கிய விதனம்  
 எண்ணிய வியாதிகள் தொண்ணூற் றாறும்  
 கண்ணினில் வினையெனக் கருத லாமே”

Nagamuni also clearly classified kan-noigal 96 based on four regions of the eye

“கருவிழி தன்னில் நோய்கள் கலந்திடும் நாற்பத்தைந்தும்  
 மருவிய வெள்ளை தன்னில் வந்திடும் மிருபதென்க  
 பெருகவே யிமையில் தோடம் பேர் பதினாறு  
 பருவமாங் கடையிரண்டில் பதினைந்து தோடமாகும்”

I. Diseases of Black portion of the eye - 45

(including Cornea, Choroids, Iris, Retina,

Pupil, Lens and Vitreous humour)

They are

Kasam	-	8
Padalam	-	7
Kumudam	-	3
Vizhiundal	-	3
Kundkam	-	3
Thimiram	-	7
Vari	-	3
Sukiran	-	5
Nerisal	-	3
Poo	-	3
		<hr/>
		45
		<hr/>

Diseases of white portion of eye - 20

(including sclera)

They are

Ezhuchi	-	5
Padarthi	-	3
Nerisal	-	3
Putru	-	3
Kumulam	-	3
Vari	-	3
		<hr/>
		20
		<hr/>

Diseases of the eye lids	-	16
Pillam	-	3
Imai thadippu	-	1
Mudamayir	-	1
Ilichakan	-	1
Parparogam	-	3
Kazhalai	-	3
Imaineer Paichal	-	1
Sutrukulaivu	-	1
Puzhukadi	-	1
Imaiyunarchi	-	1
		<hr/>
		16
		<hr/>
Diseases of corner of the eye (Angles)	-	15
Kannokaadu	-	1
Poochandiram	-	1
Neerpadartha	-	1
Vizhivatham	-	1
Viranaparu	-	1
Vipurudhi	-	1
Rathapadartha	-	1
Thasaipadartha	-	1

Neerkulai	-	1
Rathakulai	-	1
Mangisakulai	-	1
Imai kurudu	-	1
Imai Kumizhl	-	1
Naethiravayu	-	1
Kannoi	-	1
		<hr/>
		15
		<hr/>

The author dissertation topic Mega thimiram falls under diseases of the black portion of the eye under thimiram.

Thimiram is of seven types, according to Nagamuni's

“மின்னனாய் திமிர தோஷக் குணத்தினை விளம்பக் கேளாய்  
வன்விழி மயக்க மாகும் மற்றவெள் ளெழுத்தி னோடு  
பின்மந்தா ரத்தின் மூளை வறட்சிசெய் பித்த சேற்பம்  
மன்னுநீர் வாயு மேக மேழ் சாத்திய மூன்று மாமே”

They are

1. Velleluthu thimiram
2. Maalaikann thimiram
3. Mandhara thimiram
4. Varatchi thimiram
5. Neer thimiram
6. Vayu thimiram
7. Mega thimiram

The first three types are incurable,

while other ones are curable.

Agasthiar mentioned about the features of thimiram as follows,

“மறக்குங் கடுக்கும் கரகரக்கும் மாறா வாதை தான் பெருக்கும்  
உறக்குத் தலைமுகந் தந்திருக்கும் ஊறும் நீரும் பீளையிடும்  
பறக்கும் விழியும் வெளுத்துவரும் பார்வை குணமும் பலவாகும்  
திறக்கு நயன குணந்தானே திமிரம் வகையின் செயல் தானே”

- அகத்தியர் நயன விதி

- ❖ Burning pain & Irritating pain on eyes
- ❖ Sleepiness, Itching on face and head
- ❖ Excessive lacrimation
- ❖ Pallor of eyes.

Mega thimiram according to Nagamuni Nayana Vidhi 200, has following features,

“ஆக்கையிற் றாதுகெட்டு அடர்நரம் புகள்மெ லிந்து  
நோக்கிடும் விழியுஞ்சுற்றி நொய்மைசே ரொளிமழுங்கி  
வீங்கிடும் கனல்மிகுந்து விழியினி லெரிவுங் காணில்  
தேக்கியல் மொழியாய் மேகத் திமிரமீ தென்று செப்பே”

- நாகமுனி நயனவிதி 200

- ❖ Gradual diminution of 7 Udal Thathukkal
- ❖ Growing dullness of vision
- ❖ Inflammatory signs like heat and burning sensation of the eye and atrophy of retinal vessels and optic nerve

## READING LINES BETWEEN NAGAMUNI'S POEM

### “மேகத்திமிரம்”

“ஆக்கையிற் றாதுகெட்டு அடர்நரம்புகள் மெலிந்து  
நோக்கிடும் விழியுஞ்சுற்றி நொய்மைசே ரொளிமழுங்கி  
வீங்கிடும் கனல்மிகுந்து விழியினி லெரிவுங்காணில்  
தேக்கியல் மொழியாய் மேகத் திமிரம் தென்று செப்பே”.

- நாகமுனி நயன விதி - 200

The author has taken the dissertation topic “Mega thimiram” from the literary work “**NAGAMUNI NAYANA VIDHI - 200**”

According to text work, Nagamuni has given a very excellent and perfect title as Mega thimiram. The title is more specific as it results as a complication followed by Mega noi.

### “Megam”

Megam popularly known as “Neerizhivu” in those days is characterized by increased frequent passage of urine, having sweet odour. It is considered to be a single disease among the 4448 diseases.

### “Thimiram”

Thimiram, one among the eye disease of karuvizhi is caused by the atrophy of optic nerve, retinal vessel, degeneration in the retinal Rods & Cones etc.

## **“Mega Thimiram”**

The title refers to retinal complication of the eye due to Mega Noi

**”ஆக்கையிற் றாது கெட்டு”**

The line refers about the gradual diminution of 7 udal thathukkal (Physical constituents) namely Saaram, Seneer, Oon, Kozhuppu, Enbu, Moolai and Sukkilam followed by Mega Noi.

**”அடர் நரம்புகள் மெலிந்து”**

There exists gradual vascular constriction of arteries, atrophy of optic nerves and retinal vessels.

**”நோக்கிடும் விழியுஞ்சுற்றி நொய்மைசே ரொளிமழுங்கி”**

There is gradual and progressive growing dullness of vision.

**”வீங்கிடும் கனல் மிகுந்து விழியினி லெரிவுங்காணில்”**

When there is an inflammation, there is naturally local edema, heat followed by burning sensation of the eye.

**”தேக்கியல் மொழியாய் மேகத் திமிரம் தென்று செப்பே”**

Above all are the characteristic findings of Mega thimiram.

Mega thimiram is one among the Karuvizhi noi. The clinical feature of Mega thimiram can be summarized as follows .

- ❖ Gradual diminution of 7 Udal Thathukkal,
- ❖ Growing dullness of vision,
- ❖ Inflammatory signs like edema, heat and burning sensation of eye,
- ❖ Atrophy of optic nerve and retinal vessels.

## **DETAILED PATHOLOGICAL VIEW OF DISSERTATION TOPIC**

### **MEGA THIMIRAM**

#### **MEGAM:**

‘Megam’ is characterized by metabolic disorder and it is a long term complication involving eyes, kidney, nerves and blood vessels which shows some abnormal changes in urine excretion i.e. excessive urination with increased amount of nutrients which is most essential to body function.

Glucose is the major source of energy reserve to the body which provides energy to brain, kidney and other organs. In diabetes, blockage of insulin action stimulates glucagon release, activates glycogen breakdown and impair insulin action in target tissues, so that hepatic glucose production is increased and capacity to dispose excessive glucose is also impaired, leading to severe hyperglycemia and impaired utilization of glucose, which may cause many complications.

#### **THIMIRAM:**

The word ‘Thimiram’ refers to disease which comes in view of cornea, but the problem is not in cornea which goes inside deep to the lens, and it may lead to visual disturbances which are discussed under the heading of thimiram. Thimiram refers to diseases of posterior segment of the eye i.e. Retina, Rods and Cones, Optic nerve, Choroid and Vitreous humour.

## **”ஆக்கையிற் தாது கெட்டு”**

In body, normal glucose homeostasis is tightly regulated by three inter related processes.

- ❖ Glucose production in liver,
- ❖ Uptake and utilization of glucose by peripheral tissue (mostly muscles) and
- ❖ Insulin secretions.

Insulin is necessary for

- ❖ Transmembrane transport of glucose and amino acids.
- ❖ Glycogen formation in liver and skeletal muscle
- ❖ Conversion of glucose to triglycerides
- ❖ Nucleic acid and protein synthesis

### **Pathological changes in 7 physical constituents.**

#### **Lymph, interstitial fluids:**

Obligatory water loss combined with the hyperosmolarity resulting from the increased levels of glucose in the blood tends to deplete intra cellular water, as for example in osmoreceptor of the thirst centres of brain.

#### **Blood:**

The blood glucose level is usually high. In diabetic atherosclerotic lesions appears earlier than in the general people. The cause for accelerated atherosclerotic process is not known but

possible contributory factors are hyperlipidemia, increased HDL, nonenzymatic glycosylation, and increased platelet adhesiveness. Microangiopathy of diabetes is characterized by basement membrane thickening of small blood vessels and capillaries of different organs and tissues such as skin, skeletal muscle, eyes and kidney.

Insulin deficiency causes excessive break down of adipose stores resulting in increased level of free fatty acids. Oxidations of these fatty acids produce ketone bodies, resulting in metabolic ketoacidosis leading to diabetic coma.

