A STUDY ON
PAKKAVATHAM
(Hemiplegia)

Dissertation Submitted To

THE TAMIL NADU Dr. M.G.R. Medical University

Chennai – 32

For the Partial fulfillment for the Award of Degree of

DOCTOR OF MEDICINE (SIDDHA)

(Branch – III, SIRAPPU MARUTHUVAM)

DEPARTMENT OF SIRAPPU MARUTHUVAM

Government Siddha Medical College

Palayamkottai – 627 002.

OCTOBER - 2018

PALAYAMKOTTAI, TIRUNELVELI-627002,
TAMILNADU, INDIA.

Phone: 0462-2572736 / 2572737/ Fax:0462-2582010
Email: gsmc.palayamkottai@gmail.com

BONAFIDE CERTIFICATE

This is to certify that the dissertation entitled **"A STUDY ON PAKKAVATHAM"** is a bonafide work done by **Dr. R. KIRUBAKARAN (REG.NO: 321513003), GOVERNMENT SIDDHA MEDICAL COLLEGE, PALAYAMKOTTAI** in partial fulfillment of the University rules and regulations for award of **M.D (SIDDHA), BRANCH - III SIRAPPU MARUTHUVAM** under my guidance and supervision during the academic year **2015-2018 OCTOBER.**

Name and Signature of the Guide:

Name and Signature of the Head of Department:

Name and Signature of the Principal :

GOVERNMENT SIDDHA MEDICAL COLLEGE
PALAYAMKOTTAI, TIRUNELVELI-627002,
TAMILNADU, INDIA.

Phone: 0462-2572736 / 2572737/ Fax:0462-2582010
Email: gsmc.palayamkottai@gmail.com

DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation entitled **"A STUDY ON PAKKAVATHAM"** is a bonafide and genuine research work carried out by me under the guidance of **Dr. A. S. POONGODI KANTHIMATHI., M.D(s).,** Professor & HOD, PG - Department of Sirappu Maruthuvam, Govt. Siddha Medical College, Palayamkottai and the dissertation has formed the basis for the award of any Degree, Diploma, Fellowship or other similar title.

Date :

Place: Signature of Candidate

Dr. R. Kirubakaran

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GOVERNMENT SIDDHA MEDICAL COLLEGE, PALAYAMKOTTAI
TIRUNELVELI – 627 002
TAMIL NADU INDIA

Ph : 0462-2572736 / 2572737 / 2582010 Fax : 0462-2582010
Email ID : gsmc.palayamkottai@gmail.com

R.No.GSMC / 5676 / P&D / Res / IEC / 2014 **Date : 20.07.2016**

CERTIFICATE OF APPROVAL

Address of Ethical committee	Government Siddha Medical College Palayamkottai – 627002 Tirunelveli District
Principal investigator	Dr.R.KIRUBAKARAN. I Year PG Dept of Sirappu Maruthuvam Reg.No :
Supervisor &Guide	Dr.A.S.Poongodi kanthimathi. M.D (s) Professor &Head of the Department
Dissertation topic	An open clinical Study to evaluate the clinical efficacy of siddha sasthric formulation **"VISNU CHAKARA MATHIRAI"**(Internal) **"KODIVELI THYLAM"**for the treatment of **PAKKA VATHAM.**
Document field	1. Protocol2. Date Collection Form 3. Patient Information Sheet 4. Consent form5. SAE (Pharmacovigilance)
Clinical / Non Clinical trial Protocol	Clinical trial protocol – Yes
Informed consent document	Yes
Any other document	Case sheet, Investigation document
Date of IEC approval & it's Number	GSMC/3.IEC/2016/III-22/20.07.16

We approve the trial to be conducted in its presented form.

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

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A. Rajasekaran

Dr. A. Rajasekaran
Biological Scientist and IAEC Chairperson

PRINCIPAL
KMCH College of Pharmacy,
Kovai Estate, Kalapatti Road.
Coimbatore - 641 048.
Tamil Nadu, INDIA

KMCH College of Pharmacy ★ CPCSEA ★ Coimbatore - 641 035

17/2/18

Dr. D. Kannan
Main Nominee [CPCSEA]

GOVERNMENT SIDDHA MEDICAL COLLEGE

PALAYAMKOTTAI-627002

TAMILNADU,INDIA

Ph: 0462-2572736/2572737/fax:0462-2582010

Email id :gsmc.palayamkottai@gmail.com

CERTIFICATE OF GUNAPADAM AUTHENTICITY

Certified the following metals & mineral drugs used in siddha formulation **VISHNU CHAKRA MATHIRAI (INTERNAL)** for management of **PAKKAVATHAM(HEMIPLEGIA)** taken up for post-graduation dissertation studies by **Dr.R.KIRUBAKARAN M.D(S)., (REG.NO:321513003)** PG scholar, department of sirappu maruthuvam are correctly identified and authenticated through Visual inspection / Organoleptic characters / Experience, Education & Training morphology, microscopical and taxonomical methods.

METALS & MINERAL INGREDIENTS OF VISHNU CHAKRA MATHIRAI

S.NO	TAMIL NAME	ENGLISH NAME
1.	Purified Rasam	Mercury
2.	Purified Lingam	Natural cinnabar
3.	Purified Ganthagam	Sulphur
4.	Purified Thuththam	Zinc sulphas
5.	Purified Thalagam	Yellow arsenic
6.	Purified Kantham	magnet
7.	Purified Manosilai	Red orpiment

c	TAMIL NAME	ENGLISH NAME	ZOOLOGICAL NAME
1	Purified Palagarai	Marine shell	Cypraea moneta

Station:

Date: 14.06.17

Authorized signature 14/06/17

Dr. A. KINGSLY MD (S)
Reader
Head of the Department
PG Gunapadam
Govt. Siddha Medical College
Palayamkottai.

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PALAYAMKOTTAI-627002

TAMILNADU,INDIA

Ph: 0462-2572736/2572737/fax:0462-2582010

Email id :gsmc.palayamkottai@gmail.com

CERTIFICATE OF BOTANICAL AUTHENTICITY

Certified the following plant drugs used in siddha formulation **VISHNU CHAKRA MATHIRAI(INTERNAL) & KODIVELI THYLAM(EXTERNAL)** for management of **PAKKAVATHAM(HEMIPLEGIA)** taken up for post-graduation dissertation studies by **Dr.R.KIRUBAKARAN M.D(S)., (REG.NO:321513003)** PG scholar, department of sirappu maruthuvam are correctly identified and authenticated through Visual inspection / Organoleptic characters / Experience, Education & Training morphology, microscopical and taxonomical methods.

INGREDIENTS OF VISHNU CHAKRA MATHIRAI

S.NO	DRUGS	BOTANICAL NAME	FAMILY	PART USED
1.	Naabi	Aconitum napellus	Ranunculaceae	Root
2.	Vembu	Azadirachta indica	Meliaceae	Fruit

INGREDIENTS OF KODIVELI THYLAM

S.NO	DRUGS	BOTANICAL NAME	FAMILY	PART USED
1.	Kodiveli root	Plumbago zeylanica	Plumbagenaceae	Root
2.	Karunjeeragam	Nigella sativa	Ranunculaceae	Seed
3.	Thalisapathiri	Abies webbiana	Pinaceae	Leaf
4.	Thantrikkai	Terminalia bellirica	Combretaceae	Fruit rind

Station:

Date:

Authorized signature

Dr. S. SUTHA, M.Sc.,M.Ed.,Ph.D.,
Associate Professor
Dept. of Medicinal Botany
Govt. Siddha Medical College
Palayamkottai, Tirunelveli - 2.

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PALAYAMKOTTAI.

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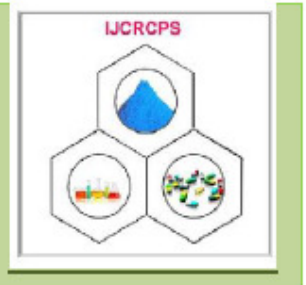

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Dr. Ganesan G[4] Dr. Vanamamalai R[5]

[1,2] PG student, Department of PG Sirappu Maruthuvam, Government Siddha Medical College, Palayamkottai, Tamil nadu, India

[3]Professor & HOD, Department of PG Sirappu Maruthuvam, Government Siddha Medical College, Palayamkottai, Tamil nadu, India

[4]Grade II Lecturer, Department of PG Sirappu Maruthuvam , Government Siddha Medical College , Palayamkottai Tamil nadu India

[5]Grade II Lecturer, Department of PG Sirappu Maruthuvam , Government Siddha Medical College, Palayamkottai, Tamil nadu, India

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[1, 2] PG Scholars, Department of PG Sirappu Maruthuvam
Government Siddha Medical College, Palayamkottai, Tamil nadu, India

[3]Professor & HOD, Department of PG Sirappu Maruthuvam
Government Siddha Medical College, Palayamkottai Tamil nadu, India

[4]Associate Professor, Department of PG Sirappu Maruthuvam
Government Siddha Medical College , Palayamkottai Tamil nadu, India

[5]Grade II lecturer, Department of PG Sirappu Maruthuvam,
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INTRODUCTION

அரிது அரிது மானிடராய் பிறத்தல் அரிது
அதனினும் அரிது கூன், குருடு, செவிடு, பேடு நீங்கி பிறத்தல் அரிது
அதனினும் அரிது ஞானமும் கல்வியும் நயத்தல் அரிது
அதனினும் அரிது தானமும் தவமும் செய்வது அரிது

- *ஔவையார்*

Human is wonderful creation of the nature. The ancient Tamil poet ovvaiyar said to be born a human is most venerable. From the above lines we well known have born with good health is a great gift of god.

"உடம்பார் அழியில் உயிரார் அழிவர்
திடம்பட மெய்ஞானம் சேரவும் மாட்டார்
உடம்பை வளர்க்கும் உபாயம் அறிந்தே
உடம்பை வளர்த்தேன் உயிர் வளர்த்தேனே."

- *திருமூலர் திருமந்திரம்*

Body and soul are bridge each other. If the body is disturbed, soul also disturbed. From this concept diseases are not affect only the body. It also affects the sole, so care about the good health is essential to live.

All the diseases are not occurring at birth, Diseases are caused by foods and daily activities. The following words said that,

".....கெடியான அறுசுவையின் பேதத்தாலும்
தாளப்பா தகாததம் நடக்கை யாலும்....."

YugiMooniver has classified 4448 as a result of the aforementioned causes. From the classification Siddhar yugi muniver has classified vatha diseases into 80 types in yugi vaithiya chinthamani 800. Pakkavatham is one among them.

The great crisis of the world is how to save the human race from extinction through degeneracy. Siddha medicine plays a vital role in presenting human life on the earth.

Siddha system of medicine not only classified the diseases, and he provide the medicine for cure that diseases. The siddhar yogi in his classification described eighty vatha diseases, fourty pitha diseases and twenty kaba diseases. Of this vatha disease pakkavatham, most of the clinical features (Inability to use one half of the body, loss of function of upper and lower limps, presence of circumduction gait, deviation of

mouth, difficulty to close the eyelids or partially closed, drolling of saliva, unable to speak) of pakkavatham in siddha medicinal aspect are closely bear a resemblance to that of “hemiplegia” in modern medical aspect.

Hemiplegia is the paralysis of one half of the body including upper and lower extremities due to opposite sided pyramidal lesion. When the face is affected the hemiplegia is called completeand when the face is affected the it is called incomplete hemiplegia, lesion is usually located below the level of pons. Most of the symptoms present in hemiplegia and those of pakkavatham are similar.

The author has selected pakkavatham which is explained under the vatha diseases by yogi munivar in yogi vaithiya chointhamani perunool-800. It is comparable to hemiplegia in modern medicine. The prevalence of this disease is now a day’s increasing due to lack of discipline schedule in everyday life and also increasing physical stress.

Since, ancient days, in the treatment of disease in siddha system first they use root and then leaves if it is not cured then they given medicines prepared from metals and minerals. Since hemiplegia is awful disease the author of this dissertation has selected the siddha formulation tablet prepared from the metal and mineral drugs.

The author choices of drugs for the clinical study are:

INTERNALLY:

VISHNU CHAKRA MATHIRAI

Ref : Siddha vaithiya thirattu

EXTERNALLY:

KODIVELI THYLAM

Ref : Gunapadam mooligai vaguppu

The drugs were prepared personally by the author and tried in 25 cases in the in-patients and another 13 patients in the out-patient ward. The success of this study depends on the doctor, the patient and the drug.

AIM AND OBJECTIVES

AIM:

To evaluate the therapeutic efficacy of siddha formulation **"VISHNU CHAKRA MATHIRAI" (INTERNAL)** and **"KODIVELI THYLAM" (EXTERNAL)** in **"PAKKAVATHAM" (HEMIPLEGIA)** for the ability to perform day to activities well.

OBJECTIVE:

Primary objective:

To evaluate the clinical efficiency of siddha drugs "**VISHNU CHAKRA MATHIRAI**" (Internal) and "**KODIVELI THYLAM"** (External) in "PAKKAVATHAM" (HEMIPLEGIA).

Secondary objective:

- To study the effect of Varmam and Thokkanam in the management of pakkavatham
- To examine the siddha basic principles like Envagai thervugal and modern clinical parameter.
- To bring out the biochemical analysis and pharmacological action of the trail drug.

REVIEW OF LITERATURE

SIDDHA ASPECT

Philosophies are the basic concet of siddha. According to this human body works on 96 philosophies. This 96 philosophies are classified into three catogories. The first and second categories contain 30 each, and third categoriy contain 36 philosophies. Among them the first thirty is considered very fundamental and the rest are the manifestation or extention of the first 30 philosophies. These are not only deals with the physical components of the human body but also the mental, logical components like passions qualities, knowledge, function of sence organs and motor organs and their co ordination.

The siddha system of medicine deals all part of science, when viewed in its appropriate prospective, the body is nothing less than an evolutionary speculate, an unbelievably complex instrument capable of supporting limitless possibilities for human life.

Siddha system based on five elements, which is the marvel nature can be studied from many points view , the conceptual model that "siddha" uses to understand the principles of nature functioning is called "pancha pootham" or the "the theory of five elements" and 96-thathuvams, three humours and seven thathus. Normally the thathus(vatham, pitham, kabam) are present as a normal ratio in the body. When alteration in the thathus that produce disease in the body.

According to yogi vaithiya chintamani perunool – 800 vadha diseases are 80 in numbers. Pakkavathem is one of the vatha disease. So , before evaluating the pakkavatham, evaluating the features of vatham is essential.

VATHAM

Otherwise known as - vatham, vayu

Natural properties of vatham:

- Functioning the mind
- Inspiration and expiration
- Briskness
- Functioning the seven udal kattukal uniformly

QUALITIES OF VATHAM:

OWN QUALITIES:

Kadinam	Rough
Varatchi	Dry
Elesu	Light
Kulirchi	Cold
Asaidhal	Unstable
Anuthuvam	Subtle

OPPOSITE QUALITIES:

Miruthu	Soft
Pasumai	Unctuous
Paluvu	Heavy
Akkini	Hot
Sthiram	Stable
Katti	Solid

RELATION WITH TASTE:

புளிதுவர் விஞ்சுங் கறியார் பூரிக்கும் வாதம்.....

The taste which increases vathum are,

- sour
- astringent

வாதம் மேலிட்டால் மதுரம் புளியுப்பு.....

The Taste which neutralizes wathem are,

- Sweet
- Sour
- salt

PATHOPHYSIOLOGY :

The arouse vathum has the following symptoms.

