A STUDY ON
KUVALLAI VIPURUTHI

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INTRODUCTION

Health is a common theme in most cultures, in fact all the communities have their own concept of health, as part of their culture. Every culture in the world have developed a system of medicine, and history of their medicine is one aspect of the history of culture. World Health Organization defined health as

“Health is a state of complete physical, mental and social well being and not merely an absence of Disease (or) infirmity”

The term disease – literally means “without ease” (easiness)

Disease - The opposite of ease, when something wrong with bodily function. For long, man was in darkness about the causation of disease, several theories were advanced from time to time to explain disease causation.

The concept of the disease causing factors were in vague

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Primitive man</td>
<td>The super natural theory of disease</td>
</tr>
<tr>
<td>Indians</td>
<td>The theory of “Trihumors”</td>
</tr>
<tr>
<td>Greeks</td>
<td>The theory of “Four humours”</td>
</tr>
<tr>
<td>In 18th century</td>
<td>The theory of spontaneous generation</td>
</tr>
</tbody>
</table>
In 19th century - Microbial (Germ theory of disease)

Now going on - “Multi factorial” theory of disease (Social, economical, cultural, genetic, and psychological which are equally important)

The medical system that are truly Indian in origin and development are the two pillars of Indian system of medicine. The one is Siddha and the another one is Ayurvedha

Siddha – means - wisdom

Ayurvedha – means - ayul + vedha “Knowledge of Life”

Both are same concept, but siddha and its origin is traced for back to the vedic times about 5000B.C

Hippocratus – Great physician in Greek medicine (460 – 370BC) who is often called “Father of modern medicine”

He says the concept of the health and disease stressed the relations between man and his environment. The Greek believed that, the matters was made up of four elements
“Earth – air – fire – water” - concept strongly similar with the five elements theory of siddha

“பரும்பா புத்தகமாதி மேல்பாற்றி தீனு

பிள்ளாற் மாயாம் தவற்றிலிருந்து

செங்குட்டு சமாதக...”

- சத்ருக்கரர்

In siddha system the diseases are classified broadly as 4448 disease by siddhars, based on the “Thridhosic theory”
SIDDA PHYSIOLOGY

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

The siddha criteria explains the mechanisms of the human body on the basis of 96 thathuvas

These 96 basic principles are the structural units of the body. Apart from these, the body rely on

7 physical constiuents - Udal kattukkal
6 tastes - Suvaigal
14 Reflexes - Vegangal
3 Immunities - Udal Vanmai
4 Body fires - Udal thee

The Ninety Six Basic Principles are as follows

1. Bhootham (Elements) - 5
2. Pori (organs) - 5
3. Pulan (senses) - 5
4. Kanmenthriyam (organs of perception) - 5
5. Kanmenthriya vidayam
   (organs of action) - 5

6. Karanam (Intellectual power) - 4

7. Arivu (intellect/wisdom) - 1

8. Naadi (Channels) - 10

9. Vayu (vital Airs) - 10

10. Asayam (Visual cavities) - 5

11. Kosam (Vestures of the soul) - 5

12. Adharam (stations of soul) - 6

13. Mandalam (Regions) - 3

14. Malam (Principles of Moral Evil) - 3

15. Dhosham (Humours) - 3

16. Edanai (Physical Bindings) - 3

17. Gunam (cosmic qualities) - 3

18. Vinai (Deeds) - 2

19. Raagam (Predominent passions) - 8

20. Avathai (States of soul) - 5

**Bhootham – 5**

Ether, Air, Fire, Water, Earth

"இன்வழியாக கீழ்வழியாக விளக்கமேற்கும்படி
கல்வேத மக்கள் சந்தா துறைமை"
The Earth is the first element. It determines the shape of the body and nourish it through food.

The water is the second element. It keeps the body cool and prevents it from excessive heat. It plays an important role in the process of metabolism.

Fire is the third element, it is the major factor for the digestion of food and it determines the spiritual activities of the body and the soul.

Air is the fourth element. it stabilises the body through the process of respiration.

Ether is the fifth element. it gives the life force to the organisms.

Pori-5:

Mei, Vaai, Kann, Mooku, Sevi.

Pulan-5:

Saptham, Sparisam, Roopam, Rasam, Gantham.

Kanmenthiriyam-5:

Mei, Vaai, Kaan, Kai, Eruvaai, Karuvaai.

Gnanenthiriyam-5:
Vasanam, Kamanam, Dhaanam, Visarkam, Aanatham.

**Anthakaranam-4:**

Manam, Buthi, Sitham, Agankaram.

**Arivu-1:**

**Nadi-10:**

Idakalai, Pinkalai, Suzhumunai, SiguvaI, Purudan, Gaandhari, Athi, Alambadai, Sangini, Gugu.

**Vayu-10:**

Praanan, Abaanan, Viyannan, Uthanam, Samaanan, Naagan, Koorman, Kirugaran, Thaevathathen, Dhananjeyan.

**Aasayam-5:**

Amaravaasayam, Pagirvaasayam, Salavaasayam, Malavaasayam, Sukilavaasayam.

**Kosam – 5**

Annamayakosam, Praanamayakosam, Manomayakosam, Vingnamayakosam, Anandhamayakosam.

**Aathaaram-6:**

Moolaatharam, Swaathitanam, Manipooram, Anaagatham, Visuthi, Aakinai.

**Malam-3 :**

Aanavam, Kanamam, Maayai.

**Mandalam-3:**
Gnayiru, Thingal, Agni.

**Thodam-3:**

Vatham, pitham, Kabam.

**Vatham - 10**

**Pitham - 5**

Anarpitham, Ranjaga pitham, Sathagapitham, Alosaga pitham, Prasaga pitham.

**Kabam -5**

Avalambagam, Kiledhagam, Pothagam, Tharpagam, Sandhigam.

**Eedanai-3:**

Porulpatru, Pudhalvarpatru, Ulagapatru.

**Gunam-3**

Sathuvam, Raasadham, Thaamasam.

**Vinai-2:**

Nalvinai, Theevinai.

**Raagam-8:**

Kaamam, Krutham, Ulobam, Moham, Madham, Marchariyam, Idumbai, Agankaaram.

**Avathai-5:**

Nanavu, Kanavu, Urakkam, Paerurakkam, Uyirpadakkam.

**Udal Kattugal:**

The human body is built up by the 7 Udal Thathukkal.
Saaram, Senneer, Oon, Enbu, Moolai, Kozhuppu, Sukkilam / Sronitham.

As the digestion takes place in the body, Rasam(Saram) is formed on the very first day and all other thathus are formed one by one and end on 7th day.

**Vegangal:**

These are natural reflexes conditioned and unconditioned of the human body.

Vadham, Thummal, Siruneer, Malam, Kottaavi, Pasi, Neervetkai, Kasam, Ilaippu, Nithirai, Vaanithi, Kanneer, Sukkilam, Swasam, Kanneer.

**Tears:**

The tears is secreted by lacrimal gland to keep the eyes in moisturising state and protect from foreign bodies.

**Suvaigal:**

"quez;m;jPf;fhy; Kiwahf
Nrh;e;jpl;lhy; tUNkapdpg;G
jpz;zkpyk; Jth;g;gpurk; rjhfjpNahlhh;
JpaM; jplkh Kiwg;Gk;.
V o k h  K t h ; g ; G k ;
cz;zpa mWRitapd; gpwg;gpnjDk; FUrpj;jh;
c i u j ; j  k i w N a "
The Sense of taste explained here is six types. They are:

Inippu, Pulippu, Uvarppu, Kaarppu, Kaippu, Thuvarppu.

**Udal Vanmai:**

Iyarkai Vanmai, Seyarkai Vanmai and Kaala vanmai.

**Iyarkai Vanmai:**

It is considered with 3 Gunangal (Sathuva, Raso, Thamo)

It denotes the natural immunity or stamina of the body at birth.

**Seyarkai Vanmai:**

Improving the health condition by nutritious diet and medicines.

**Kala Vanmai:**

Development of immunity and stamina according to the age and environment.

**Body Fires:**

Samanakini, Mandhaakini, Dheekshanaakini, Vishamaakini.

**Body Constitution:**

Vadha deghi, Pitha deghi, Kaba deghi.
There are physiological aspects explained by the siddhars. Alter in physiology results in pathology.

**SIDDHA PATHOLOGY**

The changes of the three **humours** are called **Mukkuttram**. The alteration in Mukkuttram is the basic principle of all diseases.

The changes in the Uyir thathu (mukkuttrams) caused by

1. Variations in the intake of diet
2. Alteration in the Udal kattukkal
3. Environmental changes
   a. Seasonal variations of humours
   b. Regional variation of humours
4. Self suppression of fourteen vegams
5. In appropriate physical activities.

When the $1: \frac{1}{2} : \frac{1}{4}$ normal Mathirai proportion of the uyirthathus are disturbed, it leads to mukkuttram diseased condition.

"பிற்புடைத் தாயாவில் திறன் வெப்பம் துற்காக
மற்றும் முடியாய் சாஸ்திரிய வந்து"  
- சந்தேசான்
The three humours changed and causes disease by self exaggeration and combining with other humour.

And thus the diseases are classified under 9 major groups of Naadi Nadai

1. Vatha Naadi (Self exaggeration of vatham)
2. Vatha Pitham
3. Vatha Kabham
4. Pitha Naadi (Self exaggeration of pitham)
5. Pitha Kabham
6. Pitha Vatham
7. Kabha Naadi (Self exaggeration of kabam)
8. Kabha Vatham
9. Kabha Pitham

The Thannilai Valarchi and Vettrunilai Valarchi of the three humours causes the symptoms of increasing and decreasing properties of Uyirthathus.

<table>
<thead>
<tr>
<th>Humour</th>
<th>Increased</th>
<th>Decreased</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vatham</td>
<td>Wasting, Blackish</td>
<td>Body pain, Feeble</td>
</tr>
<tr>
<td>Pitham</td>
<td>Kabham</td>
<td></td>
</tr>
<tr>
<td>---</td>
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<td></td>
</tr>
<tr>
<td>Yellowish discoloration of conjunctiva, skin, urine and faeces, polyphagia, polydypsia, burning sensation all over the body, Decreased sleep</td>
<td>Loss of appetite, cold, pallor, features of increased kabham</td>
<td></td>
</tr>
<tr>
<td>discoloration, Affinity on hot food, Tremors, Distended Abdomen, Constipation, Weakness, Insomnia, Weakness in Sense organs, Giddiness, Brisklessness.</td>
<td>voice, diminished capability of the brain, Decreased intellectual quotient, syncope, increased kabha condition</td>
<td></td>
</tr>
<tr>
<td>Loss of appetite, excessive salivation, diminished activity, heaviness, pallor, cold, decreased physical constituents, dyspnoea, Giddiness, dryness of the joints and prominence of bones.</td>
<td>Profuse sweating in the hair follicles.</td>
<td></td>
</tr>
</tbody>
</table>
Vizhi - If pitha humour is increased yellowish discolouration of conjunctiva occurs

1. Variations in the intake of Diet

Any material that provides the nutritive requirements to maintain growth and physical well being is called as food. Food containing six taste is to be taken by normal individuals.

In any alteration in the normal, regular diet will produce changes in the proportion of the uyirthathukkal, resulting in diseases. The following poem explains how humours are altered by the taste

"புஷ்கியான்அல்லாத் கார்கிக்கட்டாம் பாளாம்
சூரி வல்லாம் பைத்து இன்று செய்யவிட்டே
தர்க்கமில்லாம் செய்தே செய்தே செய்தே
தர்க்கமில்லாம் செய்தே செய்தே செய்தே"

- Sour (Pulippu), Astringent (Thuvarppu) - increases vatham
- Salt (uppu), Bitter (Kaippu) - increases pitham
- Pungent (Kasapu), Sweet (Inippu) - increases Kabham

2. Alterations in the Udal Kattukkal
When the three humours of the human body are affected by various factors they immediately change the nature of physical constituents

Udal kattukkal increased (or) decreased to produce a disease

<table>
<thead>
<tr>
<th>Udal Kattukkal</th>
<th>Increased features</th>
<th>Decreased features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Saaram (Chyle)</td>
<td>Loss of appetite, excessive salivation, diminished activity, heaviness, pallor, cold, decreased constituents, dyspnoea, flatulence, cough, excessive sleep.</td>
<td>Dryness of skin tiredness, Loss of weight, lassitude, Less ability in hearing.</td>
</tr>
<tr>
<td>2. Senneer (Blood)</td>
<td>Boils in different parts of the body, Spleenomegaly, tumours, pricking pain, Loss of appetite, haematuria, hypertension, reddish eye and skin, Leprosy, jaundice</td>
<td>Affinity to sour and cold food, Nervous debility, dryness, pallor.</td>
</tr>
<tr>
<td>No.</td>
<td>Condition (Type)</td>
<td>Manifestations</td>
</tr>
<tr>
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<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>3.</td>
<td>Oon (Muscle)</td>
<td>Tuberculous adenitis, Venereal diseases, extra growth around the neck, cheeks, abdomen, thigh, genitalia</td>
</tr>
<tr>
<td>4.</td>
<td>Kozhuppu (Fat)</td>
<td>Identical feature of increased Oon, tiredness, dyspnoea on exertion, extra musculature in genital region, external genitalia, chest, abdomen, thighs.</td>
</tr>
<tr>
<td>5.</td>
<td>Enbu (Bone)</td>
<td>Excessive ossification and dentition</td>
</tr>
<tr>
<td>6.</td>
<td>Moolai (Bone marrow)</td>
<td>Increased sexual activity, urinary calculi.</td>
</tr>
</tbody>
</table>
painless in the scrotum, inflammed and external genitalia.

Author is dealing about eye disease, the affected udal kattukkal are

(i) Senneer - Reddish eye
(ii) Moolai - Heaviness of eye

Blurred vision

3. Environmental Changes:

The environmental changes consists of two factors

(a) Seasonal changes of humours

(b) Regional changes of humours

(a) Seasonal change of humours

<table>
<thead>
<tr>
<th>Humours</th>
<th>Vatham</th>
<th>Pitham</th>
<th>Kapham</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mudhuvenil Kaar</td>
<td>Kaar Kalam</td>
<td>Pinpani Kalam</td>
</tr>
<tr>
<td>↑</td>
<td>Kaar kalam</td>
<td>Koodhir Kalam</td>
<td>Elavenil Kalam</td>
</tr>
<tr>
<td>↑↑</td>
<td>Koodhir Kalam</td>
<td>Munpani Kalam</td>
<td>Mudhuvenil Kalam</td>
</tr>
<tr>
<td>→</td>
<td>Koodhir Kalam</td>
<td>Munpani Kalam</td>
<td>Mudhuvenil Kalam</td>
</tr>
</tbody>
</table>

↑ - Thannilai Valarchi
(b) Regional Changes of Humours

1. Kurinji – Kapham resides there, abdominal Humours, Malarial fever may occur
2. Mullai – Pitha disease and predominant and vatha diseases also occur
3. Neydhal – Vadha disease with elephantiasis and inquinal hernia will occur.
4. Pallai – All these humours are disturbed and a lot of disease will occur.