**Muscle:**

Atrophy and weakness of large muscles in the upper leg and pelvic girdle resembles primary muscle disease.

**Fat:**

Insulin deficiency leads to decreased triglyceride synthesis, fatty acid synthesis, Lipoprotein, lipase activity and adipose tissues. It increases lipolysis, ketogenesis, and fatty acid oxidation in liver.

**Bone:**

Chronic diabetes leads to uraemia. In chronic uraemia, there is osteodemyelination and demineralization of bones.

**CNS:**

Peripheral nerves, brain and spinal cord all may be damaged in long standing diabetes.

**Sexual function in male / female:**

Peripheral neuropathy is sometime accompanied by disturbance in neural innervation of pelvic organ. Autonomic neuropathy may lead to sexual impotence and retrograde ejaculation in addition.

***”அடர் நரம்புகள் மெலிந்து”***

A number of systemic complications may develop after 15-20 years after onset of diabetes. The early glycosylation products of collagen and other lived proteins in interstitial tissues and blood vessel walls rather than dissociating, undergo a slow series of chemical rearrangements to form irreversible Advanced Glycosylation End Products which accumulate over life time on vessel wall. In large vessels, they deposit as trapping low density lipoprotein (LDL) for example, retards its efflux from vessel wall and enhances the deposition of cholesterol in the intima thus accelerating atherosclerosis. Microangiopathy of diabetes is characterized by basement membrane thickening of small blood vessels and capillaries of different organs and tissues such as skin, skeletal muscle, eyes and kidney.

***”நோக்கிடும் விழியை சுற்றி நொய்மை சேரொளி மழுங்கி”***

Hyperglycemia increases retinal blood flow and metabolism having direct effects on retinal endothelial cells and pericytes, loss of which impairs vascular autoregulation. The resulting

uncontrolled blood flow increases production of vasoactive substance and endothelial cell proliferation resulting in capillary closure. This causes chronic retinal hypoxia and stimulates production of growth Factor (VEGF). VEGF acts via protein kinase C to stimulate endothelial cell growth (causing new vessel formation) and increased vascular permeability (causing exudative damage). The hard exudates and edema of fovea are the most common causes of visual impairment in diabetic patients.

***”வீங்கிடும் கனல்மிசுந்து விழியினி லெரிவுங்காணில”***

Involvement of the fovea by edema and hard exudates or ischemia (diabetic maculopathy) is the most common cause of visual impairment.

As it is a chronic inflammatory disease there is naturally heat followed by burning sensation of the eye. It is due to interruption of axoplasmic transport with subsequent build-up of transported within the axons (axoplasmic stasis) in the nerve fiber layer.

## MEGAM

### Synonyms of Madhumegam

Neerizhivu, Vegumoothiram, Madhu prameham, Inippuneer, Meganeer, Thithippuneer.

### Definition (Iyal)

Frequent passage of increasing urination more than the normal, resulting in deterioration and gradual diminution of seven thathus.

“இனிப்பான இனிப்பல்ல ஈ வந்தாடும்  
ஒரு துளிவாய் விட்டார்கைப் பிணியாய் தோன்றும்”

- குரு நாடி

### Noi Varum Vali (Etiology)

a. The authentic etiological factors described by various siddhars are as follows.

“கோதையர் கலவி போதை கொழுத்தமீ னிறைச்சி போதைப்  
பாதுவாய் நெய்யும் பாலும் பரிவுட னுண்பீ ராகில்  
சோதபாண் டுருவ மிக்க சுக்கில பிரமே கந்தான்  
ஓதுநீ ரிழிவு சேர வுண்டென வறிந்து கொள்ளே”.

- அகத்தியர் 1200

“உற்பவிக்கும் பால் நெய்யால் இறைச்சி கொள்ளல்  
வரிசையாய் மீன்தன்னால் அருவிருத்த  
மற்பவிக்கும் பதார்த்தத்தால் மதுர வஸ்தால்  
மந்தங்கள் தனைபுசித்தல் வேகாப் பண்டங்

குற்பவிக்குங் குளுத்த வன்ன மங்கை கோஷ்டி  
குறித்த நித்திரை தவிர்தல் அக்கினி மந்தம்  
தற்பவிக்குந் சரீரந்தான் மிகப் பருத்தற்  
சஞ்சலந்தான் மிகப்பயத்தால் தரிக்கும் நோயே”

- யுகிவைத்திய சிந்தாமணி

”சரியாக மேகத்தா லபானவாயு

தான்புகைக்கு மேலேறிக் கபாலச் சூடாம்

பெரிதான மேகத்தா லத்தி வெந்து

போமப்பா தசைவெந்து ரத்தம் வற்றிப்

பரிவாகித் தசவாய்வால் மந்தங் கொண்டு

பெருந்தீனி மலபந்தம் உதான வாயு

வரிவாகித் தேகமெலாம் விடநீ ராலே

மெய்யழிந்த மேகமென்ற திருப தாச்சே”

- சித்த மருத்துவம்

Yugimuni in his text attributes this disease is due to injudicious diet containing rich fat, sweet and also obesity, too much of sedentary habits without exercise also leads to madhumegam. Undue fear, severe depression has also emphasized for the development of madhumegam.

### **Hereditary Factors**

Statistics indicate that those with family history of diabetes have higher (25% - 35%) risk than those without such background. A number of genetic markers are now recognized.

Agasthiyar here tells that megam occurs due to ones kanma vinai and to his ill habitual deeds. These produce imbalanced vaatha, pitha, kabhaneer which in turn produce 20 types of mega disease.

”ஆமப்பா மனிதர் செய்தகன்மத்தாலே  
அரகரா மேகமென்ற ராசாவாலே  
காமப்பால் வீததைதாற் யோசிப்பினாலும்  
கைக்கடங்கா நோய்கள் வருங் கன்மத்தாலே  
போமப்பா மேகம் வந்த காரணத்தான்

புகலுவேனூயிர் வதைகள் செய்வதனாலப்பா  
நாமப்பா கண்டபடி சொற்றோய் கேளு  
நலமான வாதசலம்பித்த சலமாமே  
செலமாற சிலேத்துமந்தான் சலமுன்றினாலே  
சோந்து கொண்டு இருபதென்ற சமலமதாச்சு”

- அகத்தியர் கன்மகாண்டம் 300

“உற்றிடும் உலகத்தோர்க்கு உறுபல வியாதியெல்லாம்  
பற்றிடும் குணங்கள் தன்னை பகர்ந்துரை செய்ய வேண்டில்  
ஒத்திடும் சன்னவாறும் உடலுயிருனவாறும்  
அத்திமா மலையில் வாழும் மாமுனி வகுத்ததாமே”

- அகத்தியர் குருநாடி சாஸ்திரம்

Thirumoolar says in his Thirumandhiram about mega rogam.

“பேர் இளமை இன்பம் பிணி மூப்பு சாக்காடு  
ஆறும் கருவில் அமைந்தபடி  
முறைகேட்கில் ஒன்பது முயற்சியால் வந்தது  
துறை கேட்கிற கருப்பத்திற் றுவங்கிய மேகங்கள்  
நிறை பூத்தகொங்கையாள் நாயகன் மோகத்தால்  
மறை போற்றுங் கருப்பத்தில் வளர்ந்தது மேகமே”

- திருமூலர்

### **Sexual Indulgence**

- 1) “ஸ்திரிபோகம் செய்ததினால் வேவுகொண்டு  
சிரசு மட்டும் வெந்துருகிக் கனலே மீறிக்  
குறியுடனே மேகந்தான் கொடுமை செய்து  
குறைந்து வரும் தாதுவெல்லாம் குன்றிப் போகும்”

- குருநாடி

- 2) “கன்னி மயக்கத்தால் கண்டிடு மேகமே”

- நாடிநூல்

- 3) “கிரந்தி புண்ணிரன மேககீசகனெனுந் துன்மார்க்கன்  
அருந்ததி என்னும் பாஞ்சாலி யன்னையைக் கண்ணுற்றானே”

- தேரன் மருத்துவ பாரதம்

The direct inference from the above poem is that all Siddhars attribute Diabetes mainly due to excessive indulgence in sex which results in depletion of total strength of body as a whole, making the individual susceptible to this disease.

## Noi Enn (Classification)

Twenty varieties of mega disorders have been discussed by Yugimuni, Agasthiar and by Theraiyar.

The disease mega has twenty types.

“வசனித்த மேகமது இரண்டுபத்து  
வாதத்திற் பிறந்த சலம் நாலேயாகும்  
பிசனித்த பித்தத்தி லுற்பவித்த  
பேரான சலந்தானு மாறுமாகும்  
தேசனிந்த சேட்டு மத்தில் உற்பவித்த  
சீரான சலந்தானும் பத்தேயாகும்  
இசனிந்த இதனுடைய குணா குணங்கள்  
எழிலான உற்பத்தியியம்பக் கேளே”.

- யுகிவைத்திய சிந்தாமணி

The author Yugimuni classified mega disorder into 20 types .

Among this Vatha 4 , Pitha 6 and Kabha 10 types

“கழியும் வாதம் நான்காலும் கயம் பித்தமாறாலும்  
கழியும் சேத்துமம் பத்தாலும், சொல்லும் நாலஞ்சாய் தோன்றும்  
வழியும் வாதம் நான்காமே மாரு தவிழ்தந் தன்னாலே”

- தேரையர் வாகடம்

In Siddha literatures like Thirumoolar Vaidyam 600, Prameham is also called as Premeham Neerizhivu. The author who have dealt mega disorders have classified it under the three dhoshas and have given names according to his concept.