- Body pain
- Tearing and pricking pain
- Nerve weakness
- Shivering
- Dryness
- Dislocation of joints
- Weakness of organs
- Polydypsia
- Limbs paralysis
- Constipation
- All tastes is like to be an astringent
- Excessive salivation
- Darkness of skin
- Mental illness
- Difficulty or inability to do flexon and extention of the limbs

CLASSIFICATION:

Vatham is classified into ten types.

- Piranan
- Abanan
- Udhanan
- Viyanan
- Samanan
- Nagan
- Koorman
- Kirukaran
- Dhevathathan
- Dhananjeyan

Among 10 types of vatham, five types are very important and its controls essential body functions.

- Pranan – controls circulation
- Abanan – controls excretion
- uthanan – controls breathing and speech
- viyanan – controls will
- Samanan – control digestion

ETIOLOGY:

"என்னவே வாதந்தா னெண்பதாகும்
இகத்திலே மனிதர்களுக் கெய்யுமாறு
பின்னவே பொன்தனையே சோரஞ்செய்து
பெரியோர்கள் பிராமணரைத் தூடணித்தும்
வன்தேவச் சொத்தில் சோரஞ்செய்து
மாதா பிதா குருவை மறந்த பேர்க்கும்
கன்னவே வேதத்தை நிந்தை செய்தால்
காயத்திற் கலந்திடுமே வாதந் தானே"

- **யூகி வைத்திய சிந்தாமணி பாடல் - 243**

"தானென்ற கசப்போடு துவர்ப்புறைப்பு
சாதகமாய் மிஞ்சிகிலும் சமைத்த வண்ணம்
ஆனென்ற வாறினது புசித்தாலும்
ஆகாயத் தேறலது குடித்த லாலும்
பானென்ற பகலுறக்க மிரா விழிப்பு
பட்டினியெ மிகவுறுதல் பாரமெய்தல்
தேனென்ற மொழியார் மேற் சிந்தையாதல்
சீக்கிரமாய் வாதமது செனிக்குந் தானே"

- **யூகி வைத்திய சிந்தாமணி – பாடல் 244**

"வாதவர்த்தி தனைகால மேதோ வென்னில்
மருவுகின்ற வாணிகர்க் கடகமாகும்
ஆதவைப் பசியோடு கார்த்திகை தன்னில்
அடருமே மற்றமா தங்கள் தன்னில்
போதவே சமிக்குகின்ற காலமாகும்".

- **யூகி வைத்திய சிந்தாமணி – பாடல் 245**

“ஆனான வரன்றனையே மதியா மாந்தர்
அகதி பரதேசியர்கட் கன்ன மீயார்
கோனான குருமொழியை மறந்த பேர்கள்
கொலை களவு பொய் காமங் குறித்த பேர்க்கு
ஊனான சடந்தன்னில் வாதம் வந்து
உற்பவிக்கும் வேதத்தின் உண்மைதானே”

- **யூகி வைத்திய சிந்தாமணி – பாடல் 253**

“பகரவே வாதமது கோபித்தப்போ
பண்பாகப் பெண்போகமது தான் செய்யில்
நகரவே வெகுதூர வழி நடக்கில்
நளிரான காற்றுமே பனிமேற்பட்டால்
மிகரவே காய்கள் கனி கிழங்கு தன்மை
மிக வருந்தி மீறியே தயிர்தான் கொண்டால்
முகரவே முதுகெலும்பை முறுக்கி நொந்து
முழங்காலும் கணைக்காலும் கடுப்பு உண்டாகுமே”

- **யூகி வைத்திய சிந்தாமணி – பாடல் 245**

PAKKAVATHAM

Pakkavatham is one of the vatha disease , and the name is derived from the classical feature of the disease (It has a specific symptom of disability or inability to use upper and lower limbs of one half of the body).

Yougi muniver classified and describe the vatha diseases into 80 types. Pakkavatham is one on it. And he clearly speaks about the clinical manifestations of the disease. The following literature evidence from the yugi vaithiya chinthamani 800 clearly describe that,

Sign and Symptoms of pakkavatham:

In yugi vaithiya chinthamani perunool-800 described the sign and symptoms are follows

உண்மையா யுடம்பெல்லாம் வாயு வாகி
உயர்கின்ற நாடியது அசைவு மின்றிக்
கண்மையாய்க் காயமீ தினிலே யேறிக்
கசக்கியே யிழிந்துமே வலித்துக் காணும்
பண்மையாய்ப் பக்கத்தி லிசிவு முண்டாய்ப்
பாரித்துப் பணைக்கையுங் காலுங் கோணும்
வெண்மையா யுடம்பெங்கும் வியர்வை காணும்
மெலிவுபக்க வாதத்தின் விவரந் தானே.

- Total or fractional loss of power one side of limb.
- Body pain
- Difficulty in walking
- No hand grip
- Piloerection and paresthesia over the affected limbs
- Excessive sweating
- Rigidity over the hand and leg

In “thanvanthiri vaithiyam” are described as follows

ஒரு புறம் வாயுத்தானே வுயர்ந்து புறத்திலுள்ள
சீரைகுடற் வற்றியிந்தப் பாகதடதை யயரச் செய்து
தருவிழி மூக்கு காது சரணம் நாத் தாழ்ந்தயர்ந்து
மருவிய குணங்கள் பக்கவாதத்தின் மகிமை தானே.

Thanvanthri vaithiyam – 21

- ❖ Loss of power in all muscles of one side of the body
- ❖ There is also deviation of mouth
- ❖ There is obliteration of nasolabial fold
- ❖ The eyes also involved with paralysis of muscles of eye
- ❖ There is also dysarthria

வாத கன்ம வரலாறு

"நூலென்ற வாதம் வந்த வகைதானேது
நுண்மையாயக் கன்மத்தின் வகையைக் கேளு
காலிலே தோன்றியது கடுப்பதேது
கைகாலில் முடக்கியது வீக்கமேது
கோலிலே படுகின்ற விருட்சமான
குழந்தை மரந்தன்னை வெட்டல் மேல்தோல் சீவல்
நாவிலே சீவசெந்து கால்முறித்தல்
நல்ல கொம்பு தாழை முறித்தல் நலித்தல் காணே"

- **அகத்தியர் கன்ம காண்டம் -300 பாடல் 56**

Many diseases are said to be precipitated by kanma which means the deeds good or bad committed by an individuals in his previous and the present birth

vatha diseases, according to agasthiyar kanma kandam – 300 may also be precipitated by kanmma.

DIAGNOSIS:

Piniyari muraigal (method of diagnosis) is based upon three main principles,

1. பொறியாற்றேர்தல்
2. புலனாலறிதல்
3. வினாவுதல்

1. பொறியாற்றேர்தல் (Inspection)

1. மூக்கு
2. நா (வாய்)
3. கண்
4. தோல் (மெய்)
5. செவி

Poriyal arithal means examining the pori of the patient by the physician for proper diagnosis.

GNANTHRIYAM

S.No.	Gnani	Physiological function	Features in pakkavatham
1.	Mei	Feels the sensation of touch	Affected (parasthesia present in upper limb)
2.	Naa	Analyses taste	Affected (Tastelessness)
3.	Kan	For vision	Affected (Diplopia, Blindness)
4.	Mooku	For smell	Not affected
5.	Sevi	For hearing	Not affected

KANMENTHIRIYAM:

S.No.	Kanmenthiriyam	Physiological function	Features in pakkavatham
1.	Kai	For Handle the things	Affected (difficulty or inability to use right or left hand)
2.	Kal	For Walking	Affected (difficulty or inability to use right or left leg)
3.	Vaai	For speaking	Affected (Deviation of angle of mouth)
4.	Eruvaai	For defaecation	Affected (incontinence of urine may present)
5.	Karuvaai	For reproduction	Not affected

2. புலனாலறிதல்

1. நாற்றம் (மணம்)
2. சுவை
3. ஒளி
4. ஊறு
5. ஓசை

மருத்துவர் ஐம்புலன்களைக் கொண்டு நோயை கணிக்க முடியும்.

3. வினாவுதல்

மருத்துவர் நோயாளியிடம் வினாவுதல் மூலம் நோயை கணிக்கமுடியும். நோயாளியால் பேச முடியாத நேரத்தில் அவன் சுற்றத்தாரிடமும் வினாவுதல் மூலம் நோயை கணிக்கமுடியும்.

Envagai Thervugal :

Naadi, sparisam, naa, niram, mozhi, vizhi, malam, moothiram.

Naadi (pulse)

"கண்டாயோ சிலேற்பனத்தில் வாத நாடி
கலந்திடுகில் வயிறு பொருமல் கனத்த வீக்கம்
உண்டாலோ ஓங்காரஞ் சத்தி விக்கல்
உறுதிரட்சை வாய்வுவலி சந்நி தோடம்
யிண்டாலே இளைப்பிருமல் சோபை பாண்டு
விடபாகம் விடசூலை பக்க வாதம்
கிண்டாடு நாசிகா பீடங் கக்கல்
சிரநோய்கள் பலவும்வந்து சிக்குந் தானே."

Vitiated vatha causes difficulty in walking or impaired function of lower extremities. The examination of naadi has been recognised as one of the principle means of diagnosis and prognosis of disease from times immemorial.

In pakkavatham normal 1:1/2:1/4 mathirai pattern or animal gait pattern of Hen, turtle, frog of vatham, pitham, kabam is affected giving rise to elevated mathirai of kabam and vatham than normal.

Sparisam (skin)

In pakkavatham the temperature may be raised , but in long standing residual paralysis there may be subnormal temperature.

Naa (Tongue)

In pakkavatham the patient may have lost taste sensation

Niram (colour)

In pakkavatham no abnormality is seen I niram. But it is noted to confirm the predominant uyir thathu involved

Mozhi (Speech)

In pakkavatham the patient may have slurring speech, aphasis or dysarthria

Vizhi (Eye)

The patient may have defective closure of eyelid due to muscle paralysis. There may be loss of vision or double vision.

Malam (stools)

In patcha vatham the amount of faeces is reduced. The consistency becomes hard due to vitiation of vatham

Moothiram (urine)

மூத்திரம்

- நீர்க்குறி
- நெய்க்குறி

நீர்க்குறி

"அருந்துமாறி ரதமும் அவிரோதமாய்
அ.ர்கல் அலர்தல் அகாலவூன் தவிர்ந்தழற்
குற்றளவருந்தி உறங்கி வைகறை
ஆடிக் கலசத் தாவியே காதுபெய்
தொரு முகூர்த்தக் கலைக்குட்படு நீரின்
நிறக்குறி நெய்க்குறி நிருமித்தல் கடனே"

- **நோய்நாடல் நோய்முதல்நாடல் பகுதி – I**

உண்ணுகின்ற அறுசுவைப் பொருள்களும் ஒன்றுக்கொன்று வேற்றுமையடையாமலும், பசிக்குத் தக்கபடி குறைதல், அதிகரித்தல் காலந்தவறி உண்ணுதல் முதலிய குற்றங்களுண்டாகா வண்ணம் புசித்து உறங்கி, விடியற்காலத்தில் படிக பாத்திரத்தில் பெய்த நீரை ஆவிபோகாதபடி 3 ¾ நாழிகைக்குள் அதன் நிறக்குறியையும் அதில் எண்ணெய்விட்டுப் பார்த்து காணப்படுகின்ற குறியையும் கவனித்து பிணிகளின் தீரும், தீராக் குறிகளை அறியலாம்.

சிறுநீரின் பொதுக்குணம்

"வந்த நீர்க்கரிஎடை மணம் நுரைஎஞ்சலென்
றைந்தியலுளவவை யறைகுது முறையே"

- **நோய்நாடல் நோய் முதல்நாடல்பகுதி – I**

இயற்கை நீர் இலக்கணம்

"மிகத் தடிப்பும் மிகத் தேறலும் இன்றெனில்
சுகத்தைத் தரும் மெய்சுபாவ நீர் நன்றே"

- **தேரன் நீர்க்குறி நெய்க்குறி**

According to theriyar, urine should be of low density and with discoloration. In cegana vatham, urine is yellow colour with low density.

நெய்க்குறி

"நிறக்குறிக் குரைத்த நிருமான நீரிற்
சிறக்க வெண்ணெய்பொர் சிறுதுளி நடுவிடுத்
தென்றுறத் திறத்தொலி யேகாதமைத்ததி
னின்ற திவலை போம் நெறிவிழியறிவும்
சென்றது புகலுந் செய்தியை யுணரே"

- **நோய்நாடல் நோய்முதல்நாடல் பகுதி – I**

நீர்நிறக் குறியால் நோயைக் கண்டு பிடித்தற்பொருட்டுச் சொல்லியிருக்கின்ற விதி பொருந்திய சிறுநீரில் ஒரு சிறியதுளி எண்ணெய் நடுவில் கையசைவினால் எண்ணெய்துளி சிதறாமல் விட்டு வெய்யிலானது அந்நீரில் படும்படி திறந்து காற்றானது அதில் வீசி அந்த எண்ணெய்த் துளி ஆடாதபடி வைத்து அச்சிறுநீரில் விடப்பட்டிருக்கின்ற எண்ணெய்த் துளியானது செல்லுகின்ற வழியில் கண்ணறிவையும் உயிரறிவையும் செலுத்தி, அத்துளி தெரிவிக்கும் நோய் விளக்கத்தை நீ தெரிந்து கொள்ளலாம்.

"அரவென நீண்டின.்.தே வாதம்"
ஆழி போற்பரவின் அ.்.தே பித்தம்"
முத்தொத்து நிற்கின் மொழிவதென் கபமே"

- **நோய்நாடல் நோய் முதல்நாடல் பகுதி-I**

In pakkavatham patients during neikuri examination the oil spreads like snake and sometimes like ring and pearl.

UYIR THATHUKKAL

Vatham

- Pranan:

Physiological function: Inspiration and expiration responsible for sneezing coughing and belching

Features in Pakkavatham: Not affected

- Abanan:

  Physiological function: Act with downward movement

  Features in Pakkavatham: Affected (constipation present).

- Viyanan:

  Physiological function: Helps in various movements of body, responsible for sensation

  Features in Pakkavatham: Affected difficulty to use right or left upper limb or lower limb.

- Udhanan:

  Physiological function: Regulates the higher functions of brain. Responsible for physiological reactions like hiccough and vomiting

  Features in Pakkavatham: Not affected

- Samanan:

  Physiological function: Regulates all other vayus

  Features in Pakkavatham: Affected (Difficulty to control other vayus).

- Nagan:

  Physiological function: Responsible for intelligence helps in opening and closing of eyes

  Features in Pakkavatham: Affected in aged patients. Acuity of vision is diminished.

- Koorman:

  Physiological function: Responsible for lacrimation. Helps to visualization of all things in the world.

  Features in Pakkavatham: Affected in aged patients. Acuity of vision is diminished.

- Kirugaran:

  Physiological function: Yawning, Drippling of Saliva.

  Features in Pakkavatham: Affected (Drippling of Saliva).

- Thevathathan:

  Physiological function: Responsible for laziness. Rotation of eyeballs

  Features in Pakkavatham: Affected (Sleeplessness, fatigue).

- Thananjeyan:

  Physiological function: Responsible for tinnitus oedema.

  Features in Pakkavatham: Not affected

Pitham

- Anar pitham:

  Physiological function: Digests all the ingested particles.

  Features in Pakkavatham: Affected (Anorexia present in some patients)

- Ranjaga pitham:

  Physiological function: Increases the blood and gives blood colour

  Features in Pakkavatham: Affected (Reduced haemoglobin level).