**Effects of Self suppression of Fourteen Vegams:**

Reflexes are essential for normal physiology. When there is any self suppression to those reflexes that will lead to pathological state.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Vegams</th>
<th>Diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Vatham</td>
<td>Heart disease, gastritis, umbilical hernia, body pain, liver disorder, constipation, oliguria, loss of appetite.</td>
</tr>
<tr>
<td>2.</td>
<td>Thummal</td>
<td>Head ache, Defect of the special sensory organs and it activities, pain over the face, hipjoint pain.</td>
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<tr>
<td>4.</td>
<td>Malam</td>
<td>Diarrhoea caused by increased abanan, knee pain, head ache, flatulence, weakness and it leads to many</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>disease.</td>
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<tr>
<td>5.</td>
<td>Kottavi</td>
<td>Lethargic face, exhaustion, indigestion, urinary disorders, leacorrhoea associated with schizophrenia, abdominal disease.</td>
</tr>
<tr>
<td>6.</td>
<td>Pasi</td>
<td>All organs are affected, pricking pain all over the body, schizophrenia, emaciation, apathetic face, pain in the joints.</td>
</tr>
<tr>
<td>7.</td>
<td>Neervetkai</td>
<td>All organs are affected, pricking, pain all over the body, schizophrenia, emaciation, apathetic face, pain in the joints.</td>
</tr>
<tr>
<td>8.</td>
<td>Erumal</td>
<td>Increased cough, bad breath, heart disease.</td>
</tr>
<tr>
<td>9.</td>
<td>Elaippu</td>
<td>Urinary disorders, peptic ulcer, schizophrenia, rigor, identical features of suppression, sneezing.</td>
</tr>
<tr>
<td>10.</td>
<td>Thookkam</td>
<td>Heaviness of head, pain in the eyes, deafness, unclean speech.</td>
</tr>
<tr>
<td>11</td>
<td>Vanthi</td>
<td>Urticarial rashes, itching, anaemia, eye diseases, disease of increased pitham, asthma, fever, cough.</td>
</tr>
<tr>
<td>12.</td>
<td>Kanneer</td>
<td>Heart diseases, upper respiratory disorder, eye diseases, wounds in the scalp, peptic ulcer.</td>
</tr>
<tr>
<td>13.</td>
<td>Sukkilam (or)</td>
<td>Fever, anuria, joint disease of the upper and lower limbs, acute chest pain, increase urinary diseases.</td>
</tr>
</tbody>
</table>
The affected vegam in eye disease are

Thookkam – Pain in the eyes; Thummal – Pain in the sense organ; Kanneer – Eye diseases.

5. **Immunity status : (udal vanmai)**

Apart from food and climate conditions the disease affect an individual is also based on the immunity.

**Piniyarimuramai: (Diagnosis)**

In any system of medicine diagnosis is very important. Piniyarimuraimai is the method of finding out the disease.

The diagnosis is mainly based on the Envagai Thervugal. It is the unique and special method having a broad and important role in diagnosing the particular disease. It is based upon the following principles

1. **Poriyal arithal**
2. **Pulanal Arithal**
3. **Vinnathal**

**1. Poriyal Arithal:**

Understanding by the five organs of perception – nose, tongue, eyes, skin and the ears.
1. Mei – Skin
2. Vaai – Mouth
3. Kann – Eye
4. Mooku – Nopse
5. Sevi – Ear

2. Pulanal Arithal:

The physician knows about the patient nature place (Thinai), his condition, mode of living, diet and duration of his disease etc. If the patient is unable to talk (deaf and dump and other disease conditions) or if he is a child the particular about the disease are obtained from his relative or parents.

Envagai Thervugal:

“ததுத்து பரிவேத்திருக்கும் கைது விளை
மலர் விஞ்சிருந்தும் புணர்வாக்கப்படும்”

Envagai Thervugal are

1. Naadi (pulse)
2. Sparism (palpation)
3. Naa (tongue)
4. Niram (colour)
5. Mozhi (speech)
6. Vizhi (eyes)
7. Malam (stools)
8. Moothiram (urine)
1. Naadi:

The science of pulse is peculiar to siddha system of medicine.

The rhythmic expansion of an artery which may be felt by the finger which represents the state of function of the heart.

It serves as the reliable indicator of all diseases. If there is any imbalance in the normal proportion of uyirthathukkal, it is reflected through naddi.

Suitable place for the pulse reading

“தாதை முறை வெள் கரித்து விளி முதிப்பு
கதரு கரில்பந்தி சொள்ளைப்
ராணி வரலுறு காணல் கரா புரூட்டம்
முனை செய்திப் புகை பத்துற பார்த்தியல்.”

Even though Naadi can be felt on the above mentioned peripheral arteries, commonly the radial artery at the wrist is ideal for all people.

“முனைக்கு திறம் குண்டுத்துக்கு காதித்தியா
இவை விளிம்பு விளங்கும்போது
துன்றாக ஊடந்து வரி”

The gait of Naadi is compared with the gait of animal, reptiles and birds.

Vatha Naadi – Movements of Swan and hen.

Pitha Naadi – Movements of tortoise and leech.

Kabha Naddi – Movements of frog and snake.
In Naadi purudan and Kaanthari are affected

Purudan :

Lies in the right eye

Kaanthari :

Lies in the left eye

2. Sparism (palpation)

Sparism is the temperature of skin (heat and cold), smoothness or roughness, sweat, dryness, hard patches, swelling, enlargement of visceras, tenderness and nourishment can be felt.

3. Naa (tongue)

By the examination of the tongue its colour, coating, dryness, speech, redness, ulceration, pallor, excessive salivation, predominant taste in the tongue, any malignant growth and movements of the tongue can be noted.

4. Niram (colour)

Diagnosis made with the help of the colour of the skin, nails, hair, conjunctiva, teeth, mucous membrane etc.

5. Mozhi (speech)

In the examination of mozhi, the pitch of voice (low or high), loudness of voice, slurring speech, speech in hallucination, aphasia should be noted.
6. Vizhi (eye)

By the examination of vizhi, redness, yellowishness, pallor, dryness, lacrimation, sharpness of vision, response of pupil, condition of hair in the eye should be noted.

7. Malam (faeces)

In the examination of the malam, note its nature, whether it is solid, semisolid or liquid, colour, smell, quantity, odour should be noted.

8. Moothiram (urine)

In the siddha system of medicine changes of urine observed with in two peculiar studies, they are

   I. Neerkuri
   II. Neikuri

I. Neerkuri:

Physical findings of urine are said as

"நீர்குரி பெருந்தகரியும் மத்தூரியும் பரதென்சுகள்

நீர்த்திலையான பொருட்கள் பலனூடு"

According to this verse colour, quantity, odour, frothy appearance, deposits, specific gravity are to be noted.
II. Neikuri:

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

The siddhars followed 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 doshas in equilibrium and maintenance of the seven thathus. So proper diet, medicine and adjuvant and the regimen of the life are advised for the healthy living and to restore equilibrium of doshas in increased or decreased conditions.

The diseased condition body shows many signs and symptoms. To diagnose the disease and choose the correct medicine the physician must have the knowledge of the pathology of the disease. It is essential for the correct treatment of the patient.
AIM AND OBJECTIVES

Eye diseases are increased in alarming rate now-a-days due to

- increased premature ageing
- life style modifications
- global warming
- recent industrialisation
- over usage of computers and electronic devices
- improper methods of safeguarding eye
- dramatic change in dietary regimen etc.,

Among 96 Siddha eye diseases. Most of them are premature ageing related disease.

The principle Aim is to evaluate the pathology of ‘Naga Padalam’ and to collected & review the view and ideas of the siddhars about this disease

a) Naga padalam is common in India and world wide distributed more prone in Equatorial regions

b) Common in all age groups but have higher incidence in aged ones

c) Uncontrolled persistence of disease worsen the vision and corneal astigmatism results.

Having these features in mind. The following objectives are enumerated.
Objectives

Survey of siddha literature

a) Siddha physiology

b) Collection and detailed study of various eye books, regarding Nagapadalam

Also dealing with definition aetiology, classification, signs and symptoms of disease, aggravating factors fate of the disease, line of treatment and diet interaction

- To expose the efficacy of siddhar diagnostic and surgical principle
- To list out incidence of the disease, with reference to Age, Sex, location, climates (paruvakaalam) the land in which the patient exist
- To know and corelate the features of Naga padam with that of modern aspects
- Diagnostic methods of Nagapadalam
- Importance of eye is an diagnostic tool
- To list out the relation of the disease with occupation, and his exposure to radiation

Preventive methods and controlling procedures of eye disease
INTRODUCTION TO EYE DISEASE

According to ancient saying,

“¸ñ½¢ü º¢Èó¾ ¯ÚôÒ þø¨Ä.”

We can come to an idea about the importance and peculiarity of eye.

Also among the 5 sense organs eye is considered to be the best, and it is compared to ones "Intelligence".

According to V.R. Madhavan the author of ophthalmology in siddha medicine Kanmani of eye is compared to God by many of siddhar's.

History:

Even though, concept of eye have gained importance in stone age and bronze age, it was regularised. Only during the regime of ‘King Hamarabi’ the ruler of ‘Babilona’.


In India, Father of surgery Sushuratha and Dharmendra had done eye surgeries.

During their, period the couching method of removing cataract have been in practice.

Management of Eye disease

i. Maanida Maruthuvam (Medical Treatment)

ii. Asura Maruthuvam (Surigical Treatment)

Eye disease is being cured by the above said methods.
Eye Inspecting Instrument

Buddhist scholar Helmhattz (1821 - 1894) invented an eye surgical instrument in 19th century to analyze the various diseased condition of the eye.

Related Terms

1. கண்ணியமைச்சிறியம் - Conjunctiva
2. கோர்நைல் - Sclera
3. கருவைக்குறிப்பிட்டுதல் - Cornea
4. கட்டுமானங்கள் - Iris
5. கார்புரை - Ciliary body
6. காரைக்காளம் - Retina
7. செம்சு - Lens
8. கொரேகோம் - Aqueous Humour
9. Vitreous humour

- कुत्सत बलम - कुत्सत बलम विनिमयम अस्तित्व.
- ताहराहरुबालम - ताहराहरुबालम, भक्तिम, भक्तिक्रियां भर्ति संबंधित
- कलिसम - कलिसम
காலைத் பேச்சு

காலைத் பேச்சு விளக்கம் காண்பதற்கான விளக்கம்

அதிகம் பேச்சு அளிக்கவும் விளக்கம்

நூறு பேச்சு விளக்கம் வெளிப்படுத்துவதற்கு விளக்கம்

காலைத் பேச்சு விளக்கம் மேல் பதிவு

காலைத் பேச்சு விளக்கம் வெளிப்படுத்துவதற்கு விளக்கம்

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காலைத் பேச்சு விளக்கம் மேல் பதிவு
The dissertation topic of author is Nagapadalam among 96 eye diseases.
CLASSIFICATION OF EYE DISEASES - AGATHIYAR’S VIEW

According to siddhars tamil Medical science, the eye diseases are brought under three general classifications with regard to the three humours in the human system. They are sub-divided into 96 different kinds as follows.

- Deranged Vatha - 45
- Deranged Pitha - 31
- Deranged Kaba - 29

The above said 96 diseases are the eye as shown under:

- Lens - 27
- Binding unions - 9
- Black of the eye - 10
- Eye lids - 24
- White - 13
- Eye ball - 13

The poem which is believed to be original containing the names of 96 diseases are quoted as an authority.

The descriptive names of the 96 diseases enumerated in the said verses of the prologue to Agasta’s 500 on diseases of the eye are:

In tamil medical science compiled by Nagamuni, the diseases of the eyes are divided into 96 kinds and according to the four regions of the eye, they are classified as shown under:
I. Diseases of the black of the eye - 45

[Including the cornea, choroid, Iris, retina, Pupil, lens and the vitreous body]

II. Diseases of the white of the eye (Sclera) - 20

III. Diseases of the eyelids - 16

IV. Diseases of the angles of the eye - 15

I. Diseases of the black of the eye.

a. Kasam - 8
b. Padalam - 7
c. Kumudam - 3
d. Vizhiundhal - 3
e. Kundam - 3
f. Timiram - 7
g. Vari - 3
h. Sukkiran - 5
i. Nerisal - 3
j. Poo - 3

a. Kasam (diseases of the lens)
b. Padalam (diseases of the several coats (or) Films over the pupil)
c. Kumudam (Morbid growth of flesh over the pupil)
d. Viziundal (spreading growth on the cornea)
e. Kundam (protrusion of the eye ball)

f. Timira (loss of vision)

g. Vari (streaks or lines on the cornea)

h. Sukkiran (white film or fleshy growth on the choroid including the iris or the white speaks on the black of the eye)

i. Nerisal (Pressure due to swelling of the eyeball)

j. Poo (cataract)

II. Diseases of the white of the eye (sclerotic coat)

a. Eluchi (tubercle)

b. Padarthi (film)

c. Nerisal (Pressure due to swelling or enlargement)

d. Putru (abnormal growth (or) swelling with punctures or sinuses)

e. Kumilam (red boils)

f. Vari (streaks (or) lines)

III. Diseases of the eyelid

a. Pillam (blepharitis)

b. Parparoga (Morbid softening)

c. Kalalai (tumor)

d. Tadippu (thickenning)

e. Mudamayir (trachiasis)

f. Izhichakkan (inability to close the eyelids)

g. Imaineerpaichal (lacrimation)
h. Sutrukulaivu (ulceration)
i. Puzhukkadi (Madarosis)
j. Imayiraichi (entropion)

IV. Diseases of the corners or angles of the eyes (inner and outer)

a. Padarthi (Filmy growth)
b. Kuvai (conical shaped growth)
c. Kannokadu (frequent swelling)
d. Poosandram (tubercle)
e. Vizhivadham (paralysis)
f. Viranaparu (wart in the edge)
g. Vuipuruthi
h. Immaikkuru (stye)
i. Kumil (Membraneous growth)
j. Nethravayu (ptosis)
k. Kanno (inflammation)
PADALAM

பலன்

"இப்போது பலன் இருபது மூவாய் தாமூஸ் பார்வேயர்
குறிப்பிட்டு முதல் முழு ஒருப்புச் சென்று பலன் மறண்டு
நேர்முக பலன் முன்பு பார்வேயர் பலன் வணக்கி
முக்கியமான மகிழ்ச்செய்க் பலனைக் குறுக்கும் பின்’

"கருப்பட்ட பார்வேயர் பார்வேயர் கருப்படும் பலன் இயக்கி
குறிப்பிட்டு முதல் பார்வேயர் பலன் இயக்கி
நேர்முக முக்கியமான மகிழ்ச்செய்க் பின்’
சேர்த்து தற்போது பார்வேயர் குறுக்கும் பின்’

"தூரவிலை குறுக்கும் குறுக்கும் பின்’"
- Sathai padalam
- Neer padalam
- Raththa padalam
- Vari Eluchi padalam
- Athi Mangisha padalam
- Pasu vizhi padalam
- Karunaga padalam

- Nagapadalam
- Raththa padalam
- Neer padalam
- Vellai padalam
- Panju Neer padalam

**Curable padalams**

- Sathai padalam
- Raththa padalam
- Neer padalam
- Vari Eluchi padalam
Cauterize the middle nerve which supplies the eye, by the eye surgical instrument *Madangal*

Then treat the ulcer caused by cauterization, symptomatically
SURGICAL PROCEDURE FOR NAGAPADALAM

காத்தூண்டு நீரிஞ் திகழ்வு

குதிற்றி மிலியோ காத்தூண்டு நீரிஞ் திகழ்வு

பதிலும் ஊர்வண சுருக்க முதலியில் எண்கலை

2 ஊர்வண சுருக்க சுருக்க நீரிஞ்சுவரம் கொண்டுள்ள சுருக்க

பதிலும் முழு முதலியோர் நீரிஞ்சுவரம் வேட்டுப்படுத்தும்

சுருக்க ஊர்வண சுருக்க நீரிஞ்சுவரம் வேட்டுப்படுத்தும்

சுருக்க ஊர்வண சுருக்க நீரிஞ்சுவரம் வேட்டுப்படுத்தும்

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சுருக்க ஊர்வண சுருக்க நீரிஞ்சுவரம் வேட்டுப்படுத்தும்

சுருக்க ஊர்வண சுருக்க நீரிஞ்சுவரம் வேட்டுப்படுத்தும்
"The Head of Pterygium encroaches the pupil"

"It runs over the Sclera as equal proportion to the thickness of the red thread.