## **MATERIALS AND METHODS**

The study on the Noi nadal aspects i.e pathological view of **“Mega thimiram”** was carried out in the Aravinth eye hospital, Tirunelveli both at outpatient department and Inpatient ward

### **Selection of cases**

For the clinical study 30 cases suffering from Mega thimiram having signs and symptoms as said in the Nagamuni Nayana Vidhi- 200 are selected. Out of 30 cases 20 are selected for this dissertation under the guidance of professor and lecturers of Noi-Nadal Department, Chief Medical Officer, Fellows and postgraduates of Aravinth eye hospital, Tirunelveli.

### **Evaluation of clinical parameters:**

The cases were subjected to careful scrutiny, which involved history taking and examination of clinical features.

A detailed history was taken from the patients

- ❖ Family history
- ❖ Personal history
- ❖ Occupational history
- ❖ Diet habits
- ❖ Seasonal variations were noted.

All the clinical signs and symptoms of Mega thimiram and it's diagnosis is done by assessing the following criteria.

### **Siddha Aspect**

1. Mukkutra nilai
2. Udal kattugal
3. Envagai thervugal
4. kaalam
5. Nilam
6. Neerkuri
7. Neikuri

### **Modern aspect:**

#### **Lab studies**

#### **Haematological investigations**

1. Total WBC
2. Differential count
3. Erythrocyte sedimentation rate
4. Haemoglobin concentration
5. Blood sugar
6. Blood urea
7. Serum creatinine level

#### **Urine Analysis**

1. Albumin
2. Sugar
3. Deposits

## **Eye Examination**

1. Vision - Snellen's chart
2. Ocular pressure
3. Refraction
4. Colour vision
5. Fundus Examination
  - a. Slit lamp with 90D
  - b. Direct Ophthalmoscopy
  - c. Indirect Ophthalmoscopy

## **Special investigations:**

1. Fundus fluorescein angiography
2. Optical coherent tomography

## **OBSERVATION AND RESULTS**

Results were observed with respect to the following criteria

1. Age distribution
2. Sex reference
3. Kaalam
4. Seasonal variations
5. Thina reference
6. Dietary changes
7. Socio –economic status
8. Onset of the disease
9. Mukkutram
10. Udal kattugal
11. Envagai thervugal
12. Neerkuri, Neikuri reference
13. Signs and symptoms

### 1. Age distribution

Sl.No	Age	No.of.Cases
1.	upto 25	-
2.	26 – 50	5
3.	51 – 75	15
4.	76 above	-

### 2. Sex distribution

Sl.No	Sex	No.of Cases
1.	Male	13
2.	Female	7

### 3. Kaalam

Sl.No	Kaalam	No. of cases
1.	Vaatha kaalam	-
2.	Pitha kaalam	19
3.	Kabha kaalam	1

Most of the cases for this study belongs to pitha kaalam

#### 4. Seasonal variations

<b>Sl.No</b>	<b>Paruvakaalam</b>	<b>No.of. cases</b>
1.	Kaar kaalam	3
2.	Koothir kaalam	3
3.	Munpani kaalam	4
4.	Pinpani kaalam	3
5.	Ezhavenil kaalam	3
6.	Muthuvenil kaalam	4

#### 5. Thinai reference

<b>Sl.No</b>	<b>Thinai</b>	<b>No.of.cases</b>
1.	Kurinji	-
2.	Mullai	2
3.	Maruthuvam	15
4.	Neithal	3
5.	Paalai	-

#### 6. Dietary changes

<b>Sl.No</b>	<b>Dietary habits</b>	<b>No.of.cases</b>
1.	Vegetarian	4
2.	Mixed diet	16

## 7. Socio - economic status

Sl.No	Socio - economic status	no.of.cases
1.	Poor	8
2.	Middle class	8
3.	Upper class	4

## 8. Onset of disease

Sl.No	Onset of disease	No.of.cases
1.	Acute	-
2.	Subacute	-
3.	Chronic	20

## 9. Mukkuttram

The derangement undergone by the various types of vaatham, pitham and kabham

### a) Vaatham:

Sl.No	Vaatha types	No.of cases
1.	Pranan	-
2.	Abanan	20
3.	Viyanan	20
4.	Uthanan	20
5.	Samanan	20
6.	Nagan	-
7.	Koorman	20
8.	Kirugaran	12
9.	Devathathan	
10.	Danajayan	-

**b) Pitham:**

<b>Sl.No</b>	<b>Pitha types</b>	<b>No.of cases</b>
1.	Anar pitham	-
2.	Ranjaga pitham	5
3.	Prasaka pitham	10
4.	Aalosaga pitham	20
5.	Sathaga pitham	20

**c) Kabham:**

<b>Sl.No</b>	<b>Kabha types</b>	<b>No.of cases</b>
1.	Avalampagam	20
2.	Kilethagam	-
3.	Pothagam	-
4.	Tharpagam	5
5.	Santhigam.	20

**10. Udal Kattugal :**

<b>S.No</b>	<b>Udal Kattugal</b>	<b>No of cases</b>
1.	Saaram	20
2.	Senneer	20
3.	Oon	20
4.	Kozhuppu	20
5.	Enbu	20
6.	Moolai	20
7.	Sukkilam / Suronitham	20

## 12. Neikuri Reference

<b>Sl.No</b>	<b>Types</b>	<b>Character of urine</b>	<b>No.of.cases</b>
1.	Vatha neer	Lengthens like a snake	2
2.	Pitha neer	spreads like a ring	15
3.	Kaba neer	Resembles a pearl	3

## 13. Signs and Symptoms

<b>Sl.No</b>	<b>Signs and symptoms</b>	<b>No.of cases</b>
1.	Visual impairment	20
2.	Burning sensation of eye	5
3.	Microaneurysm	20
4.	Haemorrhage	4
5.	Exudates	12
6.	New vessels	5

## **ANATOMY AND PHYSIOLOGY OF RETINA**

Retina, the innermost tunic layer of the eyeball is a thin delicate and transparent membrane. Most highly developed tissue of the eye i.e., photosensitive layer.

Retina extends from optic disc to ora serrata and has surface area of about 256mm<sup>2</sup>. Retina is situated between hyloid membrane and vitreous body interiorly and choroid externally.

### **Dimensions**

Thickness of posterior pole  $\varnothing$  is 0.56mm

At equator  $\varnothing$  is 0.18 – 0.2 mm

At ora serrata  $\varnothing$  is 0.1mm

### **Colour**

Purplish red in colour (due to visual purple of rods)

After death, it appears white opaque

On ophthalmoscopic examination, it can be divided into three distinct regions.

- I. Optic Disc
- II. Macula lutea
- III. Peripheral Retina

### **I. Optic disc**

It is a well defined circular area of about 1.5mm diameter

**Colour:** Uniformly pink

All retinal layers terminates except nerve fibres which pass through lamina cribrosa to run into optic nerve. It is insensitivity to light and it is known as blind spot.

## **II. Macula lutea**

It is an yellow spot which is situated at the posterior pole of eyeball, temporal to optic disc.

The depression situated centrally is called fovea centralis. It is a transparent membrane. Optic disc is 3mm medial to macula lutea. It is concerned with photopic vision and colour vision. It corresponds to 15° of visual field.

Diameter : 1.85 mm

Thickness : 0.25 mm

Fovea centralis : It has three parts

Foveola : (0.35mm) forms central floor of fovea, situated 2 disc diameter from temporal edge.

Umbo : a tiny depression in centre corresponds to ophthalmoscopically visible foveolar reflex. Loss of this is an early sign of damage.

Foveal avascular zone : Located inside the fovea but outside foveola with varying diameter.

Surrounding the fovea are parafoveal and perifoveal areas about 0.5mm and 1.5mm in diameter, respectively.

### **III. Peripheral retina**

Peripheral retina can be divided into four regions

- Near Periphery : It refers to a circumscribed region of about 1.5mm around area centralis.
- Mid periphery : Occupies a 3mm wide zone around near periphery
- Far periphery : Extends from optic disc, 9-10 mm on temporal side and 16mm on nasal side.
- Ora serrata : Seratted peripheral margin where the retinal ends and ciliary body starts. It contains tooth-like extensions, to which vitreous and retinal pigment epithelium attached.

### **Microscopic structure of the retina**

Retina consists of three types of cells and their synapses arranged are in the following layers.

#### **1. Retinal pigment epithelium (RPE)**

Outermost hexagonal shaped cell layer containing pigment cells with fine mottling due to unequal pigmentation of cells. The potential space between retinal pigment epithelium and sensory retina is called subretinal space. Separation of RPE from sensory retina is called retinal detachment.

## **Functions of RPE**

1. Plays important role in photoreceptor renewal regarding with vit -A.
2. Forms outer blood-retinal barrier, actively pumping ions and water out of this space.
3. Phagocytic action.
4. Provide mechanical support to process photoreceptors.
5. RPE is involved with transport of nutrients and metabolites.

## **2. Layers of rods and cones :(Neuro epithelium)**

There are about 120 million rod and 6.5 million cone cells which transform light energy to visual impulse. Rods are absent mainly in fovea and maximum in optic disc.

## **3. External limiting membrane**

It is fenestrating membrane formed by junctions between cell membrane and muller's cells. It extends from ora serrata to optic disc.

## **4. Outer nuclear layer**

Formed by nuclei of rods and cones

The number of nuclei and thickness varies from region to region as follows.