- Saathaga pitham:

  Physiological function: Makes the work to complete what mind thinks to do

  Features in Pakkavatham: Affected (Difficulty to use upper limb and lower limb

- Aalosaga pitham:

  Physiological function: Responsible for clear vision.

  Features in Pakkavatham: Affected in old age peoples.

- Prasaga pitham:

  Physiological function: Gives colours to skin

  Features in Pakkavatham: Not affected

Kabam

- Avalambagam:

  Physiological function: Controls other 4 types of kabam

  Features in Pakkavatham: Affected (santhigam affected)

- Klethagam:

  Physiological function: Moistens the food

  Features in Pakkavatham: Not affected

- Pothagam:

  Physiological function: Helps to know the taste

  Features in Pakkavatham: Not affected

- Tharpagam:

  Physiological function: Gives cooling effect to the eyes

  Features in Pakkavatham: Not Affected.

- Santhigam:

  Physiological function: Gives lubrication to joints

  Features in Pakkavatham: Affected (pain in cervical region)

SEVEN PHYSICAL CONSTITUENTS OF BODY

- Saaram:

  Physiological function: Strengthens the body and mind

  Features in Pakkavatham: Tiredness and mental depression

- Senneer:

  Physiological function: Preserves brightness, boldness, power& knowledge

  Features in Pakkavatham: weakness of the nerve

- Oon:

  Physiological function: Gives structure and shape to the body.

  Features in Pakkavatham: Acute stage - There is hypotonicity

  Later stage - There is hypertonicity

- Kozhuppu:

  Physiological function: Responsible for movement lubricants the joint

  Features in Pakkavatham: pain in affected side

- Enbu:

  Physiological function: Responsible to joint movements

  Features in Pakkavatham: weak bones

- Moolai

  Physiological function: Present inside the bones and gives strength to the bones

  Features in Pakkavatham: Weakness of nerves

- Sukkilamor suronitham:

  Physiological function: _

  Features in Pakkavatham: due to above 6 udalkattugal affected

GNANTHRIYAM

- Mei:

  Physiological function: Feels the sensation of touch

  Features in Pakkavatham: Affected (Parasthesia may present in upper limb and lower limb)

- Naa:

  Physiological function: Analyses taste

  Features in Pakkavatham: Not affected

- Kan:

  Physiological function: For vision

  Features in Pakkavatham: Not affected

- Mooku:

  Physiological function: For smell

  Features in Pakkavatham: Not affected

- Sevi :

  Physiological function: For hearing

  Features in Pakkavatham: Not affected

Kanmenthiriyam

- Kai

  Physiological function: Handling the objects.

  Features in Pakkavatham: there is loss of function of one side of upper limb

- Kal

  Physiological function: Walking

  Features in Pakkavatham: loss of function of one side of lower limb

- Vaai

  Physiological function: For speaking

  Features in Pakkavatham: Loss of function of speech

- Eruvaai

  Physiological function: For defaecation and maturation

  Features in Pakkavatham: There is loss of bladder control

- Karuvaai

  Physiological function: For reproduction

  Features in Pakkavatham: May not have loss of libido

THINAIGAL

- Kurinji:

  Place: Mountain and its surroundings

  Common diseases : Kabanoi liver disease are common

- Mullai :

  Place: Forest and its surroundings

  Common diseases: Pitha and vatha disease liver disease and common

- Marutham:

  Place: Field and its surroundings

  Common diseases: Safest place to maintain good health

- Neithal:

  Place: Sea and its surroundings

  Common diseases: Vatha disease and liver enlargement are common

- Paalai:

  Place: Desert and its surroundings

  Common diseases: Vatha pitha and kabha disease and common

  Most of the patients came from Marutha nilam. Patients were also reported from neithal nilam.

Paruva Kaalangal

- Kaarkaalam

  Aavani and Purattasi(August 16 – October 15)

  Kuttram- Vatham ↑ ↑Pitham ↑

- Koothirkaalam

  Ayppasi and karthigai(October16 – December15)

  Kuttram - Vatham (-)Pitham ↑ ↑

- Munpanikaalam

  Maargali and Thai(December 16 – February 15)

  Kuttram- Pitham (-)

- Pinpanikaalam

  Maasi and Panguni(February 16 – April 15)

  Kuttram- Kabam ↑

- Elavenilkaalam

  Aani and Aadi(April 16 – June 15)

  Kuttram- Kabam ↑↑

- Muduvenilkaalam

  Aani and Aadi(June 16 - August 15)

  Kuttram- Vatham ↑Kabam (-)

NOI KANIPPU VIVATHAM:

Pakkavatham should not be confused with other types of vatham which have more or less similar symptoms.

ஊரகத வாதம்:

அற்புதமாய் நோவாகிப் புருவங் காது
அங்கத்திற் பாதிதான் வலித்தெப் போதுந்
தற்புதமாய் கோணியே தலையும் வாயுந்
தாவவே மிகநடுங்கிக் குளிர்ந்து கூசும்
விற்புதமாய் விழிகளுந்தான் மிமைப்பு றாது
மெலிவாகிச் சரீரமெலாம் வியர்வை யாகும்
புற்புதமாய் வாய்நீரு மிகவே யூறும்
புகலுமோ ருரகவா தந்தின் பேரே.

The clinical features are:

- Eyebrow,ear and half of the body are painfull
- Paralysis occurs rarely in one half of the body
- Involuntary movement of head and mouth
- Chillness, tingling sensation of the body
- Excess salaivation

அற்புத வாதம்:

தீர்க்கமாய் ஸ்திரீசங்கம் பண்ணும் போதுந்
திடுக்கெனவே வார்த்தைகோ பித்த போதும்
ஊர்க்கமா யுறத்துதான் பாடும் போதும்
உண்ணுமவல் கச்சாயம் பாக்குத் தானும்

ஆர்க்கமாய்த் தட்டியே கடித்த போது
முழகான முகந்தன்னில் வாயு கோபித்
தார்க்கமாய் மிகச்சிதறி வாயுங் கோணுஞ்
சாங்கமா யற்புதவா தந்தா னாமே.

The clinical features are:

- vatham habitually exaggerated during intercourse, getting angry, singing loudly, chewing betal nut, threatening and scolding others
- exaggerated vatham leads to the paralysis and deviation of mouth

TREATMENT OF PAKKAVATHAM:

In siddha system of medicine the main aim of the treatment is exclusion of udalpinigal(due to alteration of udalthathukkal and uyir thathukkal) and ulappinigal. Treatment is not only for removal of disease but for the prevention and improving the body condition also.

This said as follows

- Kaapu
- Neekam
- Niraippu

"Study the disease emissary the cause
Seek subsiding ways and do what is proper and effective"

"The man well versed in medical lore, would measure the patient,
Disease and time before the healing work begins"

Thirukkural

So, it is essential to know the cause of the disease nature of the patient severity of illness, the seasons and time of occurrence.

TREATMENT:

LINE OF TREATMENT:

The line of treatment consist of

1. The purgative drugs must be given first to compensate the vitiated vadham.
2. Medicines – internal and externals are to be given for affected uyir thathukkal and udal thathukkal
3. The sirappu maruthuvam

   Thokkanam must be done after application of oil for the strengthening the affected part

   Varmam are also applied as supportive therapy for quick recovery
4. The food and habits, which are avoiding and adding, are also determined clearly
5. Kanma neekam apart of treatment and it must also be done properly before the treatment

PURGATIVE:

விரேசனத்தால் வாதந் தாழும் .....

Vellai ennai- 15 ml at early morning is given one day before starting the main treatment given for patients.

MEDICINES:

Pakkavatham treated with internal as well as external medicines

Internal medicine:	Vishnu chakra mathirai- 130 mg twice a day with Thirikadugu choornam + Inji juice + Honey
External medicine:	kodiveli thylam

COMPLIMENTARY THERAPIES:

Aparts from other departments, Sirappu maruthuvam department gives equal importance to complimentary therapies along with internal and external treatments. Many complimentary therapies used to treat the diseases in siddha like varmam., ect

The Following two complimentary therapies used for this study

1. Thokkanam
2. Varmam

VARMAM:

Varmam is a branch of siddha medicine. It is one of the ancient south indian priceless living heritage. Varma is a point where prana exists. An equilibrium of this points contributes to good health. If any varma points are derive insane or affected the related limbs or part of the body get afflicted, causing particular problem.

The varma points are distributed all over the body. It is mainly classified as

- Padu varmam - 12
- Thoduvarmam – 96

Varma points to be manipulated for hemiplegia are as follows:

- Vilangu varmam
- Kai Kavali
- Kondaikolli varmam
- Ullangai vellai
- Kuthirai muga varmam
- Aamai kalam
- Kaal kavali

MASSAGE THERAPHY:

- Thattal
- Pidithal
- Izhuthal
- Asithal

வாதம் முதலிய முக்குற்ற பிணிகள் உண்டாக்கும் வலியை வெறுங்கையாலோ (அ) தைலம் தடவியோ பிடிப்பது.

தொக்கணத்தி னாலிரத்தந் தோல்ஊ ணிவைகட்கு
மிக்கு சவுக்கியஞ்ச மீரணும்பொ – மெய்க்கதிக
புட்டியுறக்கம் புணர்ச்சி யிவை கதிக்கும்
பட்ட அலைச்சலறும் பார்"

- தேரன்

பிடித்தல்

"பிடித்தலி யங்கும் மைதியி னுந்தகும் பிந்தாதே – எண்ணெ
யுடுத்தது செய்யிற் றசவளி யூனுட லுந்தாதே
வேற்றது செய்யினுஞ் சூசிகை பாரிசை விட்டோடும் - புலி
போற்றது வாயுவு மற்றுது மேனலிப் பொட்டோடும்"

தொக்கணம் செய்யக்கூடிய 5 நிலைகளிலும் செய்யலாம்.

தைலம் தடவியோ, தடவாமலோ பிடித்துவிட வாத நோய்களுக்கு சிறப்பாக பொருந்தும்.

இழுத்தல்

இழுத்தல் கிடத்த லிருத்த லிரண்டிற்கு மேராமே – என்பில்
முழுத்தது வண்ணுகங் கானமந் தக்கதி சீராமே
உருவுத லென்பது மித்தோழி லேநேரம் பூறாகி – மனம்
வெருவுறு மூன வினைகளை மெய்யடு வேறாகி
வளக்குறு மெண்ணெய் லேயிது செய்வது வல்லாண்மை – உடற்
களக்களுர் போக்கச் சுளுக்கென வாவதித் தொல்லாண்மை"

இதை தைலத்தை பூசியே செய்யவேண்டும். எலும்புகள் நன்றாய்த் தெரியுமிடங்களிலும், தலையிலும் உருவும்போது மந்தமாக செய்யவேண்டும்.இதனால் நரம்பில் ஊறி வறுத்துகின்ற வாயுக்கள், பிடிப்புகள், சுளுக்குகள் குணமாகும்.

MODERN ASPECT

The human brain is the command center for the human nervous system. It receives input from the sensory organs and sends output to the muscles. The human brain has the same basic structure as other mammal brains, but is larger in relation to body size than any other brains.

FACTS ABOUT THE HUMAN BRAIN

- The human brain is the largest brain of all vertebrates relative to body size
- It weighs about 3.3 lbs. (1.5 kilograms)
- The brain makes up about 2 percent of a human's body weight
- The cerebrum makes up 85 percent of the brain's weight
- It contains about 86 billion nerve cells (neurons) — the "gray matter"
- It contains billions of nerve fibers (axons and dendrites) — the "white matter"
- These neurons are connected by trillions of connections, or synapses

ANATOMY OF THE BRAIN

There are different ways of dividing the brain anatomically into regions. Let's use a common method and divide the brain into three main regions based on embryonic development: the forebrain, midbrain and hindbrain. Under these divisions:

- The **forebrain** (or *prosencephalon*) is made up of our incredible cerebrum, thalamus, hypothalamus and pineal gland among other features. Neuroanatomists call the cerebral area the *telencephalon* and use the term *diencephalon* (or interbrain) to refer to the area where our thalamus, hypothalamus and pineal gland reside.
- The **midbrain** (or *mesencephalon*), located near the very center of the brain between the interbrain and the hindbrain, is composed of a portion of the brainstem.
- The **hindbrain** (or *rhombencephalon*) consists of the remaining brainstem as well as our cerebellum and pons. Neuroanatomists have a word to describe the brainstem sub-region of our hindbrain, calling it the *myelencephalon*, while they use the word *metencephalon* in reference to our cerebellum and pons collectively.

Before exploring these different regions of the brain, first let's define the important types of cells and tissues that are the building blocks of them all.

HISTOLOGY

Brain cells can be broken into two groups: neurons and neuroglia.

Neurons, or nerve cells, are the cells that perform all of the communication and processing within the brain. Sensory neurons entering the brain from the peripheral nervous system deliver information about the condition of the body and its surroundings. Most of the neurons in the brain's gray matter are interneurons, which are responsible for integrating and processing information delivered to the brain by sensory neurons. Interneurons send signals to motor neurons, which carry signals to muscles and glands.

Neuroglia, or glial cells, act as the helper cells of the brain; they support and protect the neurons. In the brain there are four types of glial cells: astrocytes, oligodendrocytes, microglia, and ependymal cells.

- *Astrocytes* protect neurons by filtering nutrients out of the blood and preventing chemicals and pathogens from leaving the capillaries of the brain.
- *Oligodendrocytes* wrap the axons of neurons in the brain to produce the insulation known as myelin. Myelinated axons transmit nerve signals much faster than unmyelinated axons, so oligodendrocytes accelerate the communication speed of the brain.
- *Microglia* act much like white blood cells by attacking and destroying pathogens that invade the brain.
- *Ependymal cells* line the capillaries of the choroid plexuses and filter blood plasma to produce cerebrospinal fluid.

The tissue of the brain can be broken down into two major classes: gray matter and white matter.

- *Gray matter* is made of mostly unmyelinated neurons, most of which are interneurons. The gray matter regions are the areas of nerve connections and processing.
- *White matter* is made of mostly myelinated neurons that connect the regions of gray matter to each other and to the rest of the body. Myelinated neurons transmit nerve signals much faster than unmyelinated axons do. The white matter acts as the information highway of the brain to speed the connections between distant parts of the brain and body.

Now let's begin exploring the main structures of our awesome human brain.

HINDBRAIN (RHOMBENCEPHALON)

BRAINSTEM

Connecting the brain to the spinal cord, the brainstem is the most inferior portion of our brain. Many of the most basic survival functions of the brain are controlled by the brainstem.

The brainstem is made of three regions: the medulla oblongata, the pons, and the midbrain. A net-like structure of mixed gray and white matter known as the reticular formation is found in all three regions of the brainstem. The reticular formation controls muscle tone in the body and acts as the switch between consciousness and sleep in the brain.

The *medulla oblongata* is a roughly cylindrical mass of nervous tissue that connects to the spinal cord on its inferior border and to the pons on its superior border. The medulla contains mostly white matter that carries nerve signals ascending into the brain and descending into the spinal cord. Within the medulla are several regions of gray matter that process involuntary body functions related to homeostasis. The cardiovascular center of the medulla monitors blood pressure and oxygen levels and regulates heart rate to provide sufficient oxygen supplies to the body's tissues. The medullary rhythmicity center controls the rate of breathing to provide oxygen to the body. Vomiting, sneezing, coughing, and swallowing reflexes are coordinated in this region of the brain as well.