"By the eye surgical instrument vilisam excise the pterygium very carefully without affecting the cornea"

Vilisam - An eye surgical instrument used in Siddha medicine to excise the pterygium

Tooke’s knife - An eye surgical instrument used in Modern Eye surgeries to excise the pterygium

POST OPERATIVE TREATMENT PROCEDURES

a) Compressing eye with bandage soaked in cows ghee

b) Instil cows ghee

c) Tender leaves of Tamarindus Indicus Poola ver Grind both of these drugs with honey mix the above preparation with equal amount of Mother’s milk

d) Instil the above said preparation into the excised eye
According to Sambasivam Pillai dictionary

Padalam: Milky white opacity of the cornea due to filmy growth on the sclerotic coat of the eye. It may also affect any of the four coats, layers of films of the eye

First coat is anterior coat

The second choroid.

The third is sclerotic and cornea

The fourth is retina (Dristi)

It consists of different kinds as follows

1. Kannuru padalam – Opacity of cornea & the lens
2. Karuppu padalam – Inflammation of the cornea – Keratitis
3. Vellai padalam – Inflammation of the white of the eye.
4. Udhara Padalam – Reddish growth

Features of normal eye

“பூம்பகிதீரையில் பிளமை வசதி விளைவுகளுக்கு பதியும் பூம்பகிதீரையில் ஒரு வசதி காரியமுடன் கலன்வகையில் கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படியுடன் கூட்டும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படியுடன் கூட்டும் படியுடன் கூட்டும் படியுடன் கூட்டும் படியுடன் கூட்டும் படியுடன் கூட்டும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும் படி கருநிலம் சுழ்க்கும்
Agathiyar describes about Normal Eye as follows

Sclera and Conjuctiva must be clear as padigam (Alum)

Examiner’s image must be seen on visualized eye.

Clear Pupil

Dimensions of Eye

"பாற்றியில் பிடிப்பில் நோக்கு பக்கத்து மற்று காண்டார்

பொய்க்கு தோன்று நின்றதான் விளக்கம் குன்றுக்கு கொண்டு

அமரங்க விளக்கத் விளக்கு பல்புலையான முளையாகவும்

செம்மான் பிடிப்பில்லாதது கொச்சித்தியாக்காக கிளித்தி செய்யாது""

<table>
<thead>
<tr>
<th>Length of the Eye</th>
<th>-</th>
<th>2 inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breadth of the Eye</td>
<td>-</td>
<td>½ inch</td>
</tr>
<tr>
<td>Depth of the Eye</td>
<td>-</td>
<td>1 inch</td>
</tr>
</tbody>
</table>

Proportion of Eye organs

"சமன்பல்காலத்தில் பல்காலத்து குண்டுக்கு பிடிப்பில் பெருமா

பல்புலையான பொய்க்கு பல்காலத்து பிடிப்பில் பெருமா

சூழலிலான இருள் விளக்கு பல்புலை குன்றுக்கு மேலும்

ஆயிர்க்காலம் பல்காலத்தின் குண்டுக்கு பல்புலையான செய்யாது செய்யாது""

Black portion       - 1/3 of the eye ball
Pupil               - 1/7 of the cornea
Level of vision based on their ages

Till 35 years : no change in vision
35 - 45 years : Cloudiness or Blurring of vision
45 - 57 years : Haziness of vision
57 - 100 years : Total blindness

Rules for taking medicine

Purgative medicine - At morning
Emetic medicine - within 3 hrs of sun rise
Nasal drops - Within 24 minutes of sun rise
Eye drops - Before sunset (Wise at evening)

சாற்றின் வேலைச் செய்யும் போட்டிகள்

மாற்றிய சுருக்கு காலம் பார்ப்பதற்குப் பித்தலுள்ளது

மாற்றிய கைத்துணிகள் மாறு காட்டும் போட்டியில்லை

தோற்றம் மாறு குருப்பு மேலறை நிற்பது பெற

பாலித்த குழ்தைகள் கண்டுசேரித்தும் புதிதையோ சமர்த்தக்கால்
Application of eye medicine

Aani, Iyppasi, Karthigai - Morning
Margali, Thai, Masi, Panguni - Day time
Sithirai, Vaigasi, Aadi, Aavani, Puratasi - within 18 Nazhiligai

Application of eye medicine is recommended for 2 times in the morning and evening. If one time advisable evening is the best.

Eye medicine should not applied after sunset.

Surgical procedure of the eye should be done in the morning and leech therapy in the evening.

Contraindicated days

“கார்த்திகை சாஸ்திரம் காசை லேன்சும் புஏகம்
சித்ரா வாயகா சித்ரா பாளியம் கோத்து
வாங்கு பருட்பல்பன போர்க்காள மறுக்கியல்
கார்த்திகை சாஸ்திரம் லேன்சும் காசை லேன்சும் சல்பு போர்க்காள”
Contraindicated timings for application of Eye medicine

1. During rainy season
2. After taking oil bath
3. During menstural period

Factors which are responsible for the eye diseases in Intra uterine life

1. Altered food habits
2. Excessive drug intake
3. Excessive thirst and hunger
4. Intake of mangoes
5. Parasitic infections in pregnant mother

Also,

- Walking for a long distance
- walking without chappals
- distrubed sleep
- Visualizing lightining , fire
- Consuming vinegar during drug Intercated periods
- Living in Excessive wind areas
- Lifting heavy weights in head
- Habitual consumption of beetel leaves

- Increased body temperature.
- Taking oil bath after roaming in sun light.
- Inhaling camphor, Michelia chenbaga, fumes

“இறைவில் விளைந்த காச்சு என்பது செல்வலூண்டிகள் காச்சன்கள்
இறைவில் விளைந்த காச்சன்கள் பற்றிகொள்ள கூறுகள் காச்சன்கள்
பற்றிய காச்சு பற்றிய தொன்மை பற்றிய காச்சன்கள்
பற்றிய காச்சு பற்றிய தொன்மை காச்சன்கள் பற்றிய”

- Due to lack of sleep
- Sleeping in sitting posture
- Intake of Alcohol and Beverages
- Increased or chronic exposure to wind
“Depression
- Accumulation of faecal matter in large intestine
- Performing work in head – down position

Increased intake of water
- Increased dryness of body
- Visualizing lightening

Consuming food particles mixed with stones and hair
- Habitual beetel chewing
Preventive measures

- Vomitting: Pitham thanillai
- Purgation: Vatham thanillai
- Nasal drops: Kabam thanillai
- Eye Application: Improves the vision

Brushing with stems of banyan (or) Jack fruit (or) Accacia
இல்லைப் பார்க்கவும்

“கால்வித்து கன்றணங்க் தேக்கட்டுக் குந்து பங்களிைய நிற்கில்
துவேப்பு என்று என்று என்றும் விளக்கமிட்டு பார்க்க
மீனத்தாரா பல்லத்து என்றும் என்றும் கந்தகாண் பின்னால்
துவேப்பு நில்லாம் குறுக்கு தேர்வு பிள்ளை போர்த்திலைப்படும்”

Arrange the fingers as palagani and see the moon for few minutes through the window. Then wash and give gentle massage to the eyes.

அமிர்த யோகம்

“மன்னுக்கு கதுலிய பிள்ளை என்றும் என்று
மீனத்தார் குந்து பங்களிைய நிற்கில் துவேப்பு
சாக்குடாகக் குந்து பங்களிைய நிற்கில் பார்க்க
பங்களிைய நிற்கும் தேர்வு என்றும் அமிர்த யோகம்”

Instil three drops of pure water in to the eyes in the night and gently massage the eyelids and see the moon, this method is called “Amirthayogam”

நூற்று பற்றிகள்

“நூற்று பற்றிகள் தேர்வுகள் மாணிக்கார் சிற்றிகள்
பார்க்கால் கருத்தி சிற்றிகளாக பார்க்க பாரும் தேர்வுப் புரவங்கள்

54
Hygienic measures to prevent eye diseases

1. Regular intake of green leaves
2. Intake of milk products like ghee, milk etc., at least twice a day
3. Brush regularly

If there is any discomfort in eye, apply ghee in the sole and wash with water then apply sandal paste to the foot.

Kayakalpa Drugs

Common & Special Kaya Kalpa drugs to prevent & cure Eye disease

பதிக குறும்

பிற்பக்கான பிற்பக்கான வயதான பிற்பக்கான
குறுக்குற்றம் பார்வோன்றுக்கு காரணம் - வீரபாலி

கிரிநாதர் தேசவிபத்து பேசியிருக்கிறார் பிறந்தவர்

மதசங்கம் மீது பாடி”

கால்புக்கில் முன்னை

பிறந்த முன்னை

செய்யப்பட்டிருக்கு

குறிக்கொள்கிறார்

ஒற்றுடையோப்பு

தொல்பருக்கள் காரணப்பட்டின் பல மிளகுற்றுக்கு விளக்கமிகுகை காட்டுவதற்கு, புராண, அரசன் துறைமுதல், ஐயன்வர காரணப்பட்டின் சான்று சிற்றூராக புராண புரைக்கு விளக்கம்.

2. பகுதியும் என்று:

கால்புக்கிலே சொல்லாம் பிறந்த குறுக்குற்றம் விளக்கத்துக்குத் தமிழ் இழுத்துச் சொல்லாம் காரணம், என்பது, அரசன் துறைமுதல், ஐயன்வர காரணப்பட்டின் சான்று சிற்றூராக புராண புரை�்கு விளக்க செய்ய. அவைகள்: கிரிநாத தேசவிபத்து - கிரிநாத

மத. அறு. கிரிநாதர், கால்புக்கில்.
READING LINES BETWEEN AGATHIYARS POEM

- A triangular shaped area
- A filmy layer (or) growth

"கடல் கனள் என்பண்பத்தில் காட்சியை கிளம்புத்திப்பாவேம்"
- இது கடல்கனளிலுள்ள கிளம்பு அடைகிறது கவனம் பார்க்கு காட்சியை

"நிலையச்சாது பேலையுள்ள விளையாட்டு கிளம்பாவில்"
- நிலையச்சாது காட்சியை பேலையுள்ள பேலை கடல்கனள் கிளம்பில் விளையாடை
  காட்சியை கிளம்பாவில் பார்க்கும்

"அடைகிறில் மிகிலான காட்சியை அறியாதிர் கிளம்பாவில்"
- மிகி அறியாது கடல்கனள் பேலையுள்ள மாற்றமான அறிகிறில், அறியாத கிளம்பாவில்

"நுட்பம் குழுப்பானாரா புண்ணகம் பலமார்"
- திண்டுக் குழுப்பானார் புண்ணகார் கிளம்ப பார்க்கும் கிளம்பாவில்.
DETAILED PATHOLOGICAL VIEW OF THE

DISSERTATION TOPIC

NAGA PADALAM

"கால்காலம் தசையம் துக்கில் கனடாவின் கீம்புக்கு சரணாகின
தப்பூச்சத் வகையான நகரில் நிறக்கத்தில்
அவ்விகிடத்துக்கு முன்வேயான அதிகரித் திகழப்பட்டார்
தென்பு கனடா என்றவர்கள் நகரக்கு பல்வேறு வாசிதிருந்தனர்.

Agathiyar describes Naga padalam in the poem 24

ஆராய்ச்சிகள் (a) - கால்காலம் தசையம் ராத் மாற்று தென்கிைனாம்.

An eye disease in which a film is formed over the pupil of eye

கால்காலம் - The outer or the inner corner (canthus) of the eye

a) Temporal

b) Nasal

ஆராய்ச்சிகள் (b):

ஆராய்ச்சிகளில் தசையன் அதிகாரிகள் குறுக்கு ராத் மாற்றுக்கு தீர்ந்து கொண்டு
அவ்விகிடத்துக்கு பல்வேயான தீர்ந்து கொண்டு பராமரிப்பு தென்கிைனாம் என காட்டு
கனடா அப்போனின் உடன் என்ற கனடாக்களை பார்க்கவேண்டும்.

An eye disease characterised by inflammation of both eyes choroid coating or film spreading over the pupil and thus affecting the eye sight by covering the cornea. It is marked by discharge of water from the eyes followed by itching
The outer and the inner corner of the eye

a) Temporal

b) Nasal

Redness of the Eye (mainly due to conjunctivitis or inflammatory changes)

Conjunctivitis (Redness of Eye) Inflammatory condition of conjunctiva. Conjunctiva has two layers. Epithelium and sub-epithelium. Irritation of the conjunctiva from any cause, whether infection, allergy or mechanical trauma results in congestion of the superficial blood vessels, run perpendicular to the superficial plane of vessels. So as to protrude into the epithelium as vascular tufts. Growth of elastic tissue from the sub epithelial layers forming around these vessels causes the papillae which are constant findings in all types of conjunctivitis.

Hyperplasia of the lymphoid tissue of the sub-epithelial layer may result from conjunctival irritation.

There is usually some hypertrophy of the epithelium in inflammation of the conjunctiva and there is increased desquamation of the superficial layers.
Which is, partly the cause of mucopurulent discharge from the conjunctival sac.

Throughout the course of an attack of conjunctivitis many inflammatory cells are present in the sub-epithelial layers. They are lymphocytes, plasma cells, histocytes or polymorphonuclear leucocytes. The setting of the inflammatory process is followed by the absorption of these cells

"ஒரு கோயில் குளிர் நாட்டு வாழ்த்து வெள்ளை கரிமு குழியின்

திப்பாணி - ஒரு த்ராண்ணம் சமாள் பில்லிச் செயலாளர் இருக்கிறார், இது progress to pupil as the days go, and hides.