Nasal to the disc - 8 to 9 layers of nuclei & 45  $\mu$ m thickness

Temporal to the disc - 4 rows of nuclei & 22  $\mu$ m thickness

- Foveal region - 10 rows of nuclei & 50  $\mu\text{m}$  thickness
- Rest of retina except  
 ora serrata - one row of cone nuclei and 4 rows of  
 rod nuclei with a thickness of 27  $\mu\text{m}$ .

### **5. Outer plexiform layer**

Contains synapses between rod spherules and cone pedicles with dendrites of bipolar cells. It is thickest at macula and contains oblique fibres known as Henle's layer.

### **6. Inner nuclear layer**

Resemble outer nuclear layer but it is very thin. This layer disappears at fovea and in rest of retina consists of the following

- ❖ Bipolar Cells
- ❖ Horizontal Cells
- ❖ Amacrine Cells
- ❖ The soma of muller's Cells
- ❖ Capillaries of central retinal vessels

### **7. Inner plexiform layer**

Essentially consists of synapses between axons of bipolar cells (first order neurons) and dendrites of ganglion cells (second order neurons). This layer is absent at foveola.

## **8. Ganglion cell layer**

The cell bodies and nuclei of ganglion cell lie in this layer. It is composed of single row of cells except in macular region. Multilayered.

## **9. Nerve fibre layer (stratum opticum)**

Essentially consists of unmyelinated ganglion cells which converge at optic nerve head, pass through lamina cribrosa. Centrifugal nerve fibres are thicker. Microglia and macroglia are neuroglial cells present in nerve fibre layer. Retinal vessels lie in nerve fibre layer but as a rule do not project on surface of retina.

## **10. Internal limiting membrane**

Consists of four elements

1. Collagen fibrils
2. Proteoglycans
3. Basement membrane
4. Plasma membrane of muller's cells

## **Blood supply of retina**

Central retinal artery, a branch of internal carotid artery and choriocapillaries.

## **Central Retinal Artery**

Arises from ophthalmic artery near optic foramina and courses with 5-6 right angle bends as follows.

### **Outside the optic nerve**

It runs as a wavy course below optic nerve, adherant to dural sheath and pierce dura and arachanoid membrane.

### **In subarachanoid space**

Bends forwards and after a short course it again bends upwards nearly right angle and invaginate pia to reach centre of nerve, surrounded by sympathetic nerve plexus.

### **In the centre of optic nerve**

The artery bends forwards and then in company with vein. It pierces Lamina cribrosa to appear inside the eye.

### **In the retina**

Four terminal branches namely superior nasal, superior temporal, inferior nasal and inferior temporal divide dichotomously as they proceed towards ora serrata, when they end with out anastomosis.

### **Blood retinal barrier**

The endothelial cells of a normal retinal capillary are closely bound together about lumen by intercelluar junction of zonula occludens type. These junctions normally prohibit a free flow of fluid and solutes from vascular lumen, into retinal interstitium, thus forms a blood retinal barrier. Presence of this barrier is confirmed by absence of fluorescein leakage from these capillaries.

The endothelial cells of retinal capillaries are encircled by basement membrane around which present a layer of pericytes, surrounded by a layer of basement membrane. Normally the endothelial cells and pericytes are present in a one to one ratio, in young individual. In certain diseases such as diabetes mellitus, there occurs a relative decrease in number of pericytes.

### **Functions of retina**

Visual functions are classified under the light sense, form sense and colour vision.

Retinal functions are tested by the following tests

- i. Visual acuity
- ii. Visual fields
- iii. Colour vision
- iv. Dark adaptation
- v. Electroretinogram (ERG) and Electrooculogram

The visual impulses reach occipital cortex after 124 m/sec following retinal stimulation.

- i. The central part of retina (macula lutea) consists mainly of cones which are responsible for vision in day light and for colour vision.
- ii. The peripheral part of the retina consists mainly of rods which are responsible for vision at night

## **Physiology of vision**

### **Introduction**

Physiology of vision is a complex phenomenon. Main mechanisms concerned with vision are.

Initiation of vision (Transduction)

Transmission of visual sensation and

Visual perception

### **Initiation & transmission of visual sensations**

The rods and cones serve as sensory nerve endings for visual sensations.

Physiologically, stimuli can be divided into 2 types

#### **Inadequate stimuli**

It produces glowing sensations called phosphenes. Mechanical stimulation by pressure of the sclera is an example of inadequate stimulus which produces pressure phosphene.

Ex: Rapid eye movements in dark produce phosphene and passage of weak electric current through retina produce electron phosphene and passage of X-rays or other ionizing radiations through the retina. (Produces radiation phosphenes)

#### **Adequate stimuli**

True visions are formed by visible portion of electromagnetic radiation spectrum. It lies between UV & IR portions from 400nm at violet end of spectrum to 750nm at red end. The white light

consists of seven colours denoted by “VIBGYOR” Light ray is the term used to describe radius of concentric wave forms.

Light falling upon retina is absorbed by the photo sensitive pigments present in rod and cones. The photochemical changes trigger a sequence of events that initiate visual sensations. The retinal receptors are active processors of information. Thus the electrical potential changes produced and actively processed in retina are transmitted through the ganglion cells and along fibres of optic nerve.

### **Visual perceptions**

Visual perceptions are functional elements of vision which result from stimulation of retina with light.

These are of 4 kinds namely

1. Light sense
2. Form sense
3. Sense of contrast
4. Colour sense

### **The light sense**

It refers to appreciation of light in all gradations of intensity. The minimum brightness required to evoke a sensation of light is called light minimum. Measured during dark adaptation for at least 20-30 minutes. Rods are much more sensitive to low illumination. It forms the basis of the Duplicity theory of vision.

### **The form sense**

It is the ability to discriminate between the shapes of the objects. Cones play a major role in this faculty. Form sense is most acute at fovea.

### **Sense of contrast**

It is the ability of eye to perceive slight changes in luminance between regions which are not separated by definite border.

### **The colour sense**

It is the ability of eye to discriminate between colours excited by light of different wave-lengths. Function of cones is thus better appreciated in photopic vision. It performs this function by different types of pigments which absorb red, green, blue wavelength of light.

### **Neurology of vision**

The visual pathway has some unique features which are explained by comparing with afferent tract.

The visual pathway consists of

1. The optic nerves
2. The optic chiasma
3. The optic tract
4. The lateral geniculate body
5. The optic radiations
6. The occipital cortex

### **The optic nerves**

The fibres arise from retina divided into temporal and nasal halves at the level of fovea centralis. The optic nerves join the optic chiasma at anterolateral angles.

### **The optic chiasma**

It is a flat, band like structure lying above pituitary fossa. In the optic chiasma there is semi decussation of nerve fibres.

- i. The nerve fibres from nasal side of each retina cross over to opposite side
- ii. The nerve fibres from the temporal side do not cross but pass into optic tracts of the same side.

### **The optic tract**

The optic tract originates from posterolateral angle of optic chiasma. They are cylindrical bands running outwards and backwards to end in lateral geniculate bodies. They consist of temporal fibres of same side and nasal fibres of opposite side.

### **The lateral geniculate bodies**

Oval structures situated at the posterior end of the optic tracts. The fibres of optic tracts end in lateral geniculate bodies and new fibres of optic radiations originate from them.

### **The optic radiations**

The nerve fibres processed backwards and medially as optic radiations to terminate in visual centres situated in occipital lobes.

## **The occipital cortex**

It is situated above and below the calcarine fissure extending up to occipital pole.

The visual nerve pathway can be divided into three parts.

1. The neuron of the first order is the bipolar cell in the retina.

The rods and cones are the sensory end organs.

2. The neuron of the second order is the ganglion cell in the retina, the process of which pass along optic nerve, optic chiasma and optic tract to the lateral geniculate body

3. The neuron of the third order takes up the impulses via optic radiations to occipital lobe (visual centre).

## **PATHOLOGY**

### **Introduction Of Diabetic Retinopathy**

Diabetic retinopathy refers to retinal changes that occur in patients with diabetes mellitus. Over the past few decades, the global burden of diabetes has grown to such a level that the disease is now considered as pandemic. According to world health organization, around 177 million people world wide suffer from diabetes and two-third of them live in the developing countries. It's expected that by the year 2030, the number of people with diabetes is doubled to 370 million.

India currently has world's largest diabetic population, with an estimation of 35 million people. Most of these people have type 2 diabetes mellitus, which is predominantly a life style disease, related to obesity, dietary habits and lack of exercise. Majority of diabetics are unaware of there diabetic status while awared person do not realize the importance of consistent follow ups with physician, most of the physicians are not trained to detect and refer sight-threatening diabetic retinopathy for a timely treatment. The data regarding alarms most diabetics develop some retinopathy in course of their life time. It is estimated that 15% Indians currently showing an abnormal glucose tolerance from which the future enormity of problem can be easily anticipated like the barrel of a

smoldering canon, which can explode in our face any time. DR is the most common cause of legal blindness between the age of 20 and 65 yrs.

The current research focuses more on disease mechanism, the risk factors, clinical features and standard treatment protocols and future strategies to counter the diabetic retinopathy are discussed.

### **Risk factors affecting diabetic retinopathy**

1. Epidemiological factors
2. Systemic parameters of diabetics
3. Genetic factors
4. Other diseases
5. Physiological factors
6. Socio economic factors
7. Local factors

#### **1. Epidemiological factors**

**a. Age :** In type I, prevalence and severity of retinopathy increase with increasing age. It is rare before the age of 13 years. In type II diabetes, the severity of retinopathy is not related to age.