The *pons* is the region of the brainstem found superior to the medulla oblongata, inferior to the midbrain, and anterior to the cerebellum. Together with the cerebellum, it forms what is called the *metencephalon*. About an inch long and somewhat larger and wider than the medulla, the pons acts as the bridge for nerve signals traveling to and from the cerebellum and carries signals between the superior regions of the brain and the medulla and spinal cord.

CEREBELLUM

The cerebellum is a wrinkled, hemispherical region of the brain located posterior to the brainstem and inferior to the cerebrum. The outer layer of the cerebellum, known as the cerebellar cortex, is made of tightly folded gray matter that provides the processing power of the cerebellum. Deep to the cerebellar cortex is a tree-shaped layer of white matter called the arbor vitae, which means 'tree of life'.

The arbor vitae connects the processing regions of cerebellar cortex to the rest of the brain and body.

The cerebellum helps to control motor functions such as balance, posture, and coordination of complex muscle activities. The cerebellum receives sensory inputs from the muscles and joints of the body and uses this information to keep the body balanced and to maintain posture. The cerebellum also controls the timing and finesse of complex motor actions such as walking, writing, and speech.

MIDBRAIN (MESENCEPHALON)

The midbrain, also known as the mesencephalon, is the most superior region of the brainstem. Found between the pons and the diencephalon, the midbrain can be further subdivided into 2 main regions: the tectum and the cerebral peduncles.

- The *tectum* is the posterior region of the midbrain, containing relays for reflexes that involve auditory and visual information. The pupillary reflex (adjustment for light intensity), accommodation reflex (focus on near or far away objects), and startle reflexes are among the many reflexes relayed through this region.
- Forming the anterior region of the midbrain, the *cerebral peduncles* contain many nerve tracts and the substantia nigra. Nerve tracts passing through the cerebral peduncles connect regions of the cerebrum and thalamus to the spinal cord and lower regions of the brainstem. The substantia nigra is a region of dark melanin-containing neurons that is involved in the inhibition of movement. Degeneration of the substantia nigra leads to a loss of motor control known as Parkinson's disease.

FOREBRAIN (PROSENCEPHALON)

DIENCEPHALON

Superior and anterior to the midbrain is the region known as the interbrain, or diencephalon. The thalamus, hypothalamus, and pineal glands make up the major regions of the diencephalon.

- The *thalamus* consists of a pair of oval masses of gray matter inferior to the lateral ventricles and surrounding the third ventricle. Sensory neurons entering the brain from the peripheral nervous system form relays with neurons in the thalamus that continue on to the cerebral cortex. In this way the thalamus acts

like the switchboard operator of the brain by routing sensory inputs to the correct regions of the cerebral cortex. The thalamus has an important role in learning by routing sensory information into processing and memory centers of the cerebrum.

- The *hypothalamus* is a region of the brain located inferior to the thalamus and superior to the pituitary gland. The hypothalamus acts as the brain's control center for body temperature, hunger, thirst, blood pressure, heart rate, and the production of hormones. In response to changes in the condition of the body detected by sensory receptors, the hypothalamus sends signals to glands, smooth muscles, and the heart to counteract these changes. For example, in response to increases in body temperature, the hypothalamus stimulates the secretion of sweat by sweat glands in the skin. The hypothalamus also sends signals to the cerebral cortex to produce the feelings of hunger and thirst when the body is lacking food or water. These signals stimulate the conscious mind to seek out food or water to correct this situation. The hypothalamus also directly controls the pituitary gland by producing hormones. Some of these hormones, such as oxytocin and antidiuretic hormone, are produced in the hypothalamus and stored in the posterior pituitary gland. Other hormones, such as releasing and inhibiting hormones, are secreted into the blood to stimulate or inhibit hormone production in the anterior pituitary gland.
- The *pineal gland* is a small gland located posterior to the thalamus in a sub-region called the epithalamus. The pineal gland produces the hormone melatonin. Light striking the retina of the eyes sends signals to inhibit the function of the pineal gland. In the dark, the pineal gland secretes melatonin, which has a sedative effect on the brain and helps to induce sleep. This function of the pineal gland helps to explain why darkness is sleep-inducing and light tends to disturb sleep. Babies produce large amounts of melatonin, allowing them to sleep as long as 16 hours per day. The pineal gland produces less melatonin as people age, resulting in difficulty sleeping during adulthood.

CEREBRUM

The largest region of the human brain, our cerebrum controls higher brain functions such as language, logic, reasoning, and creativity. The cerebrum surrounds the diencephalon and is located superior to the cerebellum and brainstem. A deep furrow known as the *longitudinal fissure* runs midsagittally down the center of the cerebrum, dividing the cerebrum into the left and right hemispheres. Each hemisphere can be further divided into 4 lobes: *frontal*, *parietal*, *temporal*, and *occipital*. The lobes are named for the skull bones that cover them. Frighteningly, these lobes are some of the areas of the brain attacked by Alzheimer's disease. If you want to find out your own genetic risk for late-onset Alzheimer's, learn more about DNA health testing and how you can discuss the results of this testing together with your healthcare provider.

The surface of the cerebrum is a convoluted layer of gray matter known as the *cerebral cortex*. Most of the processing of the cerebrum takes place within the cerebral cortex. The bulges of cortex are called *gyri* (singular: gyrus) while the indentations are called *sulci* (singular: sulcus).

Deep to the cerebral cortex is a layer of cerebral white matter. White matter contains the connections between the regions of the cerebrum as well as between the cerebrum and the rest of the body. A band of white matter called the corpus callosum connects the left and right hemispheres of the cerebrum and allows the hemispheres to communicate with each other.

Deep within the cerebral white matter are several regions of gray matter that make up the *basal nuclei* and the *limbic system*. The basal nuclei, including the globus pallidus, striatum, and subthalamic nucleus, work together with the substantia nigra of the midbrain to regulate and control muscle movements. Specifically, these regions help to control muscle tone, posture, and subconscious skeletal muscle. The limbic system is another group of deep gray matter regions, including the hippocampus and amygdala, which are involved in memory, survival, and emotions. The limbic system helps the body to react to emergency and highly emotional situations with fast, almost involuntary actions.

With so many vital functions under the control of a single incredible organ - and so many important functions carried out in its outer layers - how does our body protect the brain from damage? Our skull clearly offers quite a bit of protection, but what protects the brain from the skull itself? Read on!

MENINGES

Three layers of tissue, collectively known as the meninges, surround and protect the brain and spinal cord.

- The *dura mater* forms the leathery, outermost layer of the meninges. Dense irregular connective tissue made of tough collagen fibers gives the dura mater its strength. The dura mater forms a pocket around the brain and spinal cord to hold the cerebrospinal fluid and prevent mechanical damage to the soft nervous tissue. The name dura mater comes from the Latin for "tough mother," due to its protective nature.
- The *arachnoid mater* is found lining the inside of the dura mater. Much thinner and more delicate than the dura mater, it contains many thin fibers that connect the dura mater and pia mater. The name arachnoid mater comes from the Latin for "spider-like mother", as its fibers resemble a spider web. Beneath the arachnoid mater is a fluid-filled region known as the subarachnoid space.
- As the innermost of the meningeal layers, the *pia mater* rests directly on the surface of the brain and spinal cord. The pia mater's many blood vessels provide nutrients and oxygen to the nervous tissue of the brain. The pia mater also helps to regulate the flow of materials from the bloodstream and cerebrospinal fluid into nervous tissue.

CEREBROSPINAL FLUID

Cerebrospinal fluid (CSF) — a clear fluid that surrounds the brain and spinal cord — provides many important functions to the central nervous system. Rather than being firmly anchored to their surrounding bones, the brain and spinal cord float within the CSF. CSF fills the subarachnoid space and exerts pressure on the outside of the brain and spinal cord. The pressure of the CSF acts as a stabilizer and shock absorber for the brain and spinal cord as they float within the hollow spaces of the skull and vertebrae. Inside of the brain, small CSF-filled cavities called ventricles expand under the pressure of CSF to lift and inflate the soft brain tissue.

Cerebrospinal fluid is produced in the brain by capillaries lined with ependymal cells known as choroid plexuses. Blood plasma passing through the capillaries is filtered by the ependymal cells and released into the subarachnoid space as CSF. The CSF contains glucose, oxygen, and ions, which it helps to distribute

throughout the nervous tissue. CSF also transports waste products away from nervous tissues.

After circulating around the brain and spinal cord, CSF enters small structures known as arachnoid villi where it is reabsorbed into the bloodstream. Arachnoid villi are finger-like extensions of the arachnoid mater that pass through the dura mater and into the superior sagittal sinus. The superior sagittal sinus is a vein that runs through the longitudinal fissure of the brain and carries blood and cerebrospinal fluid from the brain back to the heart.

PHYSIOLOGY OF THE BRAIN

METABOLISM

Despite weighing only about 3 pounds, the brain consumes as much as 20% of the oxygen and glucose taken in by the body. Nervous tissue in the brain has a very high metabolic rate due to the sheer number of decisions and processes taking place within the brain at any given time. Large volumes of blood must be constantly delivered to the brain in order to maintain proper brain function. Any interruption in the delivery of blood to the brain leads very quickly to dizziness, disorientation, and eventually unconsciousness.

SENSORY

The brain receives information about the body's condition and surroundings from all of the sensory receptors in the body. All of this information is fed into sensory areas of the brain, which put this information together to create a perception of the body's internal and external conditions. Some of this sensory information is autonomic sensory information that tells the brain subconsciously about the condition of the body. Body temperature, heart rate, and blood pressure are all autonomic senses that the body receives. Other information is somatic sensory information that the brain is consciously aware of. Touch, sight, sound, and hearing are all examples of somatic senses.

MOTOR CONTROL

Our brain directly controls almost all movement in the body. A region of the cerebral cortex known as the motor area sends signals to the skeletal muscles to produce all voluntary movements. The basal nuclei of the cerebrum and gray matter in the brainstem help to control these movements subconsciously and prevent extraneous

motions that are undesired. The cerebellum helps with the timing and coordination of these movements during complex motions. Finally, smooth muscle tissue, cardiac muscle tissue, and glands are stimulated by motor outputs of the autonomic regions of the brain.

PROCESSING

Once sensory information has entered the brain, the association areas of the brain go to work processing and analyzing this information. Sensory information is combined, evaluated, and compared to prior experiences, providing the brain with an accurate picture of its conditions. The association areas also work to develop plans of action that are sent to the brain's motor regions in order to produce a change in the body through muscles or glands. Association areas also work to create our thoughts, plans, and personality.

LEARNING AND MEMORY

The brain needs to store many different types of information that it receives from the senses and that it develops through thinking in the association areas. Information in the brain is stored in a few different ways depending on its source and how long it is needed. Our brain maintains short-term memory to keep track of the tasks in which the brain is currently engaged. Short-term memory is believed to consist of a group of neurons that stimulate each other in a loop to keep data in the brain's memory. New information replaces the old information in short-term memory within a few seconds or minutes, unless the information gets moved to long-term memory.

Long-term memory is stored in the brain by the hippocampus. The hippocampus transfers information from short-term memory to memory-storage regions of the brain, particularly in the cerebral cortex of the temporal lobes. Memory related to motor skills (known as procedural memory) is stored by the cerebellum and basal nuclei.

HOMEOSTASIS

The brain acts as the body's control center by maintaining the homeostasis of many diverse functions such as breathing, heart rate, body temperature, and hunger. The brainstem and the hypothalamus are the brain structures most concerned with homeostasis.

In the brainstem, the medulla oblongata contains the cardiovascular center that monitors the levels of dissolved carbon dioxide and oxygen in the blood, along with blood pressure. The cardiovascular center adjusts the heart rate and blood vessel dilation to maintain healthy levels of dissolved gases in the blood and to maintain a healthy blood pressure. The medullary rhythmicity center of the medulla monitors oxygen and carbon dioxide levels in the blood and adjusts the rate of breathing to keep these levels in balance.

The hypothalamus controls the homeostasis of body temperature, blood pressure, sleep, thirst, and hunger. Many autonomic sensory receptors for temperature, pressure, and chemicals feed into the hypothalamus. The hypothalamus processes the sensory information that it receives and sends the output to autonomic effectors in the body such as sweat glands, the heart, and the kidneys.

SLEEP

While sleep may seem to be a time of rest for the brain, this organ is actually extremely active during sleep. The hypothalamus maintains the body's 24 hour biological clock, known as the circadian clock. When the circadian clock indicates that the time for sleep has arrived, it sends signals to the reticular activating system of the brainstem to reduce its stimulation of the cerebral cortex. Reduction in the stimulation of the cerebral cortex leads to a sense of sleepiness and eventually leads to sleep.

In a state of sleep, the brain stops maintaining consciousness, reduces some of its sensitivity to sensory input, relaxes skeletal muscles, and completes many administrative functions. These administrative functions include the consolidation and storage of memory, dreaming, and development of nervous tissue.

There are two main stages of sleep: rapid eye movement (REM) and non-rapid eye movement (NREM). During REM sleep, the body becomes paralyzed while the eyes move back and forth quickly. Dreaming is common during REM sleep and it is believed that some memories are stored during this phase. NREM sleep is a period of slow eye movement or no eye movement, culminating in a deep sleep of low brain electrical activity. Dreaming during NREM sleep is rare, but memories are still processed and stored during this time.

REFLEXES

A reflex is a fast, involuntary reaction to a form of internal or external stimulus. Many reflexes in the body are integrated in the brain, including the pupillary light reflex, coughing, and sneezing. Many reflexes protect the body from harm. For instance, coughing and sneezing clear the airways of the lungs. Other reflexes help the body respond to stimuli, such as adjusting the pupils to bright or dim light. All reflexes happen quickly by bypassing the control centres of the cerebral cortex and integrating in the lower regions of the brain such as the midbrain or limbic system.

Prepared by Tim Taylor, Anatomy and Physiology Instructor

HEMIPLEGIA

The most common cause of hemiplegia is a stroke. During a stroke (cerebrovascular accident), an area of tissue in the brain dies because of either an interrupted blood supply or increased brain swelling. The left brain controls the right arm and leg, so a stroke on one side of the brain may cause hemiplegia on the opposite side.

Hemiplegia can also temporarily result from migraine headaches, seizures, and many other conditions affecting the nerves. Unexplained new weakness on one side of the body should be considered an emergency and prompt immediate medical attention.

After a stroke, hemiplegia may be permanent. Hemiplegia may be very mild and almost unnoticeable, but get temporarily worse during periods of sleep deprivation, illness, or stress.

CAUSES:

Though the arms, legs, and possibly torso are the regions of the body most obviously affected by hemiplegia, in most cases of hemiplegia these body regions are actually perfectly healthy. Instead, the problem resides in the brain, which is unable to produce, send, or interpret signals due to disease or trauma-related damage. Less frequently, hemiplegia results from damage to one side of the spinal cord, but these sorts of injuries more typically produce global problems, not just paralysis on one side of the body.

Some common causes of hemiplegia include:

- Traumatic brain injuries to one side of the brain only. These may be caused by car accidents, falls, acts of violence, and other factors.
- Cardiovascular problems, particularly aneurysms and haemorrhages in the brain.
- Strokes and transient ischemic attacks (better known as TIA or mini-strokes).
- Infections, particularly encephalitis and meningitis. Some serious infections, particularly sepsis and abscesses in the neck, may spread to the brain if left untreated.
- Conditions that cause demyelination of the brain, including multiple sclerosis and some other autoimmune diseases.