PATHOGENESIS OF THUDAISATHAI

Numerous theories have been postulated for the pathogenesis of pterygia, including choline deficiency, inflammation degeneration tissue angiogenesis factor; changes in the elastic tissue and immune mechanisms.

One theory is that tear film abnormalities cause drying of the cornea and conjunctiva, which in turn predispose to new growths. This theory has been supported by studies of geographical distribution, i.e., pterygia appear to occur more frequently in hot, dry climates.
Ultraviolet irradiation been suggested as being a major environmental disposing factor in primary pterygia. Ultraviolet light causes mutations in both UV-sensitive TP53 tumor suppression genes in the parental limbal basal cells and the elastin gene of the fibroblasts in the limbal epithelium, mutations in other genes are progressively acquired. This allows the multistep development of pterygium and limbal tumor cells from P53 expressing limbal epithelial cells. These cells overlie pinguecula of the altered fibroblasts that make abnormal elastotic material and express various Matrix Metallo Proteins (MMPs).

Mutations in the TP53 gene family in the parental limbal basal cells also result in the overproduction of TGF-β by the pterygium cells. Excess TGF-β secretion by the pterygium cells can explain tissue changes and MMP expressions seen in pterygia.

First, pterygium cells (altered limbal basal epithelial cells) produce elevated MMP-2, MMP-9, MT1-MMP, and MT2-MMP, causing dissolution of hemidesmosome attachments. Initially, the pterygium cells migrate centrifugally in all directions onto the adjacent and joined corneal, limbal and conjunctival basement membranes. Because of the TGF-β production of these cells, they have a reduced number of cell layers and no tumour mass is seen, resulting in an invisible tumour.

Later, after an entire group of altered limbal basal cells develop and all hemidesmosomes are dissolved under these cells, they migrate as a suppressed growth onto the cornea followed by conjunctival epithelium, expressing all 6 MMPs and contributing to the dissolution of Bowman’s layer. In addition, TGF-β synthesized by the pterygium cells causes increased monocytes and capillaries within the epithelial and stromal layers.
Second, a group of normal fibroblasts gather under the invading limbus epithelium next to the dissolved edges of Bowman's layer and are activated by a TGF-β bFGF pathway to produce excess MMP-1 and MMP-3 as they help to dissolve Bowman's layer. Some of these cytokine activated fibroblasts migrate anterior to the leading edges of pterygia between Bowman's layer and the basement membrane of the corneal basal cells to form little islands of fibroblasts that make MMP-1 and locally help to dissolve Bowman's layer. 

Pterygium pathogenesis. Corneal invasion by matrix metalloproteinase (MMP) expressing altered limbal epithelial cells and CJ indicates conjunctiva with goblet cells infiltrated by pterygium cells: 

DBL, dissolved Bowman's layer; 
F1, fibroblasts making abnormal elastotic material (the pinguecula tumor): 
FII, fibroblasts making collagen and possibly elastic materials; 
FIII, fibroblasts making MMP-1 at dissolved edge of Bowman's layer; 
FIV, fibroblasts (fibroblast islands) making MMP-1 at dissolved edges of Bowman's layer; 
G, goblet cells; 
ML, migrating limbus; 
MMP B, MMP expressing altered limbal basal epithelial cells invading cornea and conjunctival epithelium; 
V, blood vessels (angiogenesis)

- Watering of eyes
- Itching of the eyes
These are the clinical features of the Naga padalam
EVALUATION OF DISSERTATION TOPIC

Materials And Methods

The study on Naga padalam carried out at PG Noi Naadal OP department of Government Siddha Medical College Hospital Palayamkottai and at Aravind eye hospital Tirunelveli.

Case selection and supervision

20 Cases of similar clinical presentation of Naga padalam were taken from Government Siddha Medical College Hospital Palayamkottai and at Aravind eye hospital Tirunelveli.

Among them 20 cases of Naga padalam were selected and dissertation work was properly undergone by the author whose work was under close supervision of the Professor and Lecturer of PG Noi nadal department

Evaluation of clinical parameters

- *Detailed history of present and past illness*
- *occupational history*
- *Personal history*
- *Socio economic history*
- *Dietary habits*
- *Seasonal variations*
- *Environmental changes*
Above said parameters were carefully scrutinized by the author. The clinical signs and symptoms were taken from Aathiyar nayana viti 500

**Symptoms and Signs of Naga padalam**

- Irritation
- Redness
- Swelling
- Watering
- Grittiness
- Diplopia

**Study on siddha clinical diagnosis (Piniyarimuraimai)**

- Modes of investigation by siddha methods
- Poriyaalarithal
- Pulanaalarithal
- Vinaathal
- Mukkutra nilaigal
- Udal kattu nilaigal
- Envagai thervugal
MODERN INVESTIGATIONS

For further study about the disease the following investigations were undergone in all the cases.

Haematological Parameters

- T C
- D C
- E S R

BIOCHEMICAL FINDINGS

- Blood urea
- Blood sugar (F / PP / R)
- Serum creatinine

URINE ANALYSIS

- Alb
- Sugar
- Deposit

SPECIAL AND SPECIFIC TEST

- Histopathological findings
- Corneal Topography
  - Orb Scan
OBSERVATION AND RESULTS

Results were observed with respect to the following aspects.

1. Age and Sex reference
2. Onset of the disease
3. Seasonal variations
4. Socio-economic status
5. Mukkuttram
6. Udal kattugal
7. Signs and Symptoms
8. Envagai thervugal
9. Laboratory Investigation
10. Culture test

Age reference

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<thead>
<tr>
<th>Sl. No</th>
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<tbody>
<tr>
<td>1</td>
<td>30-50</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>50-70</td>
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<tr>
<td>3</td>
<td>70-90</td>
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Most of the patients under study belonged to Pithakaalam (34-66)
### Sex

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<td>2</td>
<td>Male</td>
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### Eye affected

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<tr>
<td>1</td>
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<td>4</td>
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<tr>
<td>3</td>
<td>Both Eye</td>
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## Seasonal Variations

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<tbody>
<tr>
<td>1</td>
<td>Kaar</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Koothir</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Munpani</td>
<td>-</td>
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<tr>
<td>4</td>
<td>Pinpani</td>
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<tr>
<td>5</td>
<td>Ilavenil</td>
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</tr>
<tr>
<td>6</td>
<td>Mudhuvenil</td>
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## Socio-economic status

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<tr>
<td>2</td>
<td>middle</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
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Distribution of Mukkutram

Vadham

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<td>Pranan</td>
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<td>3</td>
<td>Viyanan</td>
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</tr>
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<td>4</td>
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<td>6</td>
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<tr>
<td>7</td>
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<td>8</td>
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<td>Dhananjayan</td>
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## Pitham

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<tr>
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<td>Ranjagam</td>
<td>-</td>
</tr>
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<td>Saadhagam</td>
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<td>Praasagam</td>
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## Kabam

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Udal Kattugal

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Clinical presentations

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<td>Envagai thervu:</td>
<td>No. of cases affected</td>
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<td>2</td>
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<tr>
<td></td>
<td>Pitha kabam</td>
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THEORITICAL VIEW OF DISSERTATION TOPIC IN MODERN ASPECTS

Embryology of Eye

The CNS is developed from the neural grove, which later invaginates to form the neural tube & runs down the dorsal surface of the embryo.

At either side of the anterior portion neural tube a thickening appears at early stage, which is known as optic plate.

The optic plate later on develops as optic vesicle. As the optic vesicle meets the surface ectoderm, optic cup is formed and the invaginated surface ectoderm is converted into the lens. The inner layer of the cup forms Retina . The mesoderm surrounding the optic cup differentiates to form the coats of the eye and the orbital structures such as

1. Anterior layer of iris
2. The angle of the AC (Anterior Chamber)
3. Main structures of cornea, Whereas surface ectoderm remains as corneal and conjuctival epithelium

The surrounding regional folds grow over infront of the cornea to form the lids

**The eye is essentially formed from both Ectoderm and mesoderm**

The ectoderm is of 2 types

i) Neural ectoderm derived from neural tube

ii) surface ectoderm derived from side of the head

(Embryology diagram)

**OCULAR EMBRYOGENESIS**

<table>
<thead>
<tr>
<th>PERIOD AFTER CONCEPTION</th>
<th>MAJOR MILE STONES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3weeks</td>
<td>Optic groove appears</td>
</tr>
<tr>
<td>1Month</td>
<td>Hyaloid vessels develop</td>
</tr>
<tr>
<td>9th week</td>
<td>Migration of waves of neural crest</td>
</tr>
<tr>
<td>3rd month</td>
<td>AC forms</td>
</tr>
<tr>
<td>7th month</td>
<td>Myelination of optic nerve begins</td>
</tr>
<tr>
<td>8th month</td>
<td>AC angle forms</td>
</tr>
<tr>
<td>9th month</td>
<td>Retinal vessels reach temporal periphery</td>
</tr>
<tr>
<td>After Birth</td>
<td>Macular Region of the retina develops</td>
</tr>
</tbody>
</table>

**Primordia Tissue and its derivations**
## PRECURSOR | DERIVATIVES
---|---
Neural Ectoderm | Retina fibres of optic nerve smooth muscles of iris.
Surface ectoderm | Corneal & conjunctival epithelium lacrimal glands, Tarsal glands, lens.
Mesoderm | Extraocular muscles, sclera, iris
Neural crest | Orbit bones, ciliary muscle, sclera corneal stroma

### BASIC HISTOLOGY

Four important tissue in our body are

A. Epithelia Tissue Disserve Tissue
B. Connective Tissue Muscle Tissue
C. Muscle Tissue
D. Nerve Tissue

### Epithelia tissues

- Closely aggregated polyhendral cells with little intercellular substance
- Principle function of Epithelial tissues
  - Covering & lining surfaces (skin)
  - Absorption (intestine)
  - Secretion (glands)
  - Sensory (Neuro epithelium)
  - Contractive (myoepithelial)
General characters of Epithelium

No interstitial space

Presence of a Basal lamina

Specialization of the cell surface

- Microvilli
- Cilia and flagella

Connective Tissue

It is composed of fibres

Connective Tissue is characterised morphologically by the presence of several types of cells immersed in abundant intercellular material synthesised by these cells.

Richness intercellular material is one of the main characteristics of connective tissue

Connective Tissue is composed of fibres and matrix (amorphous intercellular substance)

Cells, fibres, amorphous, substances are embedded.

3 main types of CONNECTIVE TISSUE fibres

Collageous  Elastic  Reticular

Connective Tissue makes up tendon, ligament and the aerolar tissue that fills the spaces between organs Bones & Cartilages.
**Collageous fibres**

Most numerous fibres in Connective Tissue

Collageous fibres are composed mainly of a sclero protein called collagen, whose principal acid is glycine, proline and hydroxyproline

**Elastic fibres**

Elastic fibres are easily distinguished from the collagenous fibres

Because elastic fibres are thinner and do not have longitudinal striations

**Cells in connective tissue**

- Fibroblasts
- Macrophages
- Mast cells
- Plasma cells
- Leukocytes

**Lamina Propria**

The connective tissue layer of the mucous membrane

**HUMAN EYE HISTOLOGY**

**The Conjunctiva**

The conjunctiva is a thin transparent membrane which covers the inner surface of each eyelid (palpebral conjunctiva) and the anterior part of the sclera (ocular conjunctiva). At the free margin of the eyelid, the palpebral conjunctiva
becomes continuous with skin and at the margin of the cornea the ocular conjunctiva becomes continuous anterior epithelium of the cornea. When the eyelids are closed the conjunctiva forms a closed conjunctival sac.

The line along which palpebral conjunctiva reflected onto the eyeball is called the conjunctival fornix superior or inferior. The ducts of the lacrimal gland open to the lateral part of the superior conjunctival fornix. Lacrimal fluid keeps the conjunctiva moist. Accessory lacrimal glands are present near the superior conjunctival fornix.

Conjunctiva consists of an epithelial lining that rests on connective tissue over the eyelids. This connective tissue is highly vascular and contains much lymphoid tissue. It is much less vascular over the sclera.

The epithelium lining the palpebral conjunctiva is typically 2 layered. There a superficial layer of columnar cells, and a deeper layer of flattened cells. At the fornix, and over the sclera, the epithelium is 3 layered there being an additional layer of polygonal cells between the two layers mentioned above. The three layered epithelium changes to stratified squamous at the sclerocorneal junction, to form as ‘Cornea’

_Histology of Organ systems – Leeson & Paporo_
According to Leeson and Paporo
The conjunctival epithelium varies with location. It consists of a basal layer of cuboidal cells, a surface layer of cone- or cylindrical shaped cells and, particularly over eyelids, one to 3 intermediate layers of polygonal cells.

Scattered among the epithelial cells are some mucus-secreting goblet cells.

At the edge of the cornea, the conjunctival epithelium becomes the stratified squamous type.
Anatomy of the Eye

The wall of the globe is composed of the dense elastic supporting membrane.

The anterior part of the membrane is transparent - The cornea

The reminder is opaque - The sclera

The anterior part of the sclera is covered by a mucous membrane the conjunctiva which is reflected from its surface onto the lids

**Cornea consists of 5 layers**

1. Epithelium
2. Bowmans membrane
3. substantin preparia (or) stroma (90%)
4. Descemet's membrane
5. Endothelium

**Stroma**

Composed of regularly arranged thin fibrils of collagen ensheathed by acid mucopoly saccharides and set in a ground substance.

Transparency of cornea is closely related to the regularity of the stornal components

The cornea is overlapped by sclera all round the periphery

The junction of 2 tissues is known as limbus [ corneo scleral junction ]

**CORNEA**
- highly supplied by Trigemial nerve
- No blood vessels
- It is nourished by conjunctival vessels at the periphery & by the aqueous humour

**Inner aspect of the sclera**

i) Highly vascular uveal tract is concerned chiefly with nutrition of the eye
ii) Nervours layer, - Retina

**UVEAL TRACT**

Consists 3 parts

i) Posteriorly - Choroid
ii) Anteriorly - Iris
iii) Middle - Ciliary body & Ciliary process

![Diagram showing segments of the eye]

**Anterior chamber**

The space behind the cornea and infront of the pupil
- It is filled with anterior chamber humour
- Its peripheral recess is known as Angle of Anterior chamber

At this part of corneo scleral wall there is circular venous sinus, sometimes broken up into more than one lumen called canal of schlemm, which is useful in drainage of Aqueous humour

At the periphery between the recess of Ac and canal of schlemm, there lies a loosely constructed mesh work of tissues, called ‘Trabecular Meshwork’

Diagram – 1.13 PPg 17

**IRIS**

It is thinnest at its attachment the ciliary body
- composed of stroma, usually pigmented but largely unpigmented in blue rides
- The two muscles which control the movements of iris are
  a) Shincter pupillae - Circular bundle running radially to the pupillary margin
  b) Dilator pupillae - Arranged medialy near the root of iris

*Iris* richly supplied by sensory nerve fibres of Trigeminal nerve.