**b. Sex :** No significant correlation

**c. Race :** Indians have a higher risk of developing proliferative diabetic retinopathy compared to Americans.

## **2. Systemic Diabetes**

**a. Type of DM :** Type 1 diabetics typically have a faster progression of diabetic retinopathy and more commonly lose vision due to proliferative diabetic retinopathy, while type 2 lose vision more commonly due to diabetic macular edema.

**b. Duration of DM :** After 20 years of diabetes, 99% type 1 and 60% type 2 diabetic have retinopathy and 53% type 1 and 5% type 2 patients have proliferative diabetic retinopathy.

**c. Control of diabetes mellitus:** It is less important than duration. Tight control of diabetes at earliest after detection of diabetes reduces both the incidence and progression of diabetic retinopathy.

## **3. Genetic factors**

The genetic transmission is low only 3-6% siblings and 8% off springs of diabetic patients are prone to become diabetes.

Type 2 diabetes mellitus has a stronger genetic predisposition 30% of off spring and 40% siblings are affected.

## **4. Other systemic diseases**

Hypertension is extremely common in diabetes. If poorly controlled is associated with worsening of DR and the development of PDR in both type1 and type 2 diabetes.

Nephropathy worsens diabetic retinopathy through rheological, platelet and lipid abnormalities by increasing risk of both macular edema and proliferative diabetic retinopathy.

Increased serum cholesterol causes increase in hard exudates at macula with subsequent visual compromise. This is due to increased risk of atherosclerosis and ischemic heart disease in diabetics.

Anemia aggravates retinal hypoxia by decreased oxygen carrying capacity of blood and it is an independent risk factor for high risk proliferative diabetic retinopathy and severe visual loss. When hemoglobin falls below 12 gms% the risk of retinopathy has increased to 2 fold.

## **5. Physical factors**

**a. Puberty:** The most important determinant of retinopathy is duration of diabetes after onset of puberty. The risk of disease is same in two adults whom developed diabetes at age 6 and the other at age 12.

**b. Pregnancy:** Diabetic retinopathy accelerates during pregnancy increases the risk of retinopathy twice, and also a risk factor for congenital anomalies in the newborn.

## **6. Socio economic factors**

Increasing incidence of diabetes has been linked to life style changes and urbanization. Diabetes is common in all status neither hyperglycemia nor diabetic retinopathy has been found to be associated with socio economic status.

## **7. Local factors**

While cataract occurs early in diabetic eyes, its removal poses an increased risk of anterior and posterior segment complications like a uveitis, posterior capsular opacification and cystoid macular edema. The severity of diabetic retinopathy is increased after cataract surgery, particularly if posterior capsule is torn during surgery.

Various degenerative and atrophic diseases of retina like glaucoma, myopia, optic atrophy, retinitis pigmentosa reduce metabolic demand of retina and decrease the stimulus for new vessel formation.

## **BASIC BIOCHEMICAL MECHANISMS**

### **Sorbital pathway**

Excess glucose in a diabetic's blood stream is channelled through alternative metabolic pathway, one of which is sorbital pathway. The enzyme aldose reductase converts excess glucose into an intermediate product sorbitol, intracellularly. The stabilization of sorbital as fructose sugar is a slow reaction and it occurs extracellularly. Since sorbital cannot be transported out of cell rapidly and it is osmotically active. If water accumulates inside cell, this is main mechanism for pericyte loss and adversely effect photo receptor function, retinal blood flow and vasodilation. Cataract, diabetic neuropathy also may results from this pathway.

### **Non-enzymatic glycation of proteins**

This is the mechanism of browning of meat when incubated with glucose. In diabetic eyes, there is a similar adhesion of glucose with proteins, which results in continued cross linking and formation of Advanced Glycosylation End Products (AGEP). Since it is a slow process, it only affects tissues with a slow protein turn over, like basement membrane. Quick turn over proteins like haemoglobin is not affected. Therefore HbA<sub>1c</sub> a glycosylated protein only indicates the diabetic control without affecting the function of haemoglobin.

### **Protein Kinase C Pathway**

Incomplete metabolism of excess glucose leads to accumulation of intermediates like advanced glycosylation end proteins and diacyl glycerol (DAG). Elevated levels of Diacyl glycerol result in increased activity of ubiquitous enzyme Protein Kinase C (PKC) which decreases retinal blood flow. PKC is also activated by vascular endothelial growth factor and mediate its function, mainly by blood retinal barrier breakdown and neovascular proliferation.

## **Angiogenic factors**

The angiogenic factors isolated namely X was released by hypoxic retina and it causes neovascularization of retina and iris. Of various angiogenic factors isolated, it is secreted and soluble in aqueous and vitreous, upregulated by hypoxia and is potently angiogenic. VEGF is a peptide produced mainly by extravascular tissue, glia, retinal pigment epithelium, macrophages and T-Cells. It is the major catalyst for both inner break down and new vessel formation. It is also released in response to trauma and inflammation. Other growth factors like fibroblast growth factor and insulin like growth factor have only a synergistic, supportive or permissive role adjuvant to Vascular Endothelial Growth Factor (VEGF).

## **Pathogenesis**

Diabetic retinopathy has traditionally been considered a vascular disease, primarily a capillaropathy. It is presumed to be inner retinal disease, whose pathological changes are tissue hypoxia and edema, caused by micro vascular occlusion and leakage.

## **Clinically, DR may be:**

(a) Background (non-proliferative) in which the pathology remains intraretinal,

(b) Proliferative in which the pathology extends onto or beyond the retinal surface and

(c) Pre-proliferative, which has features of imminent proliferative disease.

## **Microvascular occlusion**

### **1. Pathogenesis**

**a) Capillary** changes consist of loss of pericytes, thickening of the basement membrane and damage and proliferation of endothelial cells.

**b) Haematological** changes consist of deformation and increased rouleaux formation of red blood cells and increased platelet stickiness and aggregation, leading to decreased oxygen transport.

**2. The consequence** of retinal capillary non-perfusion is retinal ischaemia, which initially develops in the mid-retinal periphery. The two main effects of retinal hypoxia are the following

**a) Arteriovenous shunts** associated with significant capillary occlusion ('drop-out') run from arterioles to venules. As it is unclear whether these lesions represent new vessels or opening of pre-existing vascular channels, they are often referred to as 'intraretinal micro-vascular abnormalities' (IRMA).

**b) Neovascularization** is thought to be caused by 'vasoformative substances' (growth factors) elaborated by hypoxic retinal tissue in an attempt to revascularize hypoxic retina. These substances

promote neovascularization on the retina and optic nerve head (PDR) and occasionally on the iris (rubeosis iridis). Many growth factors have been identified; vascular endothelial growth factor (VEGF) appears to be of particular importance.

### **Microvascular leakage**

**1.Pathogenesis.** Breakdown of the inner blood-retinal barrier leads to leakage of plasma constituents into the retina. Physical weakening of the capillary walls results in localized saccular outpouchings of the vessel wall, termed microaneurysms, which may leak or become thrombosed.

**2.Consequences** of increased vascular permeability include the development of intraretinal haemorrhages and oedema which may be diffuse or localized.

**a) Diffuse retinal oedema** is caused by extensive capillary dilatation and leakage.

**b) Localized retinal oedema** is caused by focal leakage from microaneurysms and dilated capillary segments. Chronic localized retinal oedema leads to the deposition of 'hard exudates' at the junction of normal and oedematous retina. These exudates composed of lipoprotein and lipid-filled macrophages. When leakage ceases, they absorb spontaneously over a period of months or years, either into the healthy surrounding capillaries or by

phagocytosis of their lipid content. Chronic leakage leads to enlargement of the exudates and the deposition of cholesterol.

## **Classification and Clinical Features**

### **Background diabetic retinopathy**

#### **Clinical features**

**1. Microaneurysms** Microaneurysms are the clinical hall mark and earliest change in diabetic retinopathy. As the disease progresses, they increase in number and are accompanied by other features like soft and hard exudates, dot and blot hemorrhages, venous caliber changes and intraretinal microvascular abnormalities. Microaneurysms are located in the inner nuclear layer and are the earliest clinically detectable lesions.

**Signs.** Tiny, round, red dots, initially appearing temporal to the fovea. When coated with blood they may be indistinguishable from dot hemorrhages.

**2. Hard exudates** lie within the outer plexiform layer

**Signs.** Waxy, yellow lesions with relatively distinct margins often arranged in clumps and / or rings at the posterior pole. A ring of hard exudates (circinate exudate) often exhibits microaneurysms at its centre. With time, number and size tend to increase, and the fovea may be threatened or involved.

**3. Retinal oedema** is initially located between the outer plexiform and inner nuclear layers. Later it may also involve the inner plexiform and nerve fibre layers, until eventually the entire thickness of the retina becomes oedematous. With further accumulation of fluid the fovea assumes a cystoid appearance (cystoid macular oedema).

**Signs.** Retinal thickening is best detected by slit-lamp biomicroscopy with a Goldmann lens.

#### **4. Haemorrhages**

**a. Intraretinal haemorrhages** arise from the venous end of capillaries, and are located in the compact middle layers of the retina with a resultant red. 'dot-blot' configuration.

**b. Retinal nerve fibre layer haemorrhages** arise from the larger superficial pre-capillary arterioles and are therefore flame-shaped.