- Reactions to surgery, medication, or anesthesia.
- Loss of oxygen to the brain due to choking or anaphylactic shock.
- Brain cancers.
- Lesions in the brain, even if non-cancerous, since these lesions can impede function on one side of the brain.
- Congenital abnormalities, including cerebral palsy and neonatal-onset multi-inflammatory disease.
- Rarely, psychological causes; some states of catatonia can cause hemiplegia, and people with parasomnia—a sleep disorder leading to unusual night time behavior—may experience night time episodes of hemiplegia.

MECHANISM:

Movement of the body is primarily controlled by the pyramidal (or corticospinal) tract, a pathway of neurons that begins in the motor areas of the brain, projects down through the internal capsule, continues through the brainstem, decussates (or cross midline) at the LOWER medulla, then travels down the spinal cord into the motor neurons that control each muscle. In addition to this main pathway, there are smaller contributing pathways (including the anterior corticospinal tract), some portions of which do not cross the midline.

Because of this anatomy, injuries to the pyramidal tract above the medulla generally cause contralateral hemiparesis (weakness on the opposite side as the injury). Injuries at the lower medulla, spinal cord, and peripheral nerves result in ipsilateral hemiparesis.

In a few cases, lesions above the medulla have resulted in ipsilateral hemiparesis:

- In several reported cases, patients with hemiparesis from an old *contralateral* brain injury subsequently experienced worsening of their hemiparesis when hit with a second stroke in the *ipsilateral* brain.[14][15][16] The authors hypothesize that brain reorganization after the initial injury led to more reliance on uncrossed motor pathways, and when these compensatory pathways were damaged by a second stroke, motor function worsened further.

- A case report describes a patient with a congenitally uncrossed pyramidal tract, who developed right-sided hemiparesis after a hemorrhage in the right brain

HEMIPLEGIA SIGN:

Hemiplegia caused by a lesion of the pyramidal tract. This is the main neural pathway that carries the motor orders. It is therefore a set of neurons involved in voluntary movement.

The pyramidal pathway begins in the brain at an area of nerve cells of pyramidal shape and joined with other nerve cells of the spinal cord. Pyramidal tract neurons then transmit their orders to l mn which carry them to the muscles. Before reaching the spinal cord, brain stem, the pyramidal tract changes sides. This explains that a lesion is localized on the side opposite the affected limb: left brain injury causes a right hemiplegia and vice versa.

Observed with different depending on the location of the injury.

- When the lesion in the brain cortex, this causes a disproportionate hemiplegia: the face and arms are predominantly affected.
- When the lesion is located in the white matter of the brain, this causes a proportional hemiplegia: arm and leg are affected similarly deficient.
- A brainstem lesion, it causes a paralysis of one side of the body and involvement of the face on the other side.

HEMIPLEGIA SYMPTOMS

In some cases the lesions, arm and leg are affected, in others only the arm or only the face.

When hemiplegia is partial and that movements are still possible, there is a decrease in muscle strength and mobility impaired, as manifested by clumsiness, trouble walking accompanied by a great tiredness and falls of one side.

When hemiplegia is total, even lesreflexes are abolished. However, the babinski sign is present: when you touch the outside of the foot, it causes an extension of the big toe. In a healthy person, this stimulation leads to a bending of the big toe.
Hemiplegia is accompanied by changes in muscle tone: the muscles are stiff and overly contracted any (spastic hemiplegia) or conversely soft and flabby (flaccid hemiplegia).

On the face, the damage to the muscles can result in a drooping eyelid or an asymmetric smile.

HEMIPLEGIA OTHER SYMPTOMS

In addition to motor disturbances, hemiplegia is characterized by the appearance of other symptoms.

- Pain. There is pain associated with brain injury and localized pain in the affected limbs.
- Aphasia. People, who suffer from hemiplegia, even though the process of thinking and developing ideas is held, are struggling to find words and articulate. In addition, they may have difficulty understanding the meaning of words they hear or read them.
- Disorders of the sphincters. A quarter of people with hemiplegia have sphincter disturbances resulting in either urinary incontinence or urinary retention, fecal incontinence is still.
- Sexual dysfunction: erection, ejaculation is compromised in many men with hemiplegia. Moreover, a decreased libido, especially at the beginning of the disability, is often found.

INVESTIGATION

Routine investigations:

BLOOD

TC

DC

ESR

HB

BIOCHEMISTRY

SUGAR: F/ PP/ R

Cholesterol

KIDNEY FUNCTION TEST

UREA

CREATININE

URIC ACID

LIVER FUNCTION TEST

Bilirubin total Direct /indirect

SGOT

SGPT

ALKALINE PHOSPHATASE

PROTINE TOTAL ALB/GLO

URINE ROUTINE TEST

Albumin

Sugar

Deposit

NON-ROUTINE INVESTIGATIONS:

Electrolytes

Thyroid function

Chest X-Ray

Cranial CT/MRI

Cardiac ultrasound

Echocardiography

ECG

EEG

Antithrombin

Temporal artery biopsy

Blood culture

Cardiac culture

EXAMINATION OF CENTRAL NERVOUS SYSTEM:

HIGHER FUNCTIONS:

Higher brain function such as thought and actions are examined

Conscious level

Sleep rhythm

Handedness

Speech

Memory

Intelligence

ORIENTATION :

In orientation a person's basic attitude, beliefs, or feelings in relation to a particular subject or issue are examined.

Ex.

Place

Time

Person

EXAMINATION OF CRANIAL NERVES:

There is 12 pair of cranial nerves in the body. Cranial nerve examination is used to examine the functionality of the cranial nerves. This is a highly formalized series of tests that assess the status of each nerve.

- Olfactory nerve
- Optic nerve
- Occulomotor nerve
- Trochlear nerve
- Trigeminal nerve
- Abducent nerve
- Facial nerve
- Vestibule cochlear nerve
- Glosso pharyngeal nerve
- Vagus nerve
- Accessory nerve
- Hypoglossal nerve

EXAMINATION OF MOTOR SYSTEM

NUTRITION:

Nutrition of the patient is examined for ascessing if any atrophy of muscles present

- Shoulder girdle
- Upper limp
- Hip girdle
- Lower limp

TONE:

Muscle tone is the continuous partial contraction in a muscle. Muscle tone determines how well the muscle works when the brain signals the body to hold a position or perform a movement. For example, it affects sitting, standing, reaching and walking.

Strength and muscle tone are not the same thing, but they are related. Normal muscle tone makes it easier to strengthen muscles.

The type of muscle tone a person has is present at birth.

Good (average) muscle tone allows muscles and joints to move easily.

"Low" muscle tone, or hypotonia, means that the muscle is soft and flabby. It makes movement difficult because the muscle is not held together well.

"High" muscle tone, or hypertonia, means that the muscle is stiff, so it is difficult to relax the muscle and move the joint freely.

POWER:

Power of the muscle is examined by using grade

Grading of muscle power:

Grade 0- complete paralysis.

Grade 1 -flicker of contraction present.

Grade 2- active movement with gravity eliminated.

Grade 3-Active movement against gravity.

Grade 4-Active movement against gravity and some resistance

Grade 5-Active movement against gravity and fulle resistance

EXAMINATION OF SENSORY SYSTEM:

The following sensory functions are examined

Touch

Pain

Temperature

Position sence

Vibration sence

Joint sence

CORTICAL SENSES:

Tactile localisation

2 point discrimination

Stereognosis

Graphesthesia

Sensory inattention

REFLEXES

A reflex is an involuntary and nearly instantaneous movement in response to a stimulus. A reflex is made possible by neural pathways called reflex arcs which can act on an impulse before that impulse reaches the brain. The reflex is then an automatic response to a stimulus that does not receive or need conscious thought. It is used to differentiate the upper motor lesion from the lower motor lesion.

Superficial reflexes:

Corneal

Conjuctival

Abdominal

Cremasteric

Plantar

Deep tendon reflexes:

Biceps

Triceps

Supinator

Knee

Ankle

Grading of the reflexes:

Grade 0: Absence

Grade 1: Diminished

Grade 2: Normal

Grade 3: Exaggerated

Grade 4: Clonus

CEREBRAL COORDINATION:

The cerebellum is the part of the brain most involved in coordinating sequences of movements. It also controls balance and posture. Anything that damages the cerebellum can lead to loss of coordination. The following test are used to assess the cerebral co ordination function is affected / normal.

Upper limb:

Finger nose test

Finger to finger nose test

Tapping in a circle test

Disdokokinesia

Pest pointing test

Rigid hand tapping

Spiral drawing

Dysmetria

Rebound phenomenon

Lower limb:

Heel knee test

Drawing a circle in air

Walking in straight line

Foot pat test

INVOLENTORY MOVEMENTS

The following involuntary movements of the body are examined to asses the involvement of cerebellum.

Epilepsy

Choreas & dystonias

Inv.movements of face and neck

Tremors

Movements limited to the muscles

GAIT:

A person's manner of walking is examined

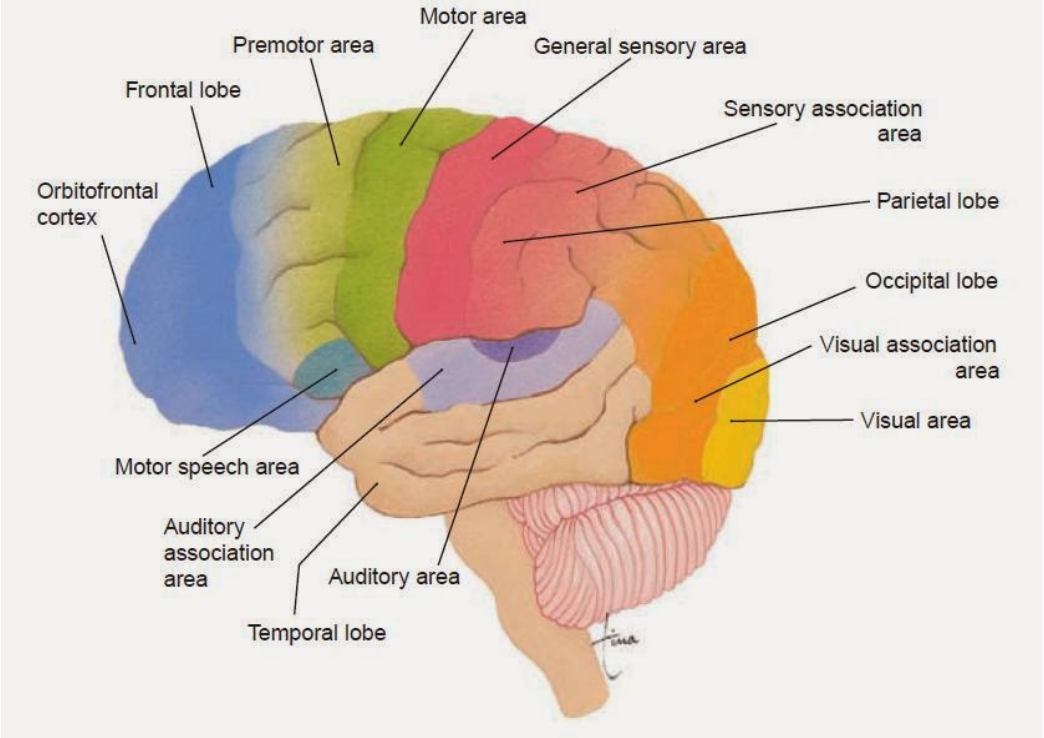
HEMIPLEGIA COMPLICATION

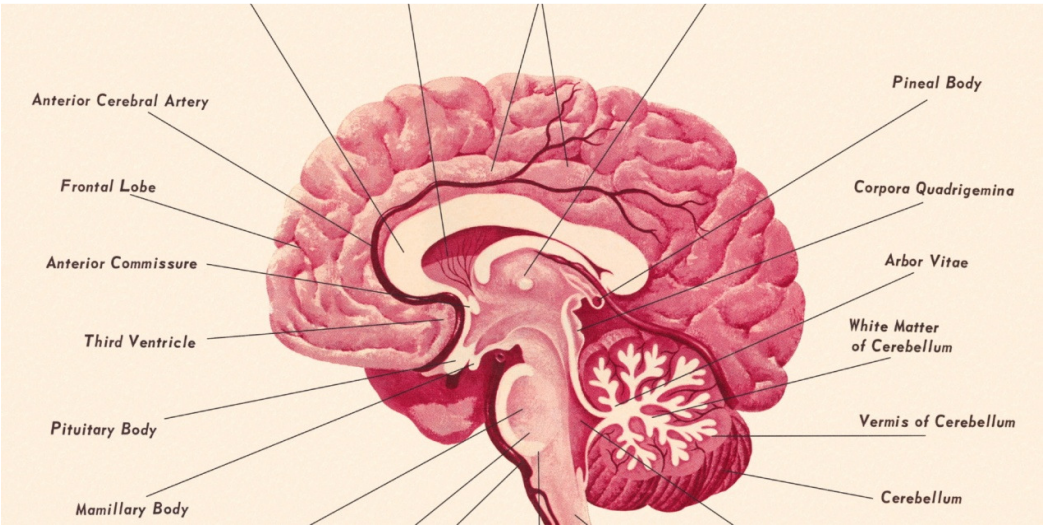
The immobility of paralysis arising member is responsible for complications that specialists in physical medicine and rehabilitation at trying to prevent the initial management.

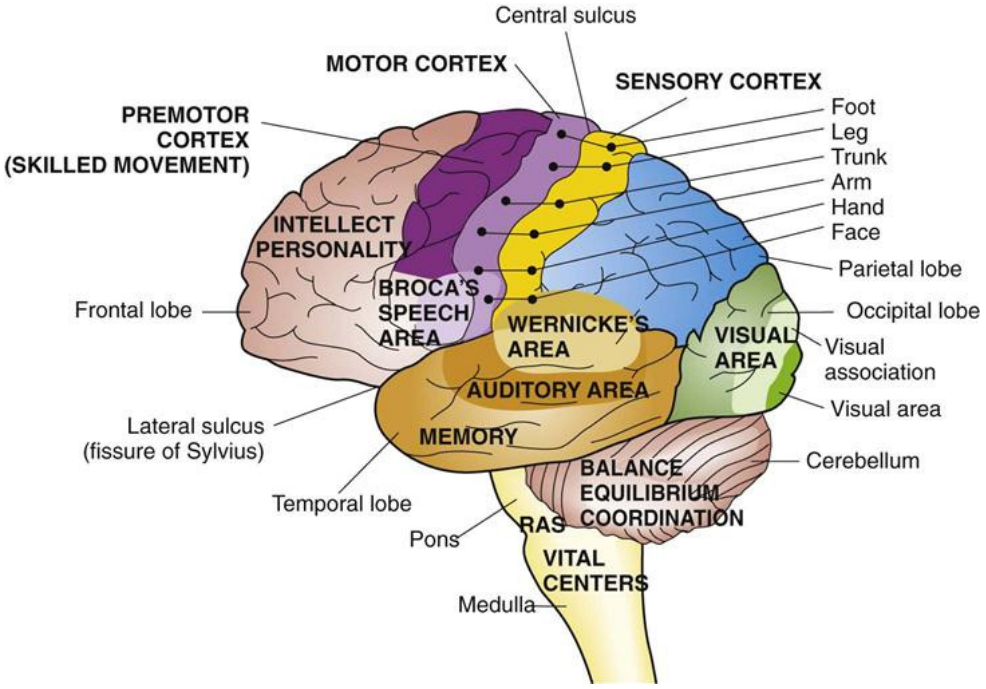
The main complication remains on the loss of autonomy: everything must be done to try to recover mobility as complete as possible.