*sphiacter pupillae*: motor nerve fibres, nerve supplied by oculomotor nerve fibre

*Dilator pupillae*: motor nerve fibres are supplied by cervical sympathetic chain.
**CILIARY BODY**

The chief mass of ciliary body composed of unstriped muscle fibres, the ciliary muscle.

The inner surface of the ciliary body is divided into 2 regions:
- Ant. part : Pars plicata
- Post. part : Pars plana

The ciliary body extends backwards as the serrata at point which the retina proper begins abruptly.

**RETINA**

The innermost and sensitive layer of the eye. The retina consists of number of layers, formed by 3 groups of cells:
- Visual cells
- Bipolar cells
- Ganglion cells

Rodents and cones, are the end organs of vision.

At the posterior pole which is situated about 3mm to the temporal side of the optic disc, a specially differentiated spot is found in the retina the fovea centralis depression or pit, where only cones are present.

The fovea is the most sensitive part of the retina and is surrounded by the small area macula lutea.
The place where optic nerve emerges in the retinal layer is said to be optic disc.

**LENS**

- Bioconvex mass of peculiarly differentiated epithelium
- Embryologically develops from surface ectodermi
- Central nucleus of the lens artists of the oldest cells and periphery consists of youngest cells

**Coverings**

The lens is surrounded by a hyaline membrane, the lens capsule, which is thicker over the anterior than the posterior.

Behind the lens is the large vitreous chamber containing the vitreous humour.

This is a jelly like material chemically nature of an intert – gel containing a few cells and wandering Leucocytes.

The vitreous body is attached anteriorely to the posterior lens surface by the ligament of wiegert.

Posteriorly the vitreous body is attached to margin of optic disc, macula and larger blood vessels.
PHYSIOLOGY OF EYE

Formation of intraocular fluid

- Ultrafiltration
- diffusion
- secretion

The secretory process is powered by the metabolic activity of the cells of the ciliary epithelium and probably accounts for 95% of the total quantity of aqueous humour.

It is rich in sodium & contains Ascorbic acid

The blood – Aqueous barrier, separates the blood from mixing with Aqueous humour

Contents

- Consists of a dilute solution which is similar to that of plasma
- However, the lactic acid is in Aqueous humour is sexless when compared to blood, due to the formation as an end-product of the metabolism of lens

CIRCULATION
Necessary for both Metabolic purposes and to regulate the intraocular pressure

Ciliary region \rightarrow formation of Aq.humour

\downarrow

Anterior Chamber - Via pupil

\downarrow

Trabecular meshwork (Situated near by the angle)

\downarrow

Schlemm channel

\downarrow

Collector channel

\downarrow

Aqueous veins

\downarrow

Episceral veins

Secondary Exit

Uveoscleral outflow

\downarrow

Ciliary body

\downarrow

Choroid tissue
Suprachoroid tissue

↓

Episcleral tissue

**Intraocular pressure**

Prolonged changes in intraocular pressure are essentially caused by 2 factors

i) Alteration in formation of Aqueous

ii) Alteration in the resistance to outflow

which may result in glaucoma.

Factors determining prolonged changes in the intraocular pressure

i) Variations in hydrostatic pressure in capillaries

ii) An increase in permeability of the capillaries

iii) A change in the osmotic pressure of the blood

iv) Volumetric changes

v) A blockage in the circulation of aqueous humour.

**Physiology of conjuctiva**

It is thin mucous membrane lining the surface of the eye and eyelids and is divided into 2 portions, palpebral and bulbar
The folds uniting the palpebral and bulbar portions are the fornices.

The palpebral conjunctiva is said to commence at the anterior margin of the edge of the lid.

There are 2 layers of epithelium over the palpebral conjunctiva. The epithelium becomes gradually thicker from the fornices to the limbus forming a stratified non–keratinized epithelium near the corneal margin.

Below the epithelium is a adenoid layer consisting of loose connective tissue containing Leucocytes. Below the adenoid alayer there is dense fibrous layer passing insensibly into the underlying tissue either lid or sclera.

The palpebral conjunctiva is firmly adherent to the tarsus, while the bulbar portion is freely movable over the sclera except close to the cornea.

**Lubricating Factors of conjunctiva**

**Tear film** :

1. Mucinous layer - covering conjunctiva and cornea secreted by Globet cells (underneath layer).

2. Aqueous layer - secreted by lacrimal and accessory conjunctival glands

3. Lipid layers - meibomian glands limits evaporation of tears. (Superficial layer)

The triple layered sand which maintains a smooth ocular surface and the oxygen dissolved in it from the atmosphere nourishes the corneal epithelium.

The tears also help to waste off debris and play a role in immunological protection of the ocular surface with the help of the enzyme lysozyme and secretory immunoglobulin. A
The “Conjuctival sac” is never free from organisms, but because of its relatively low temp. evaporation of lacrimal fluid and moderate blood supply, bacteria do not readily propagate themselves.

PATHOLOGY OF PTERYGIUM

A pterygium (Greek. pterygos meaning “wing”) is a degenerative condition of subconjunctival tissue, which proliferates as fibro vascular granulation tissue to invade cornea, destroying superficial layers of stroma and Bowman's Membrane, the whole is covered by conjunctival epithelium.

It is typically raised, ranging from pearly white to pink in color, and triangular in shape with the apex, or head, on the cornea and characteristically presenting at the three and nine o’ clock positions at the limbus.

Pterygium commonly grows from the nasal side of the sclera because the cornea acts as a lens for sunlight on the medial / nasal side but not on the lateral / temporal side, owing to the shadow cast by the nose. Pterygium is due to localized limbal stem cell deficiency and the scattered light incident at the temporal limbus or temporally is focused at the nasal limbus thus damaging the nasal basal limbal cells and explaining the increased preponderance of nasal pterygium.

Atypically located pterygia may imply other etiologies. According Goldman and Kaufman pterygium presenting in an oblique axis suggest an alternate diagnosis, such as Terrien’s marginal degeneration(1).

Pseudopterygia are common inflammatory adherences of the conjunctiva to the cornea in eyes damaged by chemicals, heat or trauma. They can appear
anywhere along the nasal or temporal limbus and progress onto the cornea at an oblique axis, bridging the limbus so that a probe can be passed underneath.

Pterygia can vary from small, atrophic quiescent lesions to large, aggressive, rapidly growing fibro vascular lesions that can distort the corneal topography and in advanced cases, they can obscure the optical center of the cornea.

An advancing pterygium can produce marked changes in refractive state and curvature before entering optical zone which can cause visual impairment (corneal astigmatism).

**SEX INCIDENCE**

Pterygium most commonly affects the senile age group of male personalities whose occupations are mostly in:

1. Hot weathers
2. Windy areas
3. Fishermen
4. Sailors
5. Farmers and
6. Outdoor Field workers (Constructors, Engineers)

**THE DEGENERATE CELL**

*Condition of Degenerative cell*

Although cell degeneration and death are normal at the end of the cells life span they may also be an indicator of injury.
Cell degeneration is significant to the cytopathologist because of its potential to be misinterpreted as malignancy.

During degeneration the nucleus may become swollen and portions of the cytoplasm lost. This imparts the impression of an elevated nuclear to cytoplasmic ratio.

Also during degeneration the chromatin may begin to clump and become hyperchromatic (Karyorrhexis) and the nuclear membrane may become wrinkled.

Condensation of the chromatin (Karyopykonosis) can be misinterpreted as ink-dot nuclei present in some cells from squamous cell carcinoma.

An eg. of the cell degeneration that may be present in the probasal cells in vaginal atrophy.

**CAUSES OF PTERYGIUM**

- Prolonged UV exposure
- Residence at Tropical and equatory areas
- Degenerative lesion
- Blue and U.V rays
- Water man (Fisher mans&sailors)
- High light reflectivity, including from sand and H₂O
- Inflammation such as peripheral corneal ulceration
- Secondary to previous trauma
SIGNS OF PTERYGIUM (IN CHRONOLOGICAL ORDER)

1. A small grey corneal capacity develops near the nasal limbus,
2. The conjunctiva overgrews the opacity and progressively encroaches onto the cornea in a triangular fashion.
3. A deposit of iron (stocker line) may be seen in the corneal epithelium anterior to the advancing head of the pterygium

PTERYGIUM CAN BE CLASSIFIED INTO FIVE GROUPS:

1. Actively growing pterygium
2. Slowly growing pterygium
3. Stationary pterygium
4. Fleshy pterygium
5. Atrophic pterygium

GRADING OF PTERYGIUM:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Crossing Limbus</td>
</tr>
<tr>
<td>II</td>
<td>Midway between limbus and pupil</td>
</tr>
<tr>
<td>III</td>
<td>Reaching upto pupillary margin</td>
</tr>
<tr>
<td>IV</td>
<td>Crossing pupillary margin</td>
</tr>
</tbody>
</table>

Complications of pterygium

1. Distortion or reduction of central vision due to involvement of visual axis or induced astigmatism and disruption of the precorneal tear film.
2. Redness
3. Chronic Irritation
4. Chronic scarring of conjunctiva and cornea
5. Extensive involvement of the extra ocular muscles may restrict ocular motility and contribute to diplopia. Scarring of the medial rectus muscle is most common cause of diplopia in patients with pterygium
6. In-patients with significantly elevated pterygia focal drying and subsequent thinning of the adjacent cornea can occur on rare occasion.

**Histopathology:**

The histopathologic appearance of pterygium is characterized by 3 basic elements

First element is the epithelial covering of atrophic conjunctiva which overlies a second element, which is a bulky mass of thickened hypertrophied, degenerated Numerous theories have been postulated for the pathogenesis of pterygia, including choline deficiency, inflammation, degeneration, tissue angiogenesis factor; changes in the elastic tissue and immune mechanisms.

One theory is that tear film abnormalities cause drying of the cornea and conjunctiva, which in turn predispose to new growths. This theory has been supported by studies of geographical distribution, i.e., pterygia appear to occur more frequently in hot, dry climates.
Ultraviolet irradiation been suggested as being a major environmental
disposing factor in primary pterygia. Ultraviolet light causes mutations in both UV –
sensitive TP53 tumor suppression genes in the parental limbal basal cells and the
elastin gene of the fibroblasts in the limbal epithelium mutations in other genes are
progressively acquired. This allows the multistep development of pterygium and
limbal tumor cells from P53 expressing limbal epithelial cells. These cells overlie
pinguecula of the altered fibroblasts that make abnormal elastotic material and
express various Matrix Metallo Proteins (MMPs).

Mutations in the TP53 gene family in the parental limbal basal cells also
result in the overproduction of TGF-β by the pterygium cells. Excess TGF - β
secretion by the pterygium cells can explain tissue changes and MMP expressions
seen in pterygia

First, pterygium cells (altered limbal basal epithelial cells) produce elevated
MMP -2, MMP – 9, MT1- MMP, and MT2 – MMP, causing dissolution of
hemidesmosome attachments. Initially, the pterygium cells migrate centrifugally in all
directions onto the adjacent and joined corneal, limbal and conjunctival basement
membranes. Because of the TGF - β production of these cells, they have a reduced
number of cell layers and no tumor mass is seen, resulting in an invisible tumour.
Later, after an entire group of altered limbal basal cells develop and all
hemidesmosomes are dissolved under these cells, they migrate as a suppressed
growth onto the cornea followed by conjunctival epithelium, expressing all 6 MMPs
and contributing to the dissolution of Bowman’s layer. In addition, TGF-β synthesized by the pterygium cells causes increased monocytes and capillaries within the epithelial and stromal layers. Connective tissue which has abnormal collagen. The third element is blood vessels, which are dispersed among the hypertrophied collagen fibers. Histopathology of the abnormal collagen in the area of elastotic degeneration shows basophilia with hematoxylin and eosin stain.

On the corneal side immediately in front of the head of the pterygium, the fibroblasts penetrates the cornea between Bowman’s layer and the basement membrane of the overlying epithelium and these fibroblasts account for the gray zone or cap and this is thought to prepare a path for fibro vascular tissue to penetrate the cornea.
COMMON SITE OF PTERYGIUM

IS

‘INTER PALPEBRAL FISSURE’

The main reasons for the occurrence of pterygium in interpalpebral fissure is

a) The U.V rays exposure is more predominant in the palpebral fissure area, whereas the occurrence is nil in upper and lower part of eye which is due to the closure by eyelids, which prevent the U.V rays exposure

b) The atmospheric air exposure to the eye is more in the palpebral fissure and the chance of being dried is more when compared to superior and inferior aspects which are under constant cover by eyelids.

**Difference between progressive pterygium and stationary peterygium or progressive or Progressive pterygium or Atrophic pterygium**

<table>
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<th>Sl.No</th>
<th>Progressive Pterygium</th>
<th>Stationary Peterygium</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thick fleshy and vascularised</td>
<td>Thin, pale or white membrane</td>
</tr>
<tr>
<td>2</td>
<td>Grey infiltrate may be seen in front of the head</td>
<td>Not seen</td>
</tr>
<tr>
<td>3</td>
<td>Younger age group</td>
<td>Older age group</td>
</tr>
</tbody>
</table>

**Differences between True pterygium and pseudo pterygium**

<table>
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<tr>
<th>Sl.No</th>
<th>True pterygium</th>
<th>pseudo pterygium</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age usually above 40 years</td>
<td>Any age</td>
</tr>
<tr>
<td>2</td>
<td>Present in palpebral fissure region</td>
<td>Any where around the limbus</td>
</tr>
<tr>
<td>3</td>
<td>Probe cannot be passed under the pterygium</td>
<td>Probe can be passed under the pterygium</td>
</tr>
<tr>
<td>4</td>
<td>Initially it is always progressive</td>
<td>Always stationary</td>
</tr>
<tr>
<td>5</td>
<td>No such history</td>
<td>There may be past history of sever conjunctivitis, chronical burns or other injuries</td>
</tr>
</tbody>
</table>
DIFFERENTIAL DIAGNOSIS OF PTERYGIUM

1. PINGUECULA

According to Harshmohan

Pingueacla is a degenerative condition of the collagen of the bulbar conjuctiva

Clinically the condition appears as raised yellowish on the

i) interpalpebral

ii) Bulbar conjunctiva of both eyes

Histologically

Pinguecula

- elevated, white to yellow in colour horizontally oriented
- less transparent than normal conjunctiva
- current information however suggest that pinguecula does not progress to pherygium and that the two are distinct disorders

Basophilic degeneration of the sub – epithelial collagen of conjunctiva.
Mutations of p53 gene

Conjunctival intraepithelial neoplasin may be difficult to differentiate from keratinization of pinguecula

Degenerative conditions increase in prevalence with increasing age

- Due to chronic exposure to UV rays
- As a result of past inflammation
- Of long term toxic effects
- Of environment expose
- Or by ageing itself
2. GLAUCOMA

Glaucoma
- Primary
  - Primary Glaucoma
    - Simple Glaucoma
    - Conjective Glaucoma
  - Conjective Glaucoma
- Secondary
  - Secondary Glaucoma
    - Melamoma

↓

Common in paediatrics

Symptoms
- Hereditary
- Congenital
- Family History

Glioma, (Melamoma)
3. TUMOURS OF THE CONJUNCTIVA

I. Conjunctival lymphoid tumours

Lymphoid tumours of the conjunctiva appear as salmon – coloured mass within the fornix or on the surface of the globe.