#### **Preproliferative diabetic retinopathy**

Background Diabetic Retinopathy (BDR) that exhibits signs of imminent proliferative disease is termed preproliferative diabetic retinopathy (PPDR). The clinical signs of PPDR indicate progressive retinal ischaemia. The risk of progression to proliferative disease appears proportional to the number of lesions.

## **Clinical features**

**1. Cotton wool spots** represent focal infarcts of the retinal nerve fibre layer, due to occlusion of pre-capillary arterioles. Interruption of axoplasmic transport with subsequent build-up of transported material within the axons (axoplasmic stasis) is responsible for the white appearance of the lesions.

**Signs** Small, whitish, fluffy superficial lesions which obscure underlying blood vessels and are clinically evident only in the post equatorial retina, where the nerve fibre layer is of sufficient thickness to render them visible.

**2. Intraretinal microvascular abnormalities (IRMA)** represents shunts that run from retinal arterioles to venules. Thus by-passing the capillary bed, and are therefore often seen adjacent to areas of capillary closure.

**Signs** Fine red lines that run from arterioles to venules. Thus resembling focal areas of flat retinal new vessels. The main distinguishing features of IRMA are their intra retinal location, their failure to cross major retinal blood vessels.

### **3. Venous Changes:**

Veins are dilated, tortuous, reduplicated, looped or beaded in diabetic retinopathy, venous beading is important indicator of retinal hypoxia and diabetic retinopathy progression. This appearance is called also '**Sausage-like**' Segmentation.

#### **4. Arterial Changes**

Consisting of narrowing, silver-wiring and obliteration resembling a branch retinal artery occlusion.

**5. Dark blot haemorrhages** represent haemorrhagic retinal infarcts and are located within the middle retinal layers.

### **Diabetic maculopathy**

It is the most frequent cause of visual impairment. It may occur at any stage of diabetic retinopathy. But is more common in advanced stages when edema occurs close to or at the centre of macula, it is called Clinically Significant Macular Edema (CSME). Involvement of the fovea by oedema and hard exudates or ischaemia (diabetic maculopathy) is the most common cause of visual impairment in diabetic patients, particularly those with type 2 diabetes.

#### **Classification**

##### **1. Focal exudative**

**Signs** Well-circumscribed retinal thickening associated with complete or incomplete rings of perifoveal hard exudates.

##### **2. Diffuse exudative**

**Signs** Diffuse retinal thickening, which may be associated with cystoid changes. Obliteration of landmarks by severe oedema may render localization of the fovea impossible.

### **3. Ischaemic**

**Signs** Reduced visual acuity in association with a relatively normal appearance of the fovea. Associated PPDR is frequent. Dark blot haemorrhages may be seen.

**4. Mixed** is characterized by features of both ischaemia and exudation.

### **CLINICALLY SIGNIFICANT MACULAR EDEMA (CSME)**

#### **Definition**

Clinically Significant Macular Edema (CSME) has the following characteristics.

- ❖ Retinal edema within 500  $\mu\text{m}$  of the centre of the fovea.
- ❖ Hard exudates within 500  $\mu\text{m}$  of the centre of the fovea, if associated with adjacent retinal thickening (which may be outside the 500  $\mu\text{m}$  limit).
- ❖ Retinal edema one disc area (1500  $\mu\text{m}$ ) or larger, any part of which is within one disc diameter of the centre of the fovea.

#### **Proliferative diabetic retinopathy**

PDR affects 5-10% of the diabetic population. Type-1 diabetics are at particular risk with an incidence of about 60% after 30 years.

## **CLINICAL FEATURES**

**Signs** Neovascularization is the hallmark of PDR. New vessels may proliferate on or within one disc diameter of the optic nerve head (NVD = new vessels at disc), or along the course of the major vessels (NVE = new vessels elsewhere), or both. It has been estimated that over one-quarter of the retina has to be non-perfused before NVD develop. The absence of the Internal Limiting Membrane (ILM) at the optic nerve head may partially explain the predilection for neovascularization at this site. New vessels start as endothelial proliferations, arising most frequently from veins, they then pass through defects in the ILM to lie in the potential plane between the retina and posterior vitreous cortex, using the latter as a 'scaffold' for their growth.

### **Clinical assessment**

**1. Severity** of PDR is determined by the area covered with new vessels in comparison with the area of the disc. The severity of PDR is described as follows:

#### **a) NVD**

- ❖ Mild when less than one-third disc area in extent
- ❖ Severe when more than one-third disc area in extent

#### **b) NVE**

- ❖ Mild if less than half disc area in extent.
- ❖ Severe if half disc area or more in extent.

**2. Elevated** new vessels are less responsive to laser therapy than flat new vessels.

**3. Fibrosis** associated with neovascularization is important, since significant fibrous proliferation, although less likely to bleed, carries an increased risk of tractional retinal detachment.

**4. Haemorrhage** which may be preretinal (subhyaloid) and/or intragel vitreous is an important risk factor for visual loss.

**5. High risk characteristics.** The following signify a high risk of severe visual loss within 2 years, if left untreated.

- ❖ Mild NVD with haemorrhage carries a 26% risk of visual loss,
- ❖ Severe NVD without haemorrhage carries a 26% risk of visual loss.
- ❖ Severe NVD with haemorrhage carries a 37% risk of visual loss,
- ❖ Severe NVE-with haemorrhage carries a 30% risk of visual loss.

## **Histopathologic changes**

### **Capillary basement membrane thickening**

Glycation of capillary basement membrane collagen results in its thickening directly and by decreased proteoglycan levels. There is vacuolization of basement membrane resulting in increased platelet adhesion reduced diffusion of nutrients and decreased binding of growth factors which are released in blood stream free to induce angiogenesis.

### **Loss of Micro vascular intramural pericytes**

Sorbital accumulation along with free radicals destroys pericytes which are muscles of capillaries and maintain their tone, pericytes loss results in formation of microaneurysm by focal dilatation of weakened capillaries and thickening of its membrane.

### **Endothelial cell damage**

Accumulation of sorbital, advanced glycosylation end products and glucose itself is toxic to capillary endothelium. The damage is exacerbated by accelerated blood flow, which results in leakage from the inner BRB, acellularity of capillaries and adhesion of leukocyte to capillary wall.

### **Hematological alterations**

RBC and WBC become less deformable, platelets aggregate more easily, Formation of thrombus in capillaries, consequent capillary occlusion is prolonged by a defective fibrinolytic mechanism, resulting in retinal ischaemia.

### **Diabetic retinopathy, an inflammatory disease**

Diabetic retinopathy has only two macroscopic signs of inflammation

- i. Swelling
- ii. Loss of function

## **Microscopic attributes of inflammation**

Vasodilation

Altered blood flow

Fluid and protein exudation

Leucocytosis

Leucocytes clog capillaries more efficiently than RBC because of large size and less pliability.

Vascular endothelial growth factor, released by capillary shut down and hypoxia is also released during inflammation. From this it is evidence that diabetic retinopathy may be a chronic low grade inflammation.

## DISCUSSION

For the present study, the disease '**Mega thimiram**' is selected based on clinical features given by Nagamuni in his treatises 'Nagamuni Nayana Vidhi-200'. Nagamuni has clearly explained about pathology of the disease and given the opt title mega thimiram, as it is a complication of mega diseases.

The aetiology and pathogenesis of mega disease and as well as mega thimiram both were demonstrated in siddha literatures and it is very important because the aetiogenesis and correct diagnosis of a disease is an essential prerequisite for evolving correct treatment regimen.

The prime aim of this dissertation is to arrive at a correct diagnosis of Mega thimiram through Envagai thervugal, Mukkutra verupadugal, Changes in Udal kattugal, Kaalam along with Modern diagnostic parameters. Apart from the major criteria, Age distribution, Dietary changes, Socio-economic changes, Occupational status, Thinai, Onset of disease etc., were also taken in to account in arriving at the diagnosis.

'Mega thimiram', one among the seven types of thimiram as mentioned earlier is a complication of mega noi, with the symptoms of diminution of seven physical constituents, gradual vascular

constriction, gradual diminution of vision, moderate burning sensation of the eye.

Humoural changes and hereditary changes are important pathogenic factors which cause changes in the seven physical constituents in bringing out the diseases. These changes in physical constituents are diagnosed through the eight fold physical examination (Envagai thervugal).

Twenty patients were selected for this study and they were properly enrolled in the outpatient department.

## **DIAGNOSIS OF MEGA THIMIRAM**

### **Age distribution**

Out of 20 patients, majority of 15 patients falls under the age of 51-75 years and 5 patients at 26-50 years. Majority of the patient falls under fifth decade.

### **Sex distribution**

Among 20 patients, 13 were males and 7 were females. so mega thimiram can affect both sex. Males and females are affected more or less equally.

### **Kaalam:**

Among the 20 patients, 19 patients belong to pitha kaalam, and only one patient to kabha kaalam.

**Thinai:**

Among the 20 patients, majority of 15 patients belong to marutham.

**Dietary changes:**

Both vegetarian and mixed diet groups were affected.

**Socio economic status:**

Among 20 patients, 8 patients belong to poor class, 8 patients belong to middle class and 4 patients to upper class. So it is common in all static groups of people.

**Onset:**

Chronic onset.

**Humoural variations (Mukkuutra verupadugal)**

Vaatham, pitham and kabham are three vital forces which form the functional units of human body. The following changes are noted in this disease.