Among the complications that can occur after hemiplegia

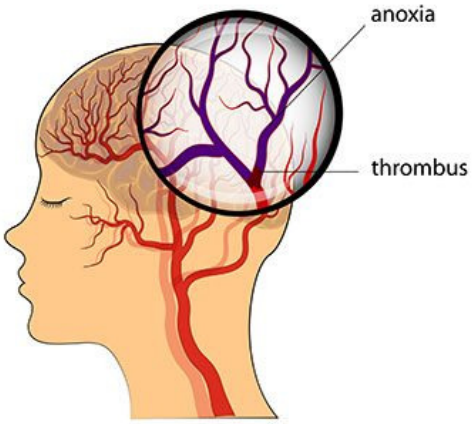
- Pain in joints of immobilized different: the shoulder is often affected with a stiffening of the muscles (spasticity) and local inflammation.
- Moreover, the bones of people with hemiplegia are weakened and lose bone density (osteopenia) as the brain give rise to abnormal vascularisation of bone.
- Finally, sitting in a wheelchair or bedridden status may promote pressure sores (skin necrosis at the points of support) and problems such as venous disorders of venous circulation, the risk of phlebitis and oedema.The sphincter disturbances can cause infectious complications.


Motor area
Premotor area
General sensory area
Frontal lobe
Sensory association area
Orbitofrontal cortex
Parietal lobe
Occipital lobe
Visual association area
Visual area
Motor speech area
Auditory association area
Auditory area
Temporal lobe

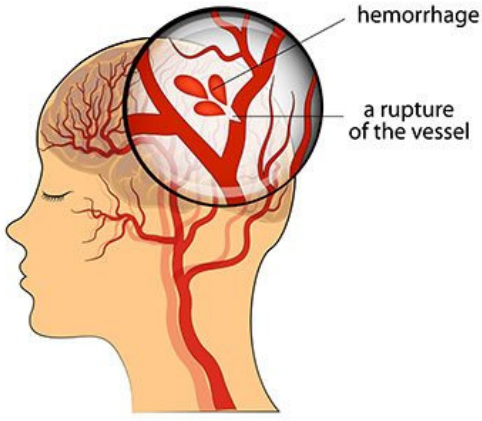

Anterior Cerebral Artery
Pineal Body
Frontal Lobe
Corpora Quadrigemina
Anterior Commissure
Arbor Vitae
Third Ventricle
White Matter of Cerebellum
Pituitary Body
Vermis of Cerebellum
Mamillary Body
Cerebellum



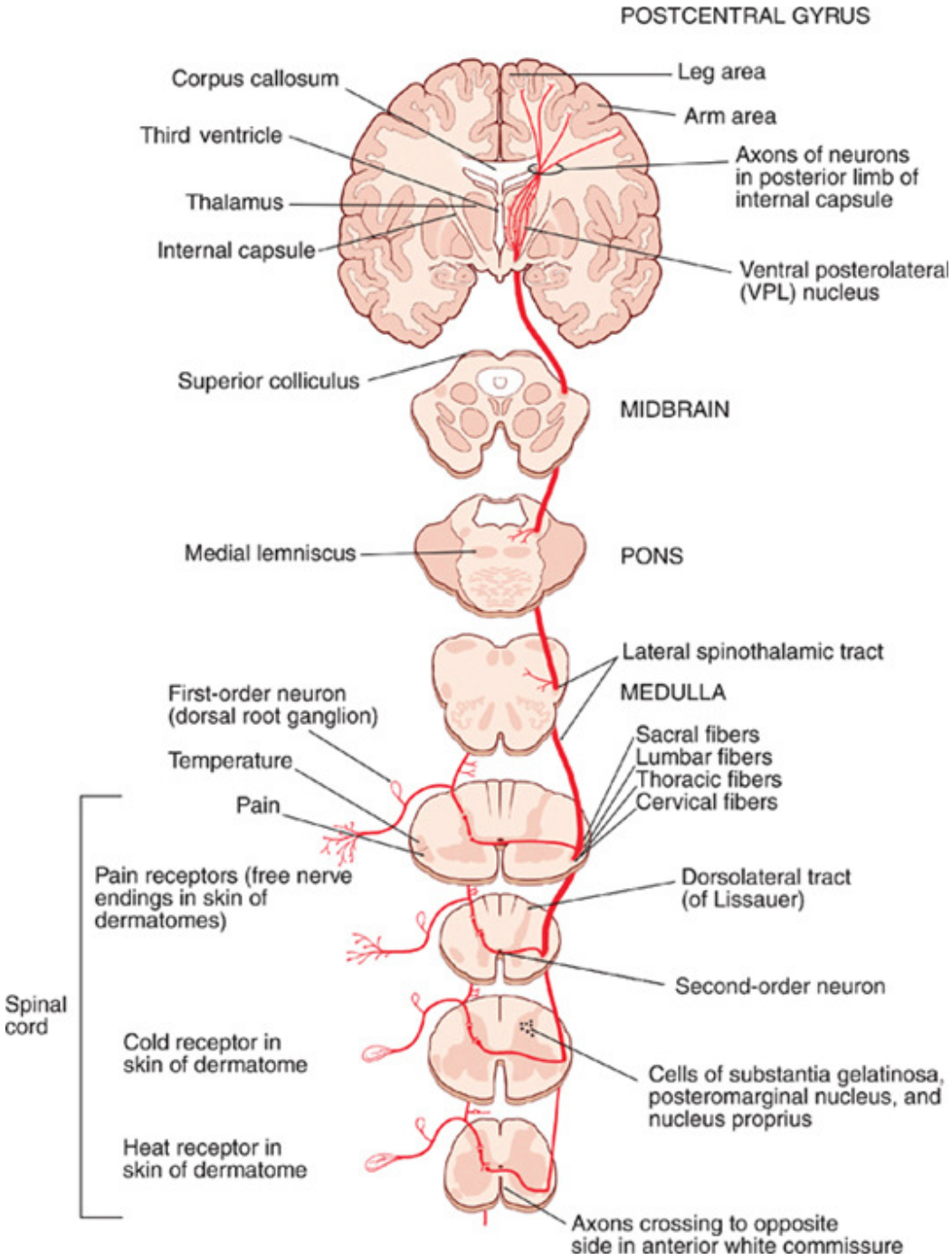
ISCHEMIC AND HEMORRHAGIC STROKE

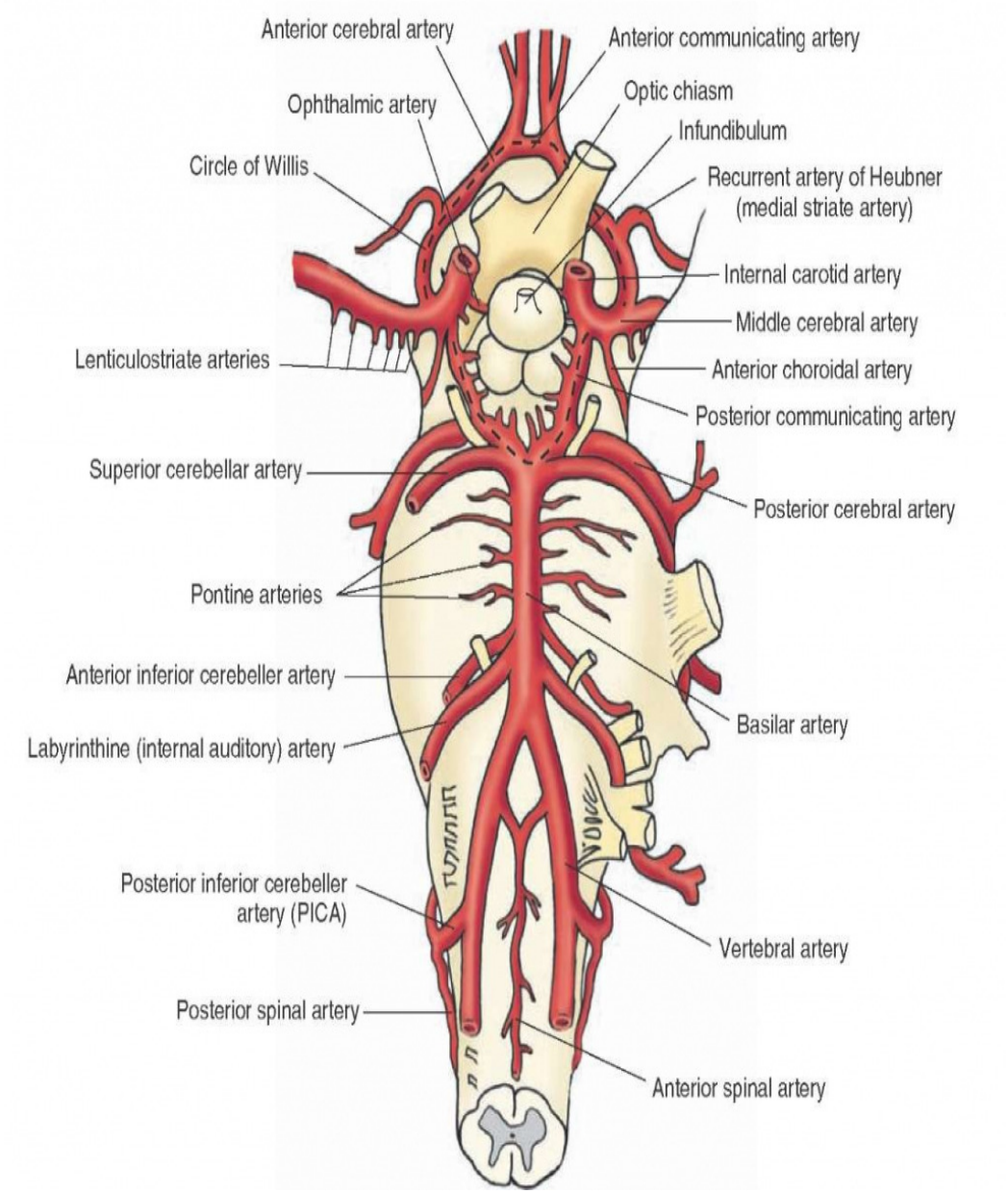


ISCHEMIC STROKE

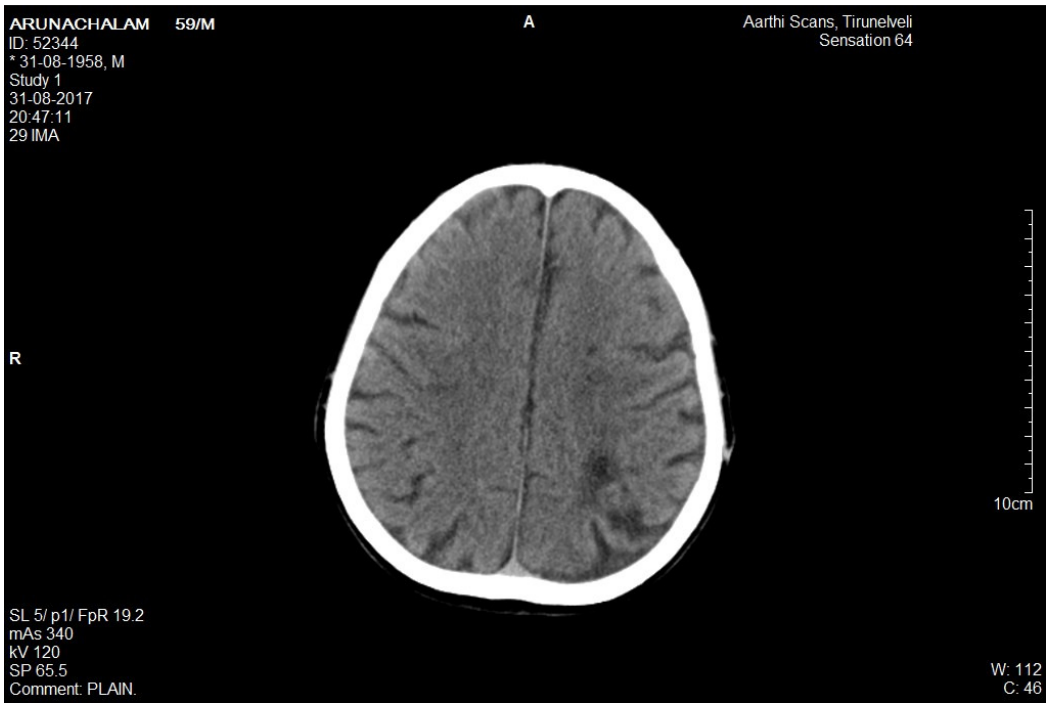


HEMORRHAGIC STROKE


POSTCENTRAL GYRUS
Corpus callosum
Leg area
Arm area
Third ventricle
Axons of neurons in posterior limb of internal capsule
Thalamus
Internal capsule
Ventral posterolateral (VPL) nucleus
Superior colliculus
MIDBRAIN
Medial lemniscus
PONS
Lateral spinothalamic tract
MEDULLA
First-order neuron (dorsal root ganglion)
Sacral fibers
Lumbar fibers
Thoracic fibers
Cervical fibers
Temperature
Pain
Pain receptors (free nerve endings in skin of dermatomes)
Dorsolateral tract (of Lissauer)
Second-order neuron
Spinal cord
Cold receptor in skin of dermatome
Cells of substantia gelatinosa, posteromarginal nucleus, and nucleus proprius
Heat receptor in skin of dermatome
Axons crossing to opposite side in anterior white commissure


Anterior cerebral artery
Anterior communicating artery
Ophthalmic artery
Optic chiasm
Infundibulum
Circle of Willis
Recurrent artery of Heubner (medial striate artery)
Internal carotid artery
Middle cerebral artery
Lenticulostriate arteries
Anterior choroidal artery
Posterior communicating artery
Superior cerebellar artery
Posterior cerebral artery
Pontine arteries
Anterior inferior cerebeller artery
Basilar artery
Labyrinthine (internal auditory) artery
Posterior inferior cerebeller artery (PICA)
Vertebral artery
Posterior spinal artery
Anterior spinal artery

CT- BRAIN


ARUNACHALAM 59/M
ID: 52344
* 31-08-1958, M
Study 1
31-08-2017
20:47:11
29 IMA
A
Aarthi Scans, Tirunelveli
Sensation 64
R
10cm
SL 5/ p1/ FpR 19.2
mAs 340
kV 120
SP 65.5
Comment: PLAIN.
W: 112
C: 46

MATERIALS AND METHODS

The clinical study on pakkavatham was carried out in the post graduate sirappu maruthuvam department of Government siddha medical college and Palayamkottai In this study 38 patients (who are selected by inclusion and exclusion criteria) were treated as OP and IP patients.

Selection of the patients:

All cases were carefully and thoroughly examined at the time of admission. Beside an individual case sheet was maintained for each patient in the in-patient ward. All patients were advised to come to the outpatient ward for further follow up. During admission the patients were subjected to careful history taking

INCLUSION CRITERIA:

- Age: between 20 – 65 years
- Sex: Both male and female
- Willing for admission and study in IPD for 40 Days or willing to attend OPD
- Inability/difficulty to use upper and lower limb of one side
- Willing to sign in the informed consent form.

EXCLUSION CRITERIA:

- Age: below 15 and above 65
- Pregnant and lactating women
- Known hypersensitivity or allergy to drug ingredients
- Renal failure
- Cirrhosis of liver
- Cardiac diseases

Diagnosis of the cases:

Diagnosis was made by conducting all the nessary investigations in siddha and by through clinical examination and laboratory findings as per modern medicine methodology.