II. Squamous papilloma

Squamous papilloma arise from the conjunctiva epithelium in diverse clinical settings. In children they are often bilateral and recur after excision.

In adults papillomas are usually solitary and unilateral.

III. Dysplasia and intraepithelia Neoplasia

IV. Squamous cell carcinoma
Conjunctival squamous cell carcinoma usually grows as a papillary exophytic mass. Cellular atypia occurs throughout the entire epithelial thickness, and neoplastic cells extend into the underlying stroma either individually or in nests.

V. Spindle cell CA

Rarely arises in conjunctiva but there is aggressive clinical courses than the usual well - differentiated conjunctival squamous carcinoma.

Clinical features of conjunctival disorders

1. Redness
2. Stickiness
3. Foreign body sensation
4. Grittiness
5. Lacrimation
6. Photophobia
7. Burning sensation
8. Dryness of eye.
9. Vision is generally normal but blurring occur.
10. Hyperaemia

10. a) Acute : mainly due to foreign body in conjunctival sac
10. b) Chronic: Concretions, would cause acute and recurrent infections.

   Dusty, ill-ventilated rooms or exposure to heat or dryness

10. c) Non conjunctival cause

   - Excessive Alcohol take
   - High fever

11. Conjunctival discharge

   Excess secretion in conjunctival disorders and is prominent feature in conjunctivitis

11. a) Mucoid / Watery discharge - viral conjunctivitis
11. b) Mucopurulent / Purulent - Bacterial
11. c) Ropy / Stringy mucoid discharge - Allergic

12. Conjunctival Inflammatory reaction

12. a) Follicles
12. b) Papillae
12. c) Granulomas
Cicatrical phemphigoid is an idiopathetic sub-epidermal, subepithelial blistering and scarring autoimmune (Type II hypersensitivity) disease characterised by autoantibodies that bind to basement membrane. The condition usually presents in late middle age and affects women more commonly than men.

Sign & symptoms

- Dry eye
- symblepharon
- Secondary keratopathy

**Steven - Johnson syndrome**

Acute, severe, muco – cutaneous, blistering disease, due to abnormal immunological reaction

Most common precipitating factor is

- drug hypersensitivity (or)
- viral infection

Basic lesion is an acute vasculitis of skin and mucous membrane and conjunctiva is involved in 90% of cases

**Parinand Occuloglandular syndrome**

Rare condition of conjunctiva associated with systemic cat scratch disease (fever) and tularaemia

**Causative organism**

Bortonella henselae

Hepatomegaly

&
Spleemomegaly
Pneumonia
Osteomyelitis

**Diabetes**

Conjunctival Anneurysms are common in diabetes

**Sub - Conjunctival Heamorrhage is common in**

- Wheeeping cough
- H.T
- Bleeding diasthesis

**Conjunctival Hypothesia**

(Decrease in sensation)

Common in Sys. Disorders like

1. Leprosy
2. Dm
3. Cranial nerve palsyies

**Peri-limbal conjunctival vitilliago**

Seen in cases of systemic disase such as

i. Vogt - Koyamagi - Harada syndrome
Neurological & skin ailment features are seen.

**Blue eye - Osteogenesis imperfecta**

Disorder of connective tissue especially in ‘Bone & Eye’

The connective tissue in sclera is underdeveloped, so

**Scleral discoloration**

Alkaptonuria (ochronosis)

Brow – black discoloration at the insertions of horizontae recti and pigmentation of the pinnae.

**Haemochromatosis**

Rusty – Brown discoloration of conjunctiva

**DISCUSSION**

**Interpretation of Siddha Parameters**

The observed results and other entities that have been studied are discussed under the following headings

**Age & Sex Distribution**
The most common affected sex is male.

Due to chronic exposure to sunlight & UV rays the male have high risk of being affected by pterygium (Naga padalam).

The incidence is high in senile age group, Because the degenerative process is common in senile age group due to altered, chemical values in body.

**Occupation**

Pterygium is more among, Farmers and outdoor workers, due to the longer exposure in sunlight.

**Socio Economic status**

Low class people are most commonly affected due to the work in sunlight exposed areas and poor preventive measures to safeguard the eyes.

**Seasonal Variation**

The Ilavenil (Chithirai & Vaikasi) & Muthuvenil (Aani, Aadi) Seasons are more prone to occurrence of Nagapadalam, due to hot temperature and windy climate.
**Mukkutra Verupadugal**

**Vatham**

Due to the elevated level of Vatha Naadi sheep is disturbed and the potency or stamina of 5 sense organs is affected or decreased.

Nagan & Koorman are affected – pre corneal tear film is affected

**Pitham**

Main function is to maintain normal issue

Due to the elevated pitha humour decreased duration of sheep & eyes (Conjunctiva & Sclera) Urine, Motion and Skin colour changes occur.

Alosaga pitham - affected (Diminished vision & Corneal astigmatism)

**Kabam**

- Tharpagam is affected
- Burning sensation, Grittiness & Irritation is most common due to increased kabam

**Udal Thathukkal**

Saram - Affected (Tiredness of Body & Soul)
Seneer - Affected (Generalised weakness of body & Diminished vision)
INTERPRETATION OF ENVAGAI THERVUGAL

**Naa** : ‘Pale’ - Due to Anaemia

**Niram** : Affected ‘ Pale colour of Skin ‘

**Vizhi** : Affected - Diminished vision due to corneal opacity

**Neikuri**: Oil spreads like ring, snake, sieve & pan

INTERPRETATION OF ALLIED PARAMETERS

The Eye examination of the 20 cases reveal that

- Lids : Normal
- Anterior Chamber : Normal Depth
- Iris : Normal colour in treatment
- Pupil : Acting
- Occular movements : full
- Duct : Free
- Tension : Normal
All the 20 patients have changes in cornea and conjunctiva

The cornea is Hazy, ulcerated & Encroached by head of pterygium in the patients according to the level of lesions

All the 20 patients have altered conjunctiva in the affected eye.

Some patients have
- ‘inflammed’ conjunctiva
- Muddy conjunctiva

According to the level of lesions

Most of the patients have diminished vision and distorted vision due to the pterygium pulling of corneal curvature.

**HIGHLIGHTS OF DISSERTATION TOPIC**

Nagapadalam is one of the main Eye disease explained by Agathiyar in his Agathiyar Nayana vithi – 500

The clinical features mentioned by Agathiyar in Nagapadalam Topic

1. Redness
2. Epiphora
3. Itching
Mukkuttra Verupadugal, i.e. three humoral changes play major role in the development of disease. Most of the Eye disease are formed by alteration of pitha humour.

The altered pitha humour in eye is manifested first followed by degenerative condition of eye due to altered kabam.

In this disease (Naga Padalam) First affected humor is pitham, and next is kabam.

In Nagapadalam the first affected sight is conjunctiva of the eye.

Due to increased exposure of UV rays, the matrix metalloproteinases in the conjunctival limbal cells, and by activation of fibroblasts the, conjunctiva develops into an filmy layer, which encroaches the epithelial i.e. outer layer of cornea.

By days, it infiltrates to Bowman’s membrane and later on to substantia propria (Stroma) which produces marked changes in refraction and cause visual impairment i.e corneal astigmatism.

UV rays is the one of the etiological factor. When the changes are obvious itching is marked and watering, redness are present in eye.

At last the author comes to conclusion that features said above are closely related to the Eye disease Naga padalam.
Conclusion

The lines that were described in Naga Padalam of Agathiya Nayana Vithi explains the clinical features of milky white capacity of the cornea due to the filmy growth on the sclerotic coat of eye.

As per “Agasthiyar Nayana Vithi” the signs and symptoms of “Naga Padalam”, are studied in all the cases which have selected. These were examined and analysed thoroughly by siddha and modern aspects.

All the pictures in siddha parameters show changes in the physical constituents, three humour, seasonal variations and Envagai Thervugal.

Naga Padalam is confirmed by “Histopathological examinations” and by “Orbscan” the severity of lesions are noted.

The slit lamp examination shows the external lesions of conjunctiva and cornea.

If the aliment is not treated properly, it leads to complete closure of optical axis by the iterygium.

Also, headache and distorted vision, will be the initial problem.

Later on it may leads complete loss of vision and continuous irritation.

Early intervention, either by medical or surgical the rest of vision.

The modern parameter play a important role in the diagnostic purpose.

Finally, Naga padalam has very good prognosis if treated properly and good adaptation of medical advice mentioned in siddha system of medicine.
Annexure – 1

<table>
<thead>
<tr>
<th>Name of the medical unit</th>
<th>:</th>
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<tbody>
<tr>
<td>I.P.No./OP.No</td>
<td>Nationality :</td>
</tr>
<tr>
<td>Name</td>
<td>Religion :</td>
</tr>
<tr>
<td>Age</td>
<td>Date of Admission :</td>
</tr>
<tr>
<td>Sex</td>
<td>Date of Discharge :</td>
</tr>
<tr>
<td>Occupation</td>
<td>Diagnosis :</td>
</tr>
<tr>
<td>Income</td>
<td>Results :</td>
</tr>
<tr>
<td>Address</td>
<td>Medical Officer :</td>
</tr>
</tbody>
</table>

Complaints & Duration : 

H/O Present illness : 

H/O Previous illness : 

Personal History : 

Family History : 

114
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

<table>
<thead>
<tr>
<th>Vaai</th>
<th>Vasanam</th>
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<tbody>
<tr>
<td>Kai</td>
<td>Dhanam</td>
</tr>
<tr>
<td>Kaal</td>
<td>Kamanam</td>
</tr>
<tr>
<td>Eruvai</td>
<td>Visarkam</td>
</tr>
<tr>
<td>Karuvai</td>
<td>Anantham</td>
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</table>

Paruvakalam

<table>
<thead>
<tr>
<th>Karkalam</th>
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<tbody>
<tr>
<td>Koothirkalam</td>
</tr>
<tr>
<td>Munpanikalam</td>
</tr>
<tr>
<td>Pinpanikalam</td>
</tr>
<tr>
<td>Elavernirkalam</td>
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<tr>
<td>Mudhuvianirkalam</td>
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</tbody>
</table>

Utkayam / Athakayam

<table>
<thead>
<tr>
<th>Puyam</th>
<th>Foreran</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sayam</td>
<td>Arm</td>
</tr>
<tr>
<td>Kaal</td>
<td>Leg</td>
</tr>
</tbody>
</table>
Paatham - Feet :

Uyir thathukkal

1) Vatham

Pranan :
Abanan :
Viyanan :
Uthanam :
Samanan :
Nagan :
Koorman :
Kiruharan :
Deathathan :
Dhananjayan :

2) Pitham

Anilam :
Ranjagam :
Pirasagam :
Aalosagam :
Sathagam :
3) Kabham

Avalambagam : 
Kilethagam : 
Pothagam : 
Tharpagam : 
Santhigam : 

Ezhu Udal Thathukkal

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

Congential 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
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 :
Congential anomally :
Lymphadenopathy :

<table>
<thead>
<tr>
<th>Pluse Rate</th>
<th>Rhythm</th>
<th>Volume</th>
<th>Character</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Rt)</td>
<td>(Lt)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Blood Presure : 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 Cholesterol :
       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 :
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THEORITICAL VIEW OF DISSERTATION TOPIC IN MODERN ASPECTS

Embryology of Eye

The CNS is developed from the neural groove, which later invaginates to form the neural tube & runs down the dorsal surface of the embryo.

At either side of the ant portion of neural tube a thickening appears at early stage, which is known as optic plate

The optic plate later on develops as optic vesicle. As the optic vesicle meets the surface ectoderm, optic cup is formed and the invaginated surface ectoderm is converted into the lens. The inner layer of the cup forms Retina. The Mesoderm surrounding the optic cup differentiates to form the coats of the eye and the orbital structures such as

1. Anterior layer of iris
2. The angle of the AC
3. Main structures of cornea, Whereas surface Ectoderm remains as corneal and conjunctival epithelium

The surrounding regional folds grow over tinfront of the cornea to form the lids

The eye is essentially formed from both Ectoderm and mesoderm
The electoderm is of 2 types

i) Neural Ectroderm derived from Neural tube
ii) surface Ectoderm derived from side of the head

(Embryology diagram)

OCULAR EMBRYOGENESIS

<table>
<thead>
<tr>
<th>PERIOD AFTER CONCEPTION</th>
<th>MAJOR MILE STONES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3weeks</td>
<td>Optic groove appears</td>
</tr>
<tr>
<td>1Month</td>
<td>Hyaloid vessels develop</td>
</tr>
<tr>
<td>9th week</td>
<td>Migration of waves of neural crest</td>
</tr>
<tr>
<td>3rd month</td>
<td>Ac forms</td>
</tr>
<tr>
<td>4th month</td>
<td>Hyaloid vessels regress retinal vasculature begins</td>
</tr>
<tr>
<td>7th month</td>
<td>myelination of optic nerve begins</td>
</tr>
<tr>
<td>8th month</td>
<td>Ac angle forms</td>
</tr>
<tr>
<td>9th month</td>
<td>Retinal vessels reach temporal periphery</td>
</tr>
</tbody>
</table>
After Birth

Macular Region of the retina develops further

**Primordia Tissue and its derivations**

<table>
<thead>
<tr>
<th>PRECURSOR</th>
<th>DERIVATIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neural Ectoderm</td>
<td>Retina fibers of optic nerve smooth muscles of iris</td>
</tr>
<tr>
<td>Surface ectoderm</td>
<td>Corneal &amp; conjunctival epithelium, lacrimal glands, Tarsal glands lens</td>
</tr>
<tr>
<td>Mesoderm</td>
<td>Extraocular muscles, sclera, Iris</td>
</tr>
<tr>
<td>Neural crest</td>
<td>Orbit bones, ciliary muscle, sclera, corneal stroma</td>
</tr>
</tbody>
</table>

**BASIC HISTOLOGY**

Four important tissue in our body are

A. Epithelia Tissue
B. Disserve Tissue
C. Connective Tissue
D. Muscle Tissue
E. Nerve Tissue

**Epithelia tissues**

- Closely aggregated polyhendral cells with little intercellular substance
- Principle fn of Epithelial tissues
  - Covering & lining surfaces (skin)
  - Absorption (intestive)
  - Secretion (glands)
  - Sensory (Neuro epithelium)
  - Contactive (myoepithelial)

**General characters of Epithelium**

No interstitial space
Presence of a Basal lamina

**Specialization of the cell surface**

- Microvilli
- Cilia and flagella
Connective Tissue

It is composed of fibres

C.T. is characterised morphologically by the presence of several types of cells immersed in abundant intercellular material synthesised by these cells.

Richness intercellular material is one of the main characteristics of connective tissue

C.T. is composed of fibres and matrix (amorphous intercellular substance. Cells, fibres, amorphous substances are embedded.