**(i) Vaatham :**

- Abanan – Affected -20 patients-(Polyurea)
- Viyanan – Affected -20 patients-(Decreased peripheral Utilization of glucose)
- Uthanan – Affected-20 patients-(Increased appetite, affected distribution)
- Samanan – Affected-20 patients-(As above all are affected samanan is also affected)

Koorman - Affected-20 patients-(Diminished vision)

Kirugaran - Affected -12 patients-(Polyphagia ,  
Polydipsia)

**Pitham :**

Ranjaga pitham - Affected-5patients-(reduced  
haemoglobin level)

Prasaga pitham - Affected -10 patients-(Reduced  
skin complexion)

Aalosaga pitham - Affected -20patients-(Diminished vision)

Sathaga pitham - Affected -20 patients- (Inability to  
perform regular activities due to  
diminution of seven physical  
constituents)

**Kabham:**

Avalambagam - Affected-20 patients-(As the below, four  
kabhas are affected avalambagam is  
also affected )

Tharpagam - Affected -5 patients-(Burning sensation  
of the eye)

Santhigam - Affected-20 patients-( Joint pain.  
Degeneration of cartilage)

**UDAL KATTUGAL:**

- Saaram – Affected-20 patients- (Increased appetite and thirst)
- Seener – Affected -20 patients-(Decreased body weight, Lassitude, Anemia, function of vision is diminished, Increased blood sugar level)
- Oon – Affected-20 patients-(Atrophy and weakness of large muscles, lethargy of eyes)
- Kozhuppu – Affected-20 patients-(Joint pain, Emaciation.)
- Enbu – Affected-20 patients-( Joint pain, In chronic stage demineralization of bones)
- Moolai – Affected -20 patients-( Blurred vision)
- Sukkilam /
- Suronitham – Affected-20 patients-(Sexual desire, sexual impotence, erectile dysfunction, retrograde ejaculation)

**Interpretation of Envagai Thervugal:**

## Naadi

- Kabhavaatham - 6 patients
- kabhapitham - 6 patients
- pithavaatham - 3 patients
- pithakabham - 5 patients

Most of the patients had Kabhavaatham, kabhapitham and pithakabham Nadi.

Naa - Affected -16 patients-(coated, dry and crack)

Niram - Affected -10 patients (Reduced skin Complexion)

Vizhi - Affected 20 patients (Dullness of vision)

Sparisam - Affected -10 patients (Hypothermia, cold clammy skin)

Malam - Affected - 5 patients (Constipation)

Moothiram - Affected 20 patients (polyurea, glucosuria)

Neerkuri -

Niram - Yellow colour - 3 patients

Straw colour - 1 patient

Deep yellow - 1 patient

Water like - 2 patients

Manam - Sweety odour - 5 patients

Enjal - Present - 9 patients

Neikuri -

Oil lengthens like snake - 2 patients

Oil spreads like a ring - 15 patients

Oil resembles like a pearl - 3 patients

Most of the Neikuri report as Pitha Neer.

## **INTERPRETATION OF ALLIED PARAMETERS:**

### **Lab investigation:**

**Blood sugar level** : Patients with uncontrol diabetes may prone to the stage of retinopathy early, and good glycemc control delay the complcation.

**Urine sugar** : Mild to severe are found in all patients.

Both Blood sugar and Urine sugar give a evidence of hyperglycemia.

**Blood urea, serum creatinne** : Out of 20 patients 2 have increased blood urea and serum creatinne.

**Urine Albumin** : Present in 13 patients. Evidence of patient having nephropathy.

### **Blood Pressure:-**

Out of 20 patients 2 patient have hypertension.

### **Eye Examination:-**

Vision - affected 20 patients – diminished vision.

Lens - shows mature cataract and PCIOL.

Tension - 3 patients had incresed tension.

Fundus -

NPDR - 7 patients

Moderate NPDR - 4 patients

Moderate NPDR

with CSNE - 1 patient

Severe NPDR - 4 patients

PDR - 3 patients

High risk PDR - 1 patient

## HIGHLIGHTS OF DISSERTATION

- ❖ According to dietary changes, seasonal variations and Thinai, kabham gets deranged along with abanan, followed by diminution of seven physical constituents one by one and finally the udal thee.
- ❖ As a result of derangement of kabham, vaatham and pitham also gets deranged causing many pathological diseases.

“குறியுடனே மேகந்தான் கொடுமை செய்து

குறைந்து வந்த வருந்தாது வெல்லாங் குன்றிப்போகும்”

- ❖ From the above line, Mega disease cause diminution of seven physical constituents.

### Dwelling places of kabham

“கூறினோம் சிலேற்பனமது சமான வாயு

கொழுகியடா சுழிமுனையைப் பற்றி விந்தில்

சீறியே சிரசிலாக் கிணையைச் சேர்ந்து

சிங்குவை அண்ணாக்கு நிணமச்சை ரத்தம்,

மீறியே நிறங்கோணம் நரம்பெ லும்பில்

மேவியதோர் மூளைபெருங் குடலிற் கண்ணில்

தேறிய தோர் பொருந்திடங்க னெல்லாஞ் சேர்ந்து

சிலேட்டுமது வீற்றிருக்குந் திடங் கண்டாயே”

Samanan, aakinai in head, vindhu, moolai, tongue, tonsil, fat, bone, bone marrow, blood, nerve, large intestine and eye.

## **Properties of kabham**

It gives stability, lubrication, holding together of the joints, power endurance for hunger, thirst and sorrow, disturbed mind and heart.

## **Types of kabham 5**

### **1 .Avalambagam:**

It is present in the lungs and is responsible for the basic functions of the heart and other four types of kabham.

### **2. kilethagam:**

It is present in the stomach. It makes the food wet and helps for digestion.

### **3. Pothagam:**

It is present in the tongue and is responsible for sense of taste.

### **4.Tharpagam:**

It is located in the head and keeps the eye cool.

### **5. Santhigam:**

Located in the joints and responsible for free movements of the joints.

- ❖ The deranged humour (Kabha) affects the physical constituents such as fat, blood, bone, bone marrow, nerve, vindu and sense organ eye. Thus the derange kabha affects eye directly and

affected all the physical constitutents with other altered humours (Vatham and Pitham).

As the result of Mega Noi there is growing dullness of vision occurs.

### **Naadi Nadai**

“இருமியே வாதமும் பித்தமுங் கூடல்  
மருவுசல மேகம் வாருதி போலாகும்  
உருவம் வேறாகு முண்டவுடற் காந்திடும்  
உருகவே வுனோடு உறிஞ்சி இனிக்குமே”

- திருமூலர் நாடி

- ❖ The above stanza describes that excessive elimination of urine containing sugar is primarily due to combined vitiation of vatha and pitha functional factors in the body.
- ❖ The pitha and vatha vitiation is indicated clinically by excessive hunger, thirst, over-eating, emaciation and passing of large quantities of urine.

“பார்த்திடு மூன்றும் பதிந்து மெலிந்து நிற்கில்  
தேர்ந்திடு மேகம் உந்தோன்றியே பொருந்தி மெய்யில”

- திருமூலர் நாடி

- ❖ The above lines indicate that when there is any functional alteration of the Vaatha, pitha and kabha all the full clinical pictures of meganeer appears.

“இனிக்கின்ற வாதத் திடைசேரில் ஐயந்தான்  
பனிக்கின்ற கள்ளும் பதனிபோல் நிரோடும்  
கனிக்கின்ற மேனி கரைந்து வெளுப்பேறும்  
கனிக்கு மது மேகந் தப்பாதை யாமே ”

- திருமூலர் நாடி

- ❖ The above poem indicates that initially vaatha and kabha get deranged leading to vitiation of pitha thathu also finally.
- ❖ When the aggravated vatha naadi combines with aggravated kaba naadi, there is genesis of mega disease in the body.

“துரணமுடன் நிர்ப்பாடு நேர்பா டானற்  
சொல்லுகிறேன் நாடியெல்லாந் தளர்ந்து காணும்”

- பரிபூரண நாடி

- ❖ In the above lines, it is said that all the three naadis are feeble and weak in extensive madhumegam.

“பற்பிடத்த மேகமென்றால் பித்த மீளும்  
பாலகனே காங்கை கொண்டு நீராம் பாரே”

- பரிபூரண நாடி

- ❖ By the above line it is clearly stated that aggravation of pitha naadi results in increased udal kaangai. Eventually this leads to emaciation of seven udal thathu resulting in meganeer.

## CONCLUSION

The identification of disease and its pathogenesis are a prerequisite to best medical practice and correct treatment regimen. A detailed history – taking, clinical examination, envagai thervugal as per our siddha guidelines is necessary to arrive at a precise diagnosis.

The study on '**Mega Thimiram**' concludes that it is a disease of complication of megam, which has a gross relevance to modern clinical entity **Diabetic retinopathy**.

Clinical examination by modern methods helps much in diagnosing the disease. As early diagnosis of diabetes, diabetic retinopathy and proper treatment are essential prerequisite to save total blindness.

The vitiation of Mukkutra verupadugal and seven physical constituents are major criteria in the pathogenesis of the disease.

The opt diagnosis can be arrived by detailed history taking , clinical examination by modern methods, Envagai thervugal and assessing the changes of physical constituents and three humours.