In siddha system the following aspect were taken into consideration

- Pori arithal
- Pulan arithal

- Vinathal
- Examination of uyir thathukkal
- Envagai thervugal
- Udal thathukkal
- Nilangal
- Neerkuri and neikuri

The following investigations were done in modern medicine methodology

Hematological Investigation:

- Total WBC
- Differential wbc count
- Erythrocyte sedimentation rate
- Haemoglobin percentage
- Blood sugar
- Blood urea
- Serum cholesterol
- Bleeding time
- Clotting time

Urine analysis:

- Albumin
- Sugar
- Deposit

Special investigations:

- X-Ray chest PA view
- Computerized tomography – brain(contrast)
- Computerized tomography – brain(plain)
- Magnetic resonance imaging
- Electro encephalo gram

Selection of drug:

The selected trail drug are

INTERNAL MEDICINE : VISHNU CHAKRA MATHIRAI

Ref : Siddha vaithiya thirattu

EXTERNAL MEDICINE: KODIVELI THYLAM

Ref : Gunapadam mooligai vaguppu

LINE OF TREATMENT:

The day before the internal medicine started, vellai ennai-15 ml wa given at early morning for purgation to correct the deranged vatham to all the patients

From the second day - the trail drug were administrated

VISHNU CHAKRA MATHIRAI as a internal medicine – 130 mg twice a day after food with thirikadugu choornam + inji juice + honey

KODIVELI THLAM as external medicine used for external application only

All the patients were adviced to maintain diatary regimen (or) pathiyam to avoid interaction with drug. Complimentary therapy like massage and varmam were manipulated.

TEST AND ASSESSMENT:

A.CLINICAL ASSESSMENT:

- Difficulty to use upper and lower limb of one side of the body
- Deviation of the mouth
- Drippling of saliva
- Difficulty in speech
- Difficulty to close the eyelids

B.ASSESMENT SCALE OF HEMIPLEGIA

- Examination of cranial nerves
- Examination of spino motor system
- Nutrion
- Tone
- Power

Grade 0- complete paralysis.

Grade 1 -flicker of contraction present.

Grade 2- active movement with gravity eliminated.

Grade 3-Active movement against gravity.

Grade 4-Active movement against gravity and some resistance

Grade 5-Active movement against gravity and fulle resistance

- Coordination
- Involuntary movements
- Gait
- Reflexes:

  Extensor plantar response

  Superficial reflexes

  Deep tendon reflexes

    Grade 0: Absence

    Grade 1: Diminished

    Grade 2: Normal

    Grade 3: Exaggerated

    Grade 4: Clonus

RESULTS AND OBSERVATION

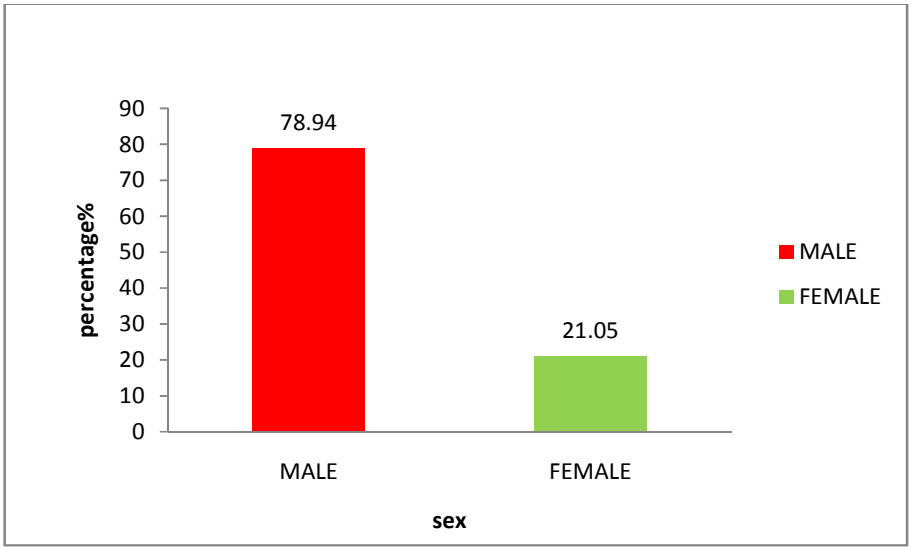
For the clinical study 40 patients were selected and treated in PG-III Sirappu Maruthuvam Department, Government Siddha Medical College and Hospital, Palayamkottai. Results were observed with respect to the following criteria.

1. Sex distribution
2. Age distribution
3. Occupation
4. Socio-economic status
5. Gunam
6. Diet
7. Pathological history
8. Mukkutra Kaalam
9. Thinai and land incidence
10. Paruva kaalam
11. Affected side
12. Interest to siddha treatment after stroke
13. Duration of illness In patients
14. Duration of illness Out patients
15. Precipitating factor
16. Clinical presentation
17. Disturbance in vadha
18. Disturbance in pitha
19. Disturbance in kabha
20. Udal Thathukkal
21. Patients treated only with trial drugs
22. Patients treated only trial drugs along with Massage therapy
23. Patients treated only trial drugs with along with varmam
24. Patients treated with trial drugs with varmam and massage therapy
25. Comparison between effective of trial drug and trial drug with complementary therapies

1. INCIDENCE OF PAKKAVATHAM (INPATIENTS AND OUT PATIENTS)

Among the thirty eight patients of varied etiology who were treated for study in the inpatient and outpatient ward the incidence is 30 patients in Males, 78.94% and 8 patients in female , 21.05%

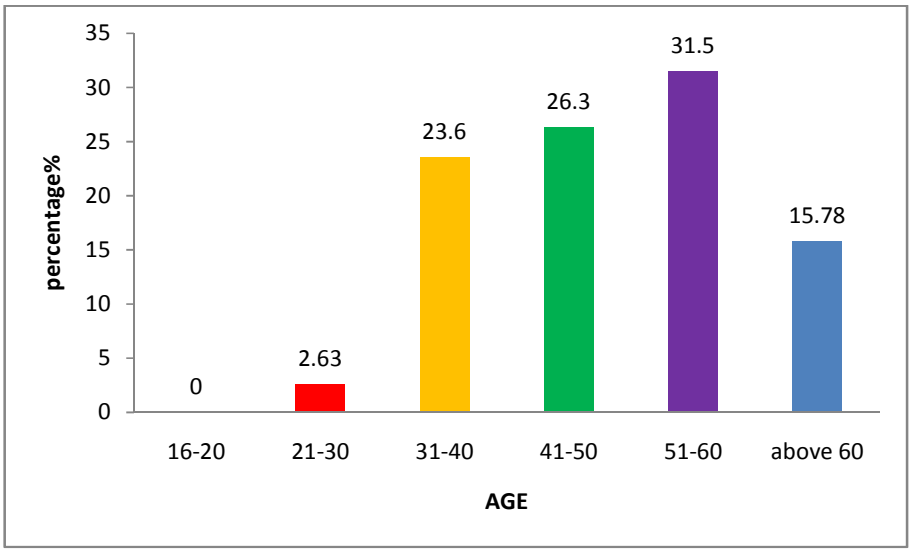
S.no	Sex	No. of patients in IN and OUT patients ward	Percentage(%)
1	Male	30	78.94
2	Female	8	21.05



2. AGE INCIDENCE

Among the thirty four patients the highest incidence was in the age group of 51 – 60 years (31.5%), 1 patient belonged to the age group of 30 years , 2.63% 9patients belong to Age group of 31 – 40, 26.3%, 6 patients to the age group of 60 and above, 15.78%

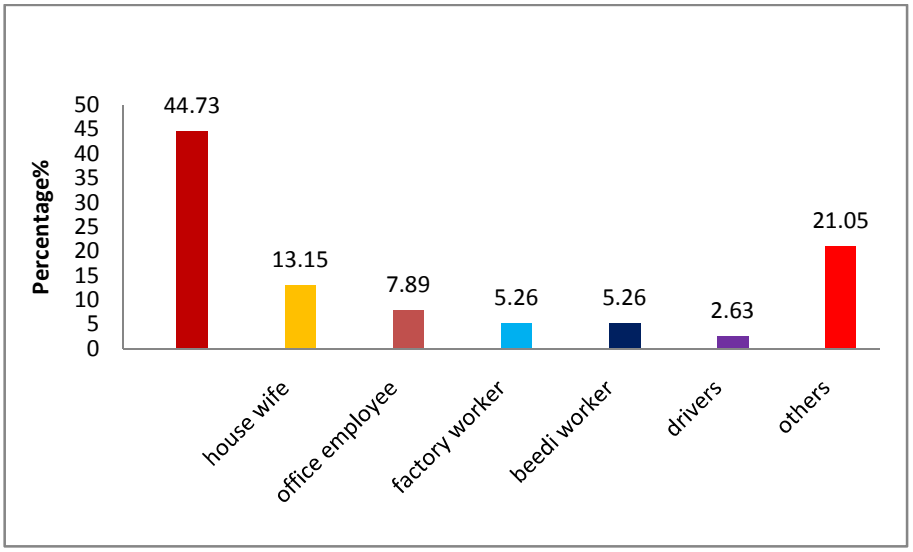
S.no	Age	No. of patients	Percentage(%)
1	16 – 20	0	0
2	21 – 30	1	2.63
3	31 – 40	9	23.6
4	41 – 50	10	26.3
5	51 – 60	12	31.5
6	Above 60	6	15.78



3. OCCUPATION

Among 38 Patients ,17patients were agricultural labour 44.73%,5 patients were house wife 13.15%,3 patients were office employee 7.89%, 2 patients were factory workers and beedi workers 5.26%,1 patient was driver and rest were others.]

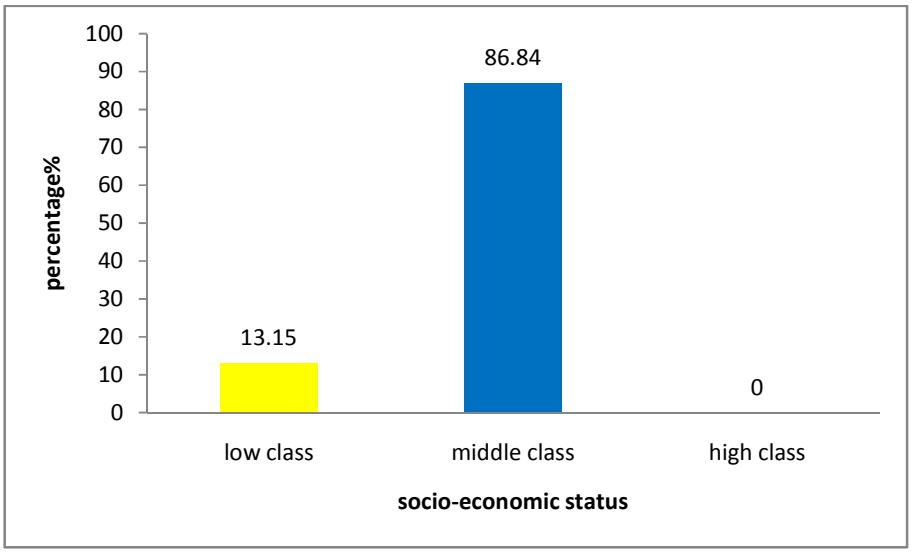
S.no	Occupation	No. of patients	Percentage(%)
1	Agricultural labours	17	44.73
2	House wife	5	13.15
3	Office employee	3	7.89
4	Factory worker	2	5.26
5	Beedi worker	2	5.26
6	Un employee	0	0
7	Drivers	1	2.63
8	Others	8	21.05



4. SOCIO ECONOMICAL STATUS

Among 38 patients, 33 patients were belong to middle class 86.84%and 5 patients belong to low class 13.15%.

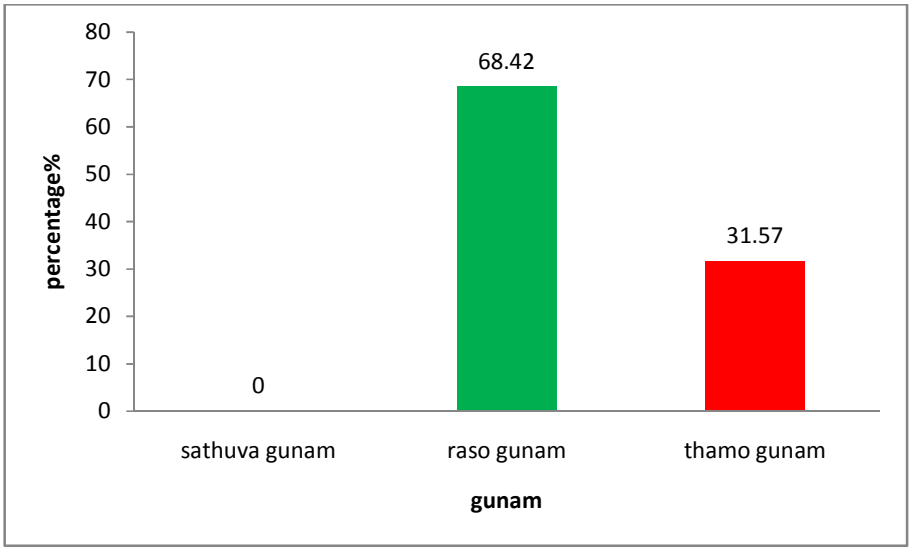
S.no	Socio - Economical status	No. of patients	Percentage(%)
1	Low class	5	13.15
2	Middle class	33	86.84
3	High class	0	0



5. REFERENCE TO GUNAM

Among 38 patients, 26 patients were raso gunam 68.42% and 12 patients belong to thamo gunam 31.57%

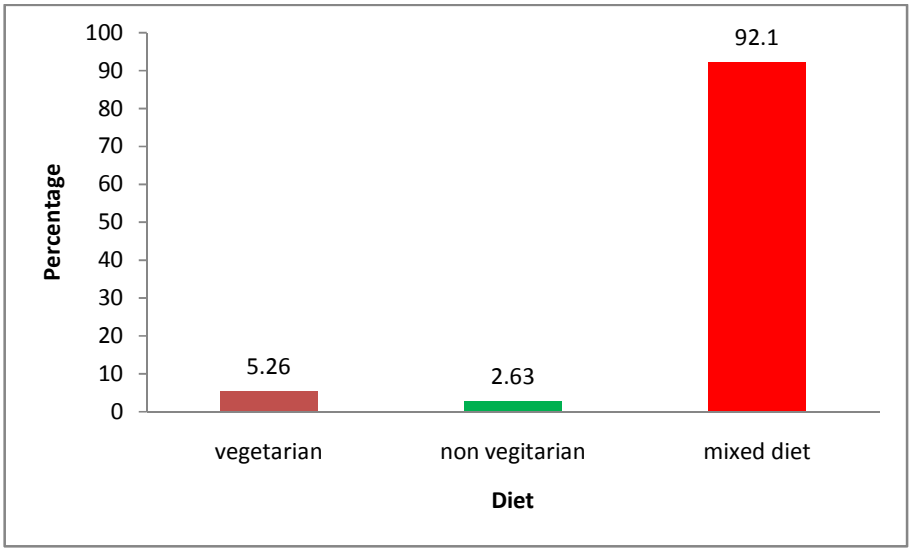
S.no	Gunam	No. Of patients	Percentage(%)
1	Sathuva gunam	0	0
2	Raso gunam	26	68.42
3	Thamo gunam	12	31.57



6. REFERENCE TO DIET

Among 38 patients , 35 patients were belong to mixed diet 92.10%, 2 patient vegetarian diet 5.26% and 1 patient Non vegetarian diet 2.63%