3 main types of C.T fibres

- Collagenous
- Elastic
- Reticular

C.T makes up tendon, ligament and the aerolar tissue that fills the spaces between organs. Bones and cartilages are

Collagenous fibres

Most numerous fibres in C.T

Collagenous fibres are composed mainly of a sclero protein called collagen, whose principal acid is glycine, proline and hydroxyproline

Elastic fibres

Elastic fibres are easily distinguished from the collagenous fibres

B/C E.F are thinner and do not have longitudinal striations

Cells in connective tissue

- Fibroblasts
- Macrophages
- Mast cells
- Plasma cells
- Lenkocytes
Lamina Propria
The connective tissue layer of the mucous membrane

HUMAN EYE HISTOLOGY

The Conjunctiva

The conjunctiva is a thin transparent membrane which covers the inner surface of each eyelid (palpebral conjunctiva) and the anterior part of the sclera (ocular conjunctiva). At the free margin of the eyelid, the palpebral conjunctiva becomes continuous with skin, and at the margin of the cornea, the ocular conjunctiva becomes continuous anterior epithelium of the cornea. When the eyelids are closed, the conjunctiva forms a closed conjunctival sac. The line along which palpebral conjunctiva reflected onto the eyeball is called the conjunctival fornix superior or inferior. The ducts of the lacrinal gland open to the lateral part of the superior conjunctival fornix. Lacrimal fluid keeps the conjunctiva moist. Accessory lacrimal glands are present near the superior conjunctival fornix.

Conjunctiva consists of an epithelial lining that rests on connective tissue over the eyelids. This connective tissue is highly vascular and contains much lymphoid tissue. It is much less vascular over the sclera.

The epithelium lining the palpebral conjunctiva is typically **two** layered. There a superficial layer of columnar cells, and a deeper layer of flattened cells. At the fornix, and over the sclera, the epithelium is **three** layered there being an additional layer of polygonal cells between the two layers mentioned above. The three-layered epithelium changes to stratified squamous at the sclerocorneal junction, to form as ‘Cornea’.

Histology of Organ systems – Leeson & Paporo

According to Leeson and Paporo

The conjunctival epithelium varies with location. It consists of a basal layer of cuboidal cells, a surface layer of cone- or cylindrical-shaped cells and, particularly over eyelids, one to 3 intermediate layers of polygonal cells.

Scattered among the epithelial cells one some mucus-secreting globet cells.

At the edge off the cornea, the conjunctival epithelium becomes the stratified squamous type.
Anatomy of the Eye

The wall of the globe is composed of the dense elastic supporting membrane.

The anterior part of the membrane is transparent - The cornea

The reminder is opaque - The sclera

The anterior part of the sclera is covered by a mucous membrane the conjunctiva which is reflected from its surface onto the lids

Cornea consists of 5 layers

1. Epithelium
2. Bowmans membrane
3. substantin preparia (or) stroma (90%)
4. Descemet's membrane with its endothelium
5. Endothelium

Stroma

Composed fo regularly arranged thin fibrils of collagen ensheathed by acid mucopoly saccharides and set in a ground substance. Transparency of cornea is closely related to the regularity of the stornal components

The cornea is overlapped by sclera all round the periphery

The junction of 2 tissues is known as limbus [ corneo scleral junction ]

CORNEA

- highly supplied by Trigenial nerve
- No blood vessels
- It is nourished by conjutctive vessels at the periphery
- by the aqueous humour

Inner aspect of the sclera

i) Highly vascular uveal tract which concerned cheifly with nutrition of the eye
ii) Nervours layer, - Retina
UVEAL TRACT

Consists 3 parts

i) Posteriorly - Choroid and ciliary body
ii) Anteriorly - Iris
iii) Lens - Retinal the Iris

SEGMENTS

Anterior segment
- Ant. Chamber

Posterior segment
- Post. chamber

Anterior chamber

The space behind the cornea and infront of the pupil

- It is filled with Aq. humour
- Its peripheral recess is known as Angle of Anterior chamber

At this part of corneo scleral wall there is circular venous sinus, sometimes broken up into more than one lumen called canal of schlemm, which is useful in drainage of Aqueous humour

At the periphery between the recess of Ac and canal of schlemm, there lies a loosely constructed mesh work of tissues, called ‘Trabecular Meshwork’

The major outflow off A of A.Q.H appears to be a series of endothelia pores

Diagram – 1.13 PPG 17

IRIS

It is thinnest at its attachment the ciliary body

- composed of stroma, usually pigmented but largely unpigmented in blue rides
- The two muscles which control the movements of iris are
Shincter pupoillae - Circular bundle running renal the pupillary margin
Dilator pupillae - Arranged redialy near the root of iris

Iris richly supplied by sensory nerve fibres of Vth
sphiacter pupillae motor nerve fibres, nerve supplied by oculomotor nerve fibre
Dilator pupillae motor nerve fibres are supplied by cervical sympathetic chain.

CILIARY BODY

The chief mass of ciliary body composed of unstriped muscle fibres, the ciliary muscle

The inner surface of the ciliary body is divided into 2 region

Ant. part : Pars plicata
Post. part : Pars plana

The ciliary body extends backwards as the serrata at point which the retina proper begins abruptly

RETINA

The innermost and sensitive layer of the eye /. The retina consists of number of layers, formed by 3 group of cells

- Visual cells
- Bipolar cells
- Ganglion cells

Rodes and cones, are the end organs of vision

At the posterior pole which is situated about 3mm to the temporal side of the optic disc, a specially differentiated spot is found in the retina the fovea centralis depression or pit, where only cones are present.

The fovea is the most sensitive part of the retina and is surrounded by the small area macula lutea.

The place where optic nerve emerges in the retinal layer is said to be optic disc

LENS
- Bioconvex mass of peculiarly differentiated epithelium
- Embryologically develops from surface ectodermi
- Central nucleus of the lens artists of the oldest cells and periphery consists of youngest cells

**Coverings**

The lens is surrounded by a hyaline membrane, the lens capsule, which is thicker over the anterior than the posterior

Behind the lens is the large vitreous chamber containing the vitreous humour

This is a jelly like material chemically nature of an intert – gel containing a few cells and wandering Leucocytes

The vitreous body is attached anterioly to the posterior lens surface by the ligament of wiegert.

Posteriorly the vitreous body is attached to margin of optic disc, macula and larger blood vessels
PHYSIOLOGY OF EYE

Formation of intraocular fluid

- Ultrafiltration
- diffusion
- secretion

The secretory process is powered by the metabolic activity of the cells of the ciliary epithelium and probably accounts for 95% of the total quantity of aqueous

It is rich in sodium & contains Ascorbic acid

The blood – Aqueous barrier, separates the blood from mixing with Aqueous humour

Contents

Consists of a dilute solution which is similar to that of plasma

However, the lactic acid is in Aqueous humour is sexless when compared to blood, due to the formation as an end - product of the metabolism of lens

CIRCULATION

Necessary for both Metabolic purposes and to regulate the intraocular pressure

Ciliary region \{ formation of Aq.humour
\[ Anterior Chamber \quad Via pupil
\[ Trabecular meshwork (Situated near by the angle)
\[ Schlemm channel
\[ Collector channel
\[ Aqueous veins
\[ Epischeral veins
Secondary Exit

Uveoscleral outflow
↓
Ciliary body
↓
Choroid tissue
↓
Suprachoroid tissue
↓
Episcleral tissue

Intraocular pressure

Prolonged changes in intraocular pressure are essentially caused by 2 factors

i) Alteration in formation of Aqueous
ii) Alteration in the resistance to outflow

which may result in glaucoma.

Factors determining prolonged changes in the intraocular pressure

i) Variations in hydrostatic pressure in capillaries
ii) An increase in permeability of the capillaries
iii) A change in the osmotic pressure of the blood
iv) Volumetric changes
v) A Blockage in the circulation of Aqueous

Physiology of conjunctiva

It is thin mucous membrane lining the surface of the eye and eyelids and is divided into 2 portions, palpebral and bulbar

The folds uniting the palpebral and bulbar portions are the fornices.

The palpebral conjunctiva is said to commence at the anterior margin of the edge of the lid.

There are 2 layers of epithelium over the palpebral conjunctiva. The epithelium becomes gradually thicker from the fornices to the limbus forming a stratified non-keratinized epithelium near the corneal margin.
Below the epithelium is a adenoid layer consisting of loose connective tissue containing Leucocytes. Below the Adenoid alayer there is dense fibrous layer passing insensibly into the underlying tissue either lid or sclera

The palpebral conjuctiva is firmly adherent to the tarsus, while the bulbar portion is freely movable over the sclera except close to the cornea

**Lubricating Factors of conjuctiva**

**Tear film :**

1. Mucinous layer - covering conjunctiva and cornea secreted by Globet cells (underneath layer).
2. Aqueous layer - secreted by lacrimal and accessory conjuctival glands
3. Lipid layers - meibomian glands limits evaporation of tears. (Superficial layer)

The triple layered sand which maintains a smooth ocular surface and the oxygen dissoved in it from the atmosphere nourishes the corneal epithelium.

The tears also help to waste off debris and play a role in immunilogical protection of the ocular surface with the help of the enzyme lysozyme and secretory immunoglobulin. A

The “Conjuctival sac” is never free from organisms, but because of its relatively low temp. evaporation of lacrimal fluid and moderate blood supply, bacteria do not readily propagate themselves.

**PATHOLOGY OF PTERYGIUM**

A pterygium (Greek.ptyergos meaning “wing”) is a degenerative condition of subconjunctival tissue, which proliferates as fibro vascular granulation tissue to invade cornea, destroying superficial layers of stroma and Bowman’s Membrane, the whole is covered by conjunctival epithelium.

It is typically raised, ranging from pearly white to pink in color, and triangular in shape with the apex, or head, on the cornea and characteristically presenting at the three and nine o’ clock positions at the limbus.
Pterygium commonly grows from the nasal side of the sclera because the cornea acts as a lens for sunlight on the medial / nasal side but not on the lateral / temporal side, owing to the shadow cast by the nose. Pterygium is due to localized limbal stem cell deficiency and the scattered light incident at the temporal limbus or temporally is focused at the nasal limbus thus damaging the nasal basal limbal cells and explaining the increased preponderance of nasal pterygium.

Atypically located pterygia may imply other etiologies. According Goldman and Kaufman pterygium presenting in an oblique axis suggest an alternate diagnosis, such as Terrien’s marginal degeneration(1).

Pseudopterygia are common inflammatory adherences of the conjunctiva to the cornea in eyes damaged by chemicals, heat or trauma. They can appear anywhere along the nasal or temporal limbus and progress onto the cornea at an oblique axis, bridging the limbus so that a probe can be passed underneath.

Pterygia can vary from small, atrophic quiescent lesions to large, aggressive, rapidly growing fibro vascular lesions that can distort the corneal topography and in advanced cases, they can obscure the optical center of the cornea.

An advancing pterygium can produce marked changes in refractive state and curvature before entering optical zone which can cause visual impairment.

**SEX INCIDENCE**

Pterygium most commonly affects the senile age group of male personalities whose occupations are mostly in

1. Hot weathers
2. Windy areas
3. Fishermen’s
4. Sailors
5. Farmers and
6. Field workers (Constructors, Engineers)
THE DEGENERATE CELL

Although cell degeneration and death are normal at the end of the cells life span they may also be an indicator of injury.

Cell degeneration is significant to the cytopathologist because of its potential to be misinterpreted as malignancy.

During degeneration the nucleus may become swallowen and portions of the cytoplasm lost. This imparts the impression of an elevated nuclear to cytoplasmic ratio.

Also during degeneration the chromatin may begin to clump and become hyperchromatic (Karyorrhexis) and the nuclear membrane may become wrinkled.

Condensation of the chromatin (Karyopykonosis) can be misinterpreted as ink – dot nuclei present in some cells from squamous cell carcinoma.

An eg. of the cell degeneration that may be present in the probasal cells in vaginal atrophy.

CAUSES OF PTERYGIUM

- Uv exposure
- Tropical areas and equatory areas
- Degenerative lesion
- blue and U.V rays
- Water man
- High light reflectivity, including from sand and H₂O
- Inflammation such as peripheral corneal ulceration
- Secondary to previous trauma

SIGNS OF PTERYGIUM (IN CHRONOLOGICAL ORDER)

1. A small grey corneal capacity develops near the nasal limbus,
2. The conjunctiva overgrows the opacity and progressively encroaches onto the cornea in a triangular fashion.
3. A deposit of iron (stocker line) may be seen in the corneal epithelium anterior to the advancing head of the pterygium

PTERYGIUM CAN BE CLASSIFIED INTO FIVE GROUPS:

1. Actively growing pterygium
2. Slowly growing pterygium
3. Stationary pterygium
4. Fleshy pterygium
5. Atrophic pterygium

**GRADING OF PTERYGIUM:**

<table>
<thead>
<tr>
<th>Grade I</th>
<th>Crossing Limbus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade II</td>
<td>Midway between limbus and pupil</td>
</tr>
<tr>
<td>Grade III</td>
<td>Reaching up to pupillary margin</td>
</tr>
<tr>
<td>Grade IV</td>
<td>Crossing pupillary margin</td>
</tr>
</tbody>
</table>

**Complications of pterygium**

1. Distortion or reduction of central vision due to involvement of visual axis or induced astigmatism and disruption of the precorneal tear film.
2. Redness
3. Chronic Irritation
4. Chronic scarring of conjunctiva and cornea
5. Extensive involvement of the extra ocular muscles may restrict ocular motility and contribute to diplopia. Scarring of the medial rectus muscle is the most common cause of diplopia in patients with pterygium.
6. In-patients with significantly elevated pterygia focal drying and subsequent thinning of the adjacent cornea can occur on rare occasion.

**Pathogenesis**

Numerous theories have been postulated for the pathogenesis of pterygia, including choline deficiency, inflammation, degeneration, tissue angiogenesis factor, changes in the elastic tissue and immune mechanisms.

One theory is that tear film abnormalities cause drying of the cornea and conjunctiva, which in turn predispose to new growths. This theory has been supported...
by studies of geographical distribution, i.e., pterygia appear to occur more frequently in hot, dry climates. Ultraviolet irradiation has been suggested as being a major environmental disposing factor in primary pterygia. Ultraviolet light causes mutations in both UV-sensitive TP53 tumor suppression genes in the parental limbal basal cells and the elastin gene of the fibroblasts in the limbal epithelium, mutations in other genes are progressively acquired. This allows the multistep development of pterygium and limbal tumor cells from P53 expressing limbal epithelial cells. These cells overlie pinguecula of the altered fibroblasts that make abnormal elastotic material and express various Matrix Metallo Proteins (MMPs).

Mutations in the TP53 gene family in the parental limbal basal cells also result in the overproduction of TGF-β by the pterygium cells. Excess TGF-β secretion by the pterygium cells can explain tissue changes and MMP expressions seen in pterygia.