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**EYE EXAMINATION**

S.No	Case No	Lids		Conjunctiva		Cornea		Ant. Chamber		Iris		Pupil		Lens		Ocular Movements		Vision		Tension mm / Hg		Ducts		Fundus
		RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	
1	01	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	PCIOL	IM	Full	Full	6/18	3/60	22	19	Free	Free	B/L PDR
2	02	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	PCIOL	IM	Full	Full	6/18	6/18	17.3	17.3	Free	Free	B/L NPDR
3	03	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	Clear	IM	Full	Full	6/9	6/9	12	12	Free	Free	B/L Severe NPDR
4	04	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	IM	PCIOL	Full	Full	6/36	6/18	14	18	Free	Free	B/L Severe NPDR
5	05	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	IM	PCIOL	Full	Full	6/12	6/12	17	20	Free	Free	B/L Moderate NPDR
6	06	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	IM	IM	Full	Full	6/36	6/18	14	16	Free	Free	B/L Moderate NPDR With CSME
7	07	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	Clear	IM	Full	Full	6/6	6/4	17.3	17.3	Free	Free	B/L Moderate NPDR
8	08	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	Clear	IM	Full	Full	6/60	6/18	17.3	17.3	Free	Free	Rt.PDR Lt.NPDR
9	09	N	One eyed	N	-	Clear	-	ND	-	NCP	-	Acting	-	IM	-	Full	-	6/9	-	17	-	Free	-	NPDR
10	10	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	IM	PCIOL	Full	Full	6/24	6/18	14.6	14.6	Free	Free	Moderate NPDR
11	11	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	PCIOL	IM	Full	Full	6/18	6/18	14	16	Free	Free	PDR
12	12	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	PCIOL	IM	Full	Full	6/24	6/18	14.6	14.6	Free	Free	B/L.NPDR
13	13	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	Clear	IM	Full	Full	6/36	6/18	17	17	Free	Free	HR. PDR
14	14	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	IM	Clear	Full	Full	6/24	1/60	20.2	20.2	Free	Free	B/L. Moderate NPDR
15	15	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	IM	Clear	Full	Full	4/60	6/60	14.6	14.6	Free	Free	PDR
16	16	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	Clear	IM	Full	Full	6/36	6/60	18.6	20.6	Free	Free	NPDR
17	17	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	IM	Clear	Full	Full	6/60	6/60	17.3	14.6	Free	Free	NPDR
18	18	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	IM	PCIOL	Full	Full	6/24	3/36	19.8	18	Free	Free	NPDR
19	19	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	Clear	IM	Full	Full	2/60	6/60	17.3	18.6	Free	Free	NPDR
20	20	N	N	N	N	Clear	Clear	ND	ND	NCP	NCP	Acting	Acting	Clear	IM	Full	Full	6/60	6/60	17.6	17.3	Free	Free	NPDR

RE - Right Eye, LE - Left Eye, N - Normal, ND - Normal Depth, NCP - Normal Colouring Pigment, PCIOL - Posterior Chamber Intra Ocular Lens, IM - Immature Catract, PDR - Proliferative Diabetic Retinopathy, NPDR - Non Proliferative Diabetic Retinopathy, CSME - Clinical Significant Macular Edema

# P.G.RESEARCH CENTRE

GOVT.SIDDHA MEDICAL COLLEGE, PALAYAMKOTTAI

NOI NADAL BRANH – V

## Annexure – 1

Name of the medical unit :  
I.P.No./OP.No : Nationality :  
Name : Religion :  
Age : Date of Admission :  
Sex : Date of Discharge :  
Occupation : Diagnosis :  
Income : Results :  
Address : Medical Officer :

---

Complaints & Duration :  
H/O Present illness :  
H/O Previous illness :  
Personal History :  
Family History :

## Clinical Examination – Siddha aspect

### General Examination

Yakkai	:
Gunam	:
Irukkai nilai	:
Padukkai nilai	:
Suvasa enn	:
Kuruthi azhutham	:

### Special Examination

#### Pori / Pulan

Mei	-	Sensation	:
Vaai	-	Taste	:
Kan	-	Sight	:
Mooku	-	Smell	:
Sevi	-	Hearing	:

#### Kanmendriyam / Vidayam

Vaai	-	Vasanam	:
Kai	-	Dhanam	:
Kaal	-	Kamanam	:
Eruvai	-	Visarkam	:
Karuvai	-	Anantham	:

## **Paruvakalam**

Karkalam :  
Koothirkalam :  
Munpanikalam :  
Pinpanikalam :  
Elavernirkalam :  
Mudhuvanirkalam :

## **Utkayam / Athakayam**

Puyam - Foreran :  
Sayam - Arm :  
Kaal - Leg :  
Paatham - Feet :

## **Uyir thathukkal**

### **1)Vatham**

Pranan :  
Abanan :  
Viyanan :  
Uthanan :  
Samanan :  
Nagan :  
Koorman :  
Kiruهران :  
Deathathan :  
Dhananjayan :

## 2) Pitham

Anilam	:
Ranjagam	:
Pirasagam	:
Aalosagam	:
Sathagam	:

## 3) Kabham

Avalambagam	:
Kilethagam	:
Pothagam	:
Tharpagam	:
Santhigam	:

## Ezhu Udal Thatthukkal

Saaram	:
Senneer	:
Oon	:
Kozhuppu	:
Enbu	:
Majjai	:
Sukkilam / Suronitham	:

# EN VAGAI THERVUGAL

## MEI KURI (SPARISM)

### Examination of the Skin

#### Inspection

Colour of the Skin

Eruptions

Haemorrhages

Ulcers, excoriations, fissures etc.

Boils, carbuncles, scars, trophic changes etc.

#### Eruption

##### *Types of rashes*

Maccular

Roseolar

Erythematous

Papular

Pustular

Lenticular

Nodular

Vesicular

Bullous

Wheals

Burrows

Blackheads

Plaques

Scales

### *Ulcers*

- Duration
- Mode of onset
- Associated pain
- Size and pain
- Nature of the floor
- Character of the edge
- Discharge
- Tenderness
- Surrounding skin
- Lymphnodes

### *Pruritis*

- Infestation
- Skin diseases
- Metabolic & endocrine
- Hepatic disorders
- Renal diseases
- Blood diseases

### **Examination of the hair**

- Falling of the hair
- Patchy loss of hair
- Loss of hair in temporal region
- Characteristic features of the hair

### **Sweat**

- Physiological / Pathological

## Lymphglands

Site

Shape

Size

Consistency

Mobility

Tenderness

## Examination of the nails

### **Examination of the Head, neck, Face**

#### *Skull*

Size

Shape

#### *Face*

Eyebrows

Eye lids & Eye lashes

Nose

Lips

Ears

#### *Neck*

## Examination of the Chest

Shape and Size

Movements

Rate of respiration

Breath Sounds : Normal / Abnormal

Heart Rate & Sounds

## Examination of the Breast

## Examination of the Abdomen

Shape

Size

## Examination of the Genital Organs

## Examination of the Extermitis

*Upper & Lower Limb* : General Examinations  
Special Examinations  
Tests for Tone, Power & reflex

## NIRAM

Colour of the skin, Hair, Nail, Teeth, Tongue, Gums

Sputum – Normal / Abnormal

## MOZHI

### *Larynx*

Congenital

Acquired

Traumatic

## ***Tongue***

Congenital Abnormalities

***Ear*** : Deafness

***Palate*** : Cleft palate

## VIZHI

### **Examination of Eye**

Visual acuity

Visual field

Colour sense

### **Pupil**

Size

Equality

Regularity

Reaction of light accommodation

### **NAA**

Colour

Size

Shape

# IRU MALAM

## **Malam**

### *I. Macroscopic Examination*

Amount

Colour

Odour

Consistency

Abnormal Constituents

### *II. Microscopic Examination*

### *III. Chemical Examination*

## **Siruneer**

Quantity

Colour & Transparency

Specific Gravity

Deposit

## **NAADI**

The state of vatha, pitha and kabha naadi.

## **Examination of Pulse & its Indication**

Rate

Rhythm

Volume

Force &

Character

## **Noi kanippu**

# MODERN ASPECTS

## ANNEXURE – II

### General Examination

Consciousness	:	General Appearance	:
State	:	Nourishment	:
Weight	:	Facies	:
Height	:	Jaundice	:
Skin Changes	:	Engorged venis	:
Anaemia	:	Clubbing	:
Cyanosis	:	JVP	:
Pedal Odema	:	Koilonychia	:
Abdominal distension	:	Brittle Nail	:
Congenital anomaly	:		
Lymphadenopathy	:		

Pluse	Rate	Rhythm	Volume		Character
			(Rt)	(Lt)	
Blood Pressure : mm/Hg		Upper limb	-----	-----	
		Lower limb	-----	-----	

Respiratory Rate:

### Systematic Examination

- Cardiovascular System :
- Respiratory System :
- Gastro intestinal System :
- Central nervous System :

## Laboratory Investigations

### *Blood*

TC	:	MCV	:
DC: P, L, E, B, M	:	MCH	:
Hb%	:	MCHC	:
ESR	:	Serum Protein	:
1/2hr	:	Serum Cholestrol	:
1hr	:	Blood Urea	:
RBC Count	:	Serum Iron	:
Platelet Count	:	Serum Ferritin	:
Reticulocyte Count	:	Serum TIBC	:
PCV	:	Peripheral Blood Smear	:

### *Motion*

Ova	:
Cyst	:
Occult blood	:

### *Urine*

Albumin	:
Sugar	:
Deposits	:
Bile Salt	:
Bile Pigment	:

## **Special Investigation**

Barium meal and endoscopy :  
Bone marrow examination :  
Skiagram :  
Sputum for AFB :  
Radiological investigation :  
Ophthalmoscopic examination :  
E.C.G.

*Etc.* :

*Case Summary* :

*Fate of the Disease* :

*Line of treatment* :