First, pterygium cells (altered limbal basal epithelial cells) produce elevated MMP-2, MMP-9, MT1-MMP, and MT2-MMP, causing dissolution of hemidesmosome attachments. Initially, the pterygium cells migrate centrifugally in all directions onto the adjacent and joined corneal, limbal and conjunctival basement membranes. Because of the TGF-β production of these cells, they have a reduced number of cell layers and no tumor mass is seen, resulting in an invisible tumor.

Later, after an entire group of altered limbal basal cells develop and all hemidesmosomes are dissolved under these cells, they migrate as a suppressed growth onto the cornea followed by conjunctival epithelium, expressing all 6 MMPs and contributing to the dissolution of Bowman’s layer. In addition, TGF-β synthesized by the pterygium cells causes increased monocytes and capillaries within the epithelial and stromal layers.
Second, a group of normal fibroblasts gather under the invading limbus epithelium next to the dissolved edges of Bowman’s layer and are activated by a TGF-β bFGF pathway\textsuperscript{33} to produce excess MMP -1 and MMP-3 as they help a dissolve Bowman’s layer.

Some of these cytokine activated fibroblasts migrate anterior to the leading edges of pterygia between Bowman’s layer and the basement membrane of the corneal basal cells to form little islands of fibroblasts that make MMP -1 and locally help to dissolve Bowman’s layer\textsuperscript{33}.

**Histopathology:**

The histopathologic appearance of pterygium is characterized by 3 basic elements

First element is the epithelial covering of atrophic conjunctiva which overlies a second element, which is a bulky mass of thickened hypertrophied, degenerated connective tissue which has abnormal collagen. The third element is blood vessels, which are dispersed among the hypertrophied collagen fibers. Histopathology of the abnormal collagen in the area of elastotic degeneration shows basophilia with hemotoxylin and eosin stain.
On the corneal side immediately in front of the head of the pterygium, the fibroblasts penetrates the cornea between Bowman’s layer and the basement membrane of the overlying epithelium and these fibroblasts account for the gray zone or cap and this is thought to prepare a path for fibro vascular tissue to penetrate the cornea.
New Concepts

New theories include the possibility of damage to limbal stem cells by UV light and by activation of Matrix metalloprotinases.

Histo Pathological Examination

Similar to pinguecula, except that Bowman’s membrane is destroyed within the corneal component. β radiation - late scleral necrosis. Now conjunctival autografting & mitomycin C application. Human Aminotic membrane grafts.

Original Boundary Between Cornea and Sclera Located at the Original Edge of Bowman’s Layer

Pterygium pathogenesis. Corneal invasion by matrix metalloproteinase (MMP) expressing altered limbal epithelial cells and activation of fibroblasts. CJ indicates cojunctiva with goblet cells infiltrated by pterygium cells: DBL, dissolved Bowman’s layer; F1, fibroblasts making abnormal elastotic material (the pinguecula tumor); FII, fibroblasts making collagen and possibly elastic materials; FIII, fibroblasts making MMP-1 at dissolved edge of Bowman’s layer; FIV, fibroblasts (fibroblast islands) making MMP-1 at dissolved edges of Bowman’s layer; G, goblet cells; ML, migrating limbus; MMP B, MMP expressing altered limbal basal epithelial cells invading cornea and conjunctival epithelium; and V,l blood vessels (angiogenesis)
DIFFERENTIAL DIAGNOSIS OF PTERYGIUM

1. PINGUECULA

According to Harshmohan

Pinguecula is a degenerative condition of the collagen off the bulbar conjunctiva

Clinically the condition appears as raised yellowish on the

i) interpalpebral
ii) Bulbar conjunctiva of both eyes

Histologically

Pingueculae
- elevated, white to yellow in colour horizontally oriented
- less transparent then normal conjunctiva
- current information however suggest that pinguecula does not progress to pherygium and that the two are distinct disorders
Basophilic degeneration of the sub – epithelial collagen of conjunctiva

The overlying epithelium shro acarthesin, hyperrkeratosis (or) dyskeratosis

Mutations of p53 gene
Conjunctival intraepithelial Neoplasin may be difficult to differenciate from keratinization of pingnecula

Degenerative conditions increase in prevalence with increasing age
- Due to chronic exposure to UV rays
- As a result of past inflammation
- of long term toxic effects
- of environment expose
- or by ageing itself
2. GLAUCOMA

Primary Glaucoma

- (Conjunctive) Glaucoma
- (Simple) Glaucoma

↓

Neha; -

Glioma, (Melamoma)

↓

Common in paediatrics

↓

Hereditary

3. TUMOURS OF THE CONJUNCTIVA

I. Conjunctival lymphoid tumours

Lymphoid tumours of the conjunctiva appear as salmon – celored mass within the fornix or on the surface of the globe

II. Squamous papilloma

Squamous papilloma arise from the conjunctiva epithelium in diverse clinical settings. In children they are often bilateral and recur after excision.

In adults papillomas are usually solitary and unilateral.
III. Dysplasia and intraepithelia Neoplasia

IV. Squamous cell carcinoma

Conjuctival S.C.C usually grows as a papillary exophytic mass. Cellular atypia occurs throughout the entire epithelial thickness, and neoplastic cells extend into the underlying stroma either individually or in nests.

V. Spindle cell CA

Rarely arises in conjunctiva but there is aggressive clinical courses than the usual well – differentiated conjunctival squamous carcinoma.

Clinical features of conjunctival disorders

1. Redness
2. Stickiness
3. Foreign body sensation
4. Grittiness
5. Lacrimation
6. Photophobia
7. Burning sensation
8. Dryness of eye.
9. Vision is generally normal but blurring occur.
10. Hyperamia
10. a) Acute mainly due to foreign body in conjunctival sac
10. b) Chronic Concretions, would cause acute and recurrent
   Dusty, ill-ventilated rooms or exposure to heat or dryness
10. c) Non conjunctival cause
   - Excessive Aleocnol take
   - High fever
11. Conjuctival discharge

   Excess secretion in conjunctival disorders and is prominent feature in conjunctivitis.
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>11. a) Mucoid / Watery discharge</td>
<td>-</td>
<td>viral conjunctivitis</td>
</tr>
<tr>
<td>11. b) Mucoparent / Purlent</td>
<td>-</td>
<td>Bacterial</td>
</tr>
<tr>
<td>11. c) Ropy / Stringy mucoid discharge</td>
<td>-</td>
<td>Allegic</td>
</tr>
</tbody>
</table>

12. Conjuctival Inflammatory reaction

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<table>
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<tr>
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<th></th>
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</thead>
<tbody>
<tr>
<td>12. a) Follicles</td>
<td></td>
</tr>
<tr>
<td>12. b) Papillae</td>
<td></td>
</tr>
<tr>
<td>12. c) Gramulomas</td>
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</tbody>
</table>
AIM AND OBJECTIVES

Eye diseases are increased in alarming rate now-a-days due to increased incidence of patients with eye ailments, both due to premature ageing, life style modifications global lworking, and recent industrialisation, over usage of computers and electronic devices etc.,

Among 96 Siddha eye disease, . Most of them are premature ageing related disease.

The principle Aim is to evaluate the pathology of ‘Naga Padalam’ and to collected & review the view and ideas of the siddhars about this disease

a) Naga padalam is common in India and world wide distributed more prone in Equatorial regions
b) Common in all age groups but have higher incidence in aged ones

c) Uncontrolled persistence of disease worsen the vision and corneal astigmatism is more prove

Having these features in mind. The following objectives are enumerated

Objectives

Survey of siddha literature

a) Siddha physiology
b) Collection and detailed study of various eye books, regarding nagapadalam

Also dealing with definition aetiology, classification, signs and symptoms of disease, aggravating factors fate of the disease, line of treatment and diet interaction

- To expose the efficacy of siddhar diagnostic and surgical principle
- To list out incidence of the disease, with reference to Age, Sex, location, climates (paruvakaalam) the land in which the patient exist
- To know and corelate the features of Naga padam with that of modern medicines
- Diagnostic methods of medicine
- Importance of eye is an diagnostic tool
- To list out the relation of the disease with occupation, and his exposure to radiation
- Preventive methods and controlling procedures of eye disease
Sense organs and their corresponding pancha boothas

1. Ear - Ether
2. Skin - Air
3. Eye - Fire
4. Mouth - Water
5. Nose - Soil

Among the 5 sense organs, Eye is considered to be the best, by the ancient saying

‘அடலுடைய நீர்ந்த இருப்பிடங்கள்’

‘Eye’ is being compared to the ones ‘intelligence’

Factors which are responsible for eye disease in Intra uterine life

1. Altered food habits
2. Excessive drug intake
3. Excessive thirst and hunger
4. Intake of mangoes
5. Parasitic infections in pregnant mother

These are mentioned by Agastiyar. In his text Agathiya Nayana vithi as follows

114/ Lygiene

Also,

- Walking for a long distance
- Walking without chappals
- Disturbed sleep
- Visualizing lightining, fire
- Consuming vigear due drug Intercated periods
- Living in Excessive wind areas
- Lifting heavy weights in head
- சேர்ந்தளின் பராமரிப்பு யார்த்தமான மனித்து அயிர்த்துக்கண்டது

Concepts of Thirumoolar

- Intake of Arsenic products
- UTI
- STD
- Inhaling the corrosive drugs and acids
- Unvoiding the urine at appropriate time
- Excessive dehydration due to vomiting, diarrhoea

**Concepts of Nagamunivar**

Poem – 115
- Chicken pox
- Veneral disease
- UTI, STD
- Excessive heat

According to Thirumoolar

**Fate of vision**

35 to 45 years -  காரிய மூடு (Cloudiness of vision) or Blurring

45 to 57 years -  முன்னைல மூடு (Haziness of vision)

100 years -  முழுமையாய்க (Total Blindness)

**Song 115**

As per the ‘humans milestone’ the vision will be nil during the age of 100

To get protected from the ailments such as blurring of vision, loss of vision, are must follow the below procedures

1. Brushing with stems of Banayan, Jack fruit tree (or) Accacia
2. Santhira Tharisanam
   (Instill 3 drops of pure water and then, rub gently the eyelids and do the santhira tharisamam by folding hand as by “Palagani”)
3. Anjanam once in 3 days
4. Weekly Twice headbath is is must
5. Pala kirambu Pakkuva  பலர் கிராம்பு பாக்குவா is good
6. apply ghee in foot while going to bed Wash with chill H2O in easily morning and apply santalum paste, to the foot

These procedure particularly have cooling effect in both eyes

**Dietary regimen to prevent eye diseases**

1. Intake of Pannai keerai, பண்ணை கீரை, கீரைக்காய்க் Keerai is good
2. Add ghee twice a day song 117.

Applying oil in eyes will cure ear diseases
Applying oil in foots will cure eye diseases
also
Applying oil in centre of head will cure all ailments

14. Reflexes

Applying oil in eyes will cure ear diseases
Applying oil in foots will cure eye diseases
also
Applying oil in centre of head will cure all ailments

Song 279

- Slurring of speech
கலவி முதக்கும்

"ஒருநாள் தில்லி அரசநல் நிறைவுச் சடங்கு முதல் கற்றே நான் போட்டியில் பரவாட்டம் செய்தேன். முன்வரைப்பட்டியல் விளக்கும் ஆலை அடுக்கிக்கொண்டே,

சூச்சியின் புதுத் தினப்பகுதி காண்பதற்கு கேட்டுகளே மன்னருக்கு, நூற்று குறிப்பிட்டு நூற்று குறிப்பிட்டு நூற்று குறிப்பிட்டு நூற்று குறிப்பிட்டு

பணியிலிங்கம் சுற்றுக்கள்

தெருவில் புது மலர்கள் தோற்றத் தெளிவாய் "துடற்றார் 5 மலர்ப்பிட்டு"

தெருவா சுற்றுக்கள்:

அசையாக திரும்ப மூன்று கால்செடிகள் கலக்கிரமிகள் மின்னடைந்து, டார், புகழ்பெறும் ரீதாம்பிட்டுகள் நிறைந்து கலராக்கும் கால்களில்.

தெருவா சுற்றுக்கள்:

முன்னதானது, முன்னதானது முன்னதானது முன்னதானது

முன்னதானது - முன்னதானது

முன்னதானது - முன்னதானது

தெருவர் பிறிப்பு
<table>
<thead>
<tr>
<th>Related Terms</th>
<th>English Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Conjunctiva</td>
<td></td>
</tr>
<tr>
<td>2. Sclera</td>
<td></td>
</tr>
<tr>
<td>3. Cornea</td>
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<tr>
<td>4. Iris</td>
<td></td>
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<tr>
<td>5. Ciliary body</td>
<td></td>
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<td>6. Retina</td>
<td></td>
</tr>
<tr>
<td>7. Lens</td>
<td></td>
</tr>
<tr>
<td>8. Aqueous humour</td>
<td></td>
</tr>
<tr>
<td>9. Vitreous humour</td>
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* Related Terms and Definitions:
வணனை விளக்கம்

கல்லூரியாளர் சரிகாலம்

கல்லூரியாளர் பட்டியல் (கிளைகள்)

திற்புபொருள்: - 2 பட்டியல்
வெளிகுறிப்பு இலக்கியக்குறிப்பு: - 4 பட்டியல்

1. கீழ் பட்டியலில் குறிப்பிட்டு அலைவியலும் விளக்கின் வளைய திட்ட குறியீடுகளால் அலைவியல்கள்
2. பிரார்த்தனை தர்க்க தக்கத்தை
3. பிரார்த்தனை விளக்கப்பட்டு
4. தின தரமுறையால் அறாக்கால்

குறிப்பிட்டு கல்லூரியாளர் சிப்பி

குறிப்பிட்டு கல்லூரியாளர் பட்டியல்

பட்டியல் விளக்கம் குறிப்பிட்டு

நேரயும் மாதம் முதலிடும்

நேரயும் மாதம் கால்களிடையே உள்ள திற்புபொருள்

தேர்த்து பட்டியல் = 27
குறிப்பிட்டு பட்டியல் = 10

அத்தகைய அரசாக நேரயும் மாதம் கால்களிடையே

குறித்து பட்டியல் = 45
அுத்துச்சம்பு = 31
குறித்து பட்டியல் = 20
நேரயும் கால்களிடையே - 96

மாசக்குறிப்பிட்டு மூலம் பார்க்கும் பார்க்கும்

அத்துச்சம்பு தினம்

குறித்து அத்துச்சம்பு தினம்

தேர்த்து நேரயும் தினம் விளக்கம் விளக்கம் கால்களிடையே
கோன்னி வினைகள் அவை விருத்துக்கு முறையுடைய நழுவுகள்

கண்டு குறிப்பிட்டாள் பல நாட்களிலும் நிகழ்ச்சிகள்

இரண்டு பார்க்க உள்ளே

கோர்த்தியோலம் மறுமலர் காற்றோலம்.
CONJUNCTIVA IN VARIOUS SYSTEMIC DISEASE

- Conjunctivitis in Steven Johnson Syndrome
- Symblepharon in Cicatrical Phemphigoid
- Blue Sclera
- Conjunctival Kaposi Sarcoma