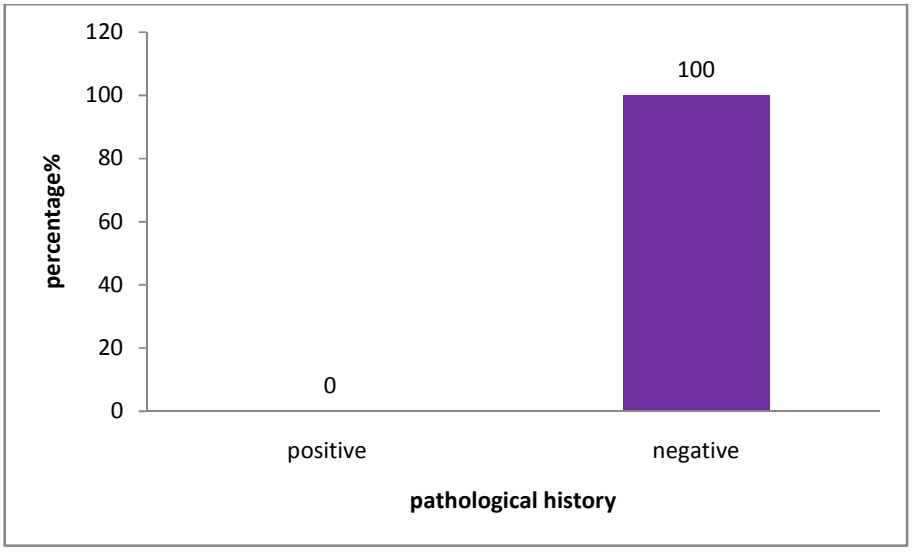
S.no	Diet	No. Of patients	Percentage(%)
1	Vegetarian diet	2	5.26
2	Non vegetarian diet	1	2.63
3	Mixed diet	35	92.10



7. PATHOLOGICAL HISTORY REFERENCE

Among 38 patients all have negative pathological history

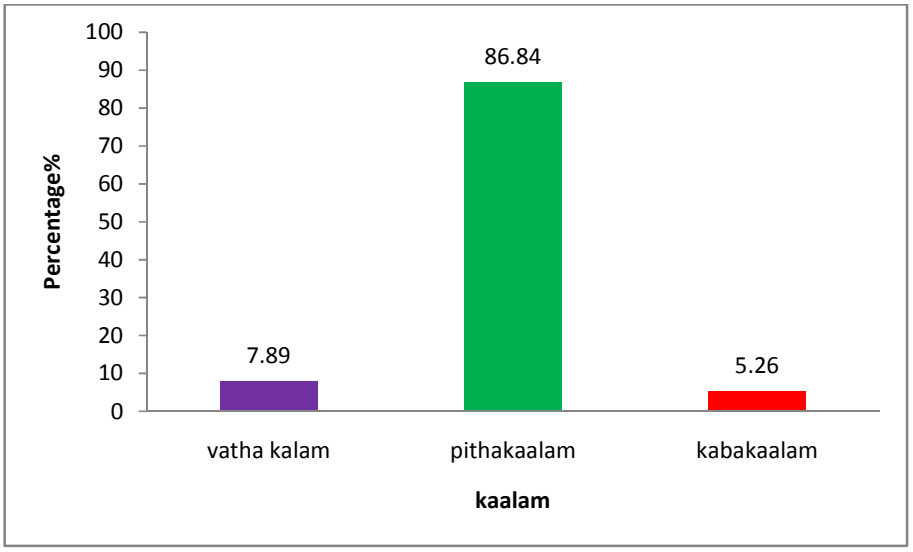
S.no	Pathological history	No. Of patients	Percentage(%)
1	Positive	0	0
2	Negative	38	100



8. DISTRIBUTION ACCORDING TO MUKKUTRA KAALAM

Among 38 patients 33 patients belong to pitha kalam 86.84%, 3 patients belongs to vatha kalam 7.89% and 2 patients belongs to Kaba kalam 5.26%

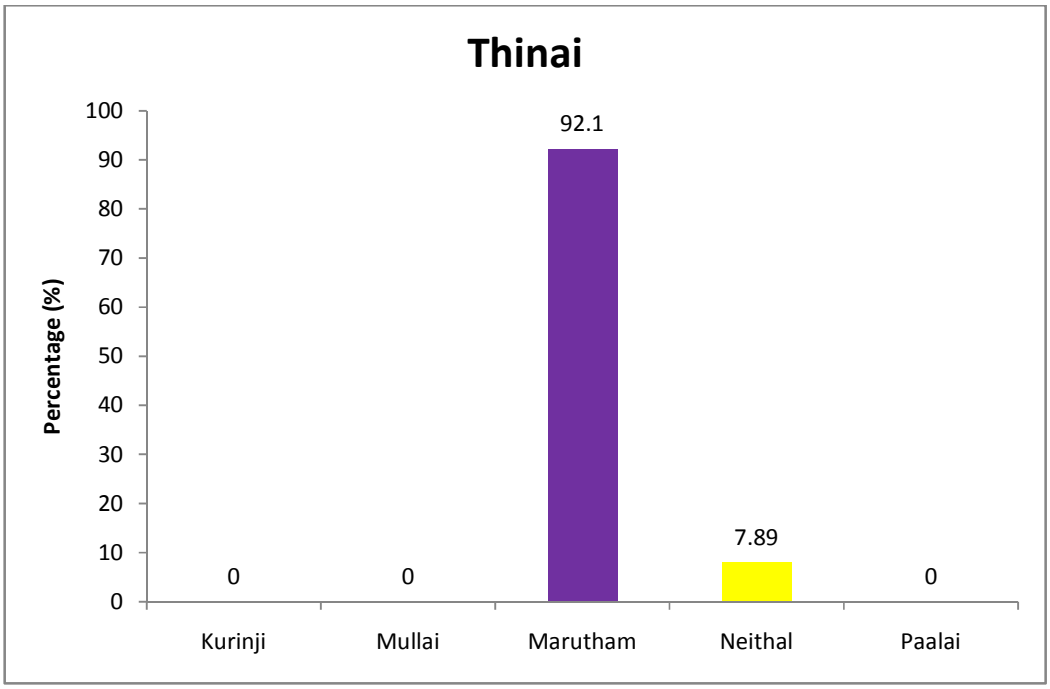
S.no	Kaalam	No. Of patients	Percentage(%)
1	Vatha kaalam(1-33yrs)	3	7.89
2	Pitha kaalam(34-66yrs)	33	86.84
3	Kaba kaalam(67-100yrs)	2	5.26



9. THINAI OR LAND INCIDENCE

Among 38 patients 33 belongs to marutham thinai 92.10 % and 3 patient belongs to neithal thinai 7.89%

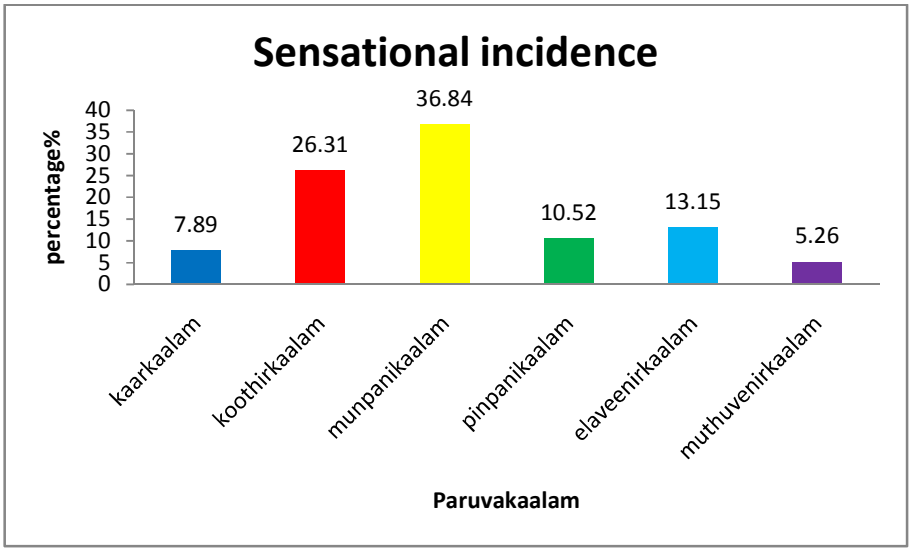
S.no	Thinai or Land	No. of patients	Percentage(%)
1	Kurinji	0	0
2	Mullai	0	0
3	Marutham	33	92.10
4	Neithal	5	7.89
5	Paalai	0	0



10. SENSATIONAL(PARUVAKALAM) INCIDENCE

Among 38 patients 14 patients belongs to munpani kalam, 36.84%, 10 patients belongs to koothirkaalam 26.31%, 5 patients belongs to elavenil kalam 13.15 %, 4 patients belongs to pinpani kalam 10.52%, 3 patients belongs to Kaar kalam. 7.89%, 2 patients belongs to muthuvenirkaalam 5.26%.

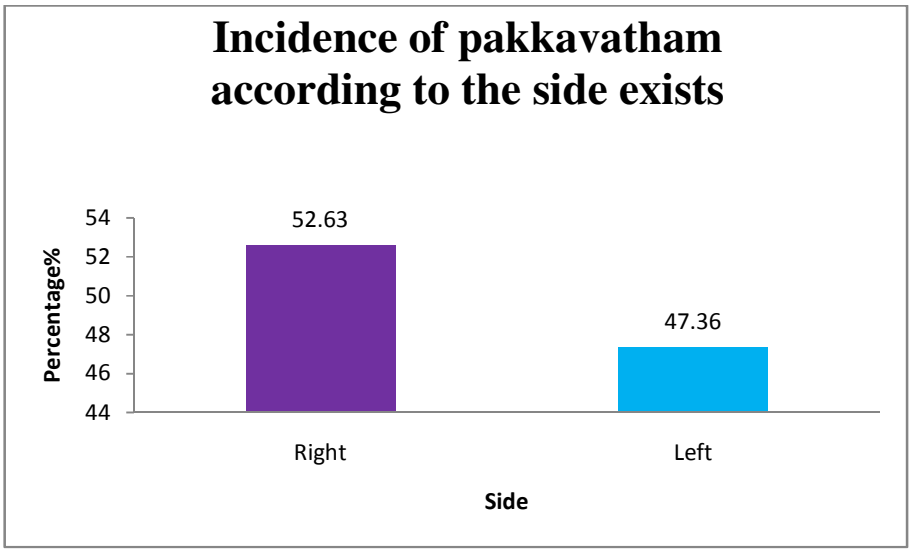
S.no	Paruvakalam	Month	No. Of patients	Percentage(%)
1	Kaarkalam	Avani-puratasi (15 aug – 14 oct)	3	7.89
2	Koothirkaalam	Ippasi-karthigai (15 oct – 14 dec)	10	26.31
3	Munpanikaalam	Margazhi-thai (15 dec – 14 feb)	14	36.84
4	Pinpanikaalam	Maasi-panguni (15 feb – 14 apr)	4	10.52
5	Elaveenirkaalam	Chitthirai-vaigasi (15 april– 14 jun)	5	13.15
6	muthuvenirkaalam	Aani-aadi (15 jun– 14 aug)	2	5.26



11. INCIDENCE OF PAKKAVATHAM ACCORDING TO THE SIDE EXISTS

Among 38 patients 20 patients were affected right side 52.63% and 18 patients were affected left side 47.36%.

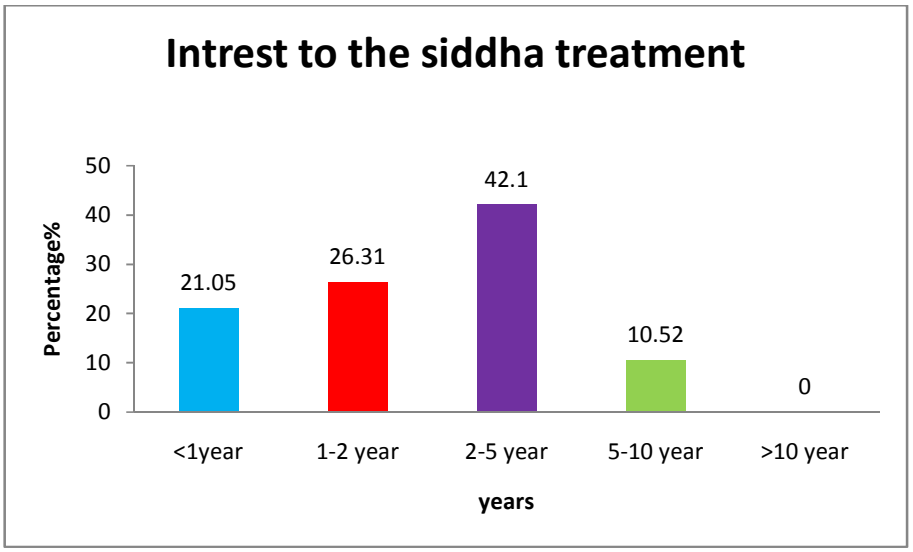
S.no	Affected side	No. of patients	Percentage(%)
1	Right	20	52.63
2	Left	18	47.36



12. INTEREST TO THE SIDDHA TREATMENT AFTER STROKE

Among 38 patients 8 patients were interested in siddha treatment below 1 year 21.05%, 10 patients were interested about 1 – 2 years 26.31%, 16 patients were interested about 2 – 5 years 42.10%, and 4 patients were interested about 5-10 years 10.52%.

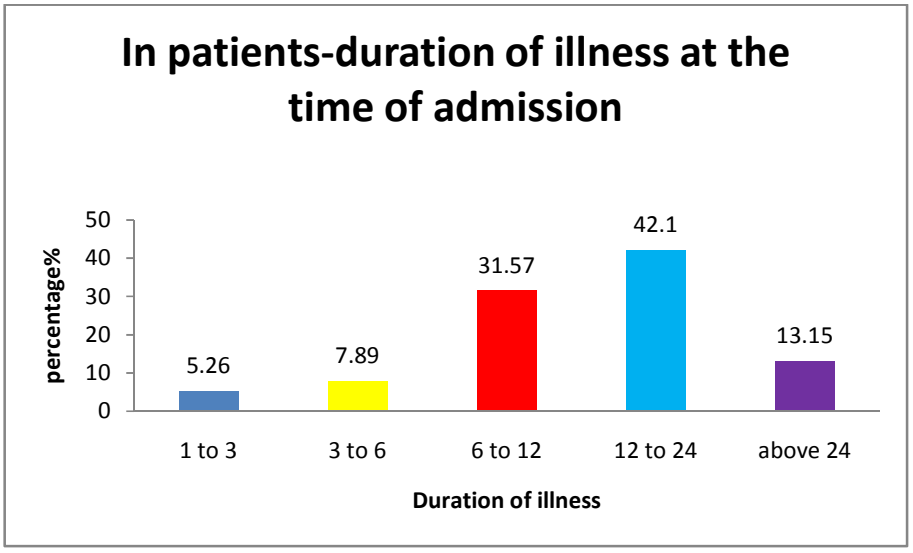
S.No	Affected side	No. of patients	Percentage(%)
1	Below 1 year	8	21.05
2	1 – 2 years	10	26.31
3	2 – 5 years	16	42.10
4	5 – 10 years	4	10.52
5	Above 10 years	0	0



13. DURATION OF ILLNESS AT THE TIME OF ADMISSION IN PATIENTS

At a time of admission among the 25 patients in the Inpatient ward All the 25 patients had been suffered below 2 years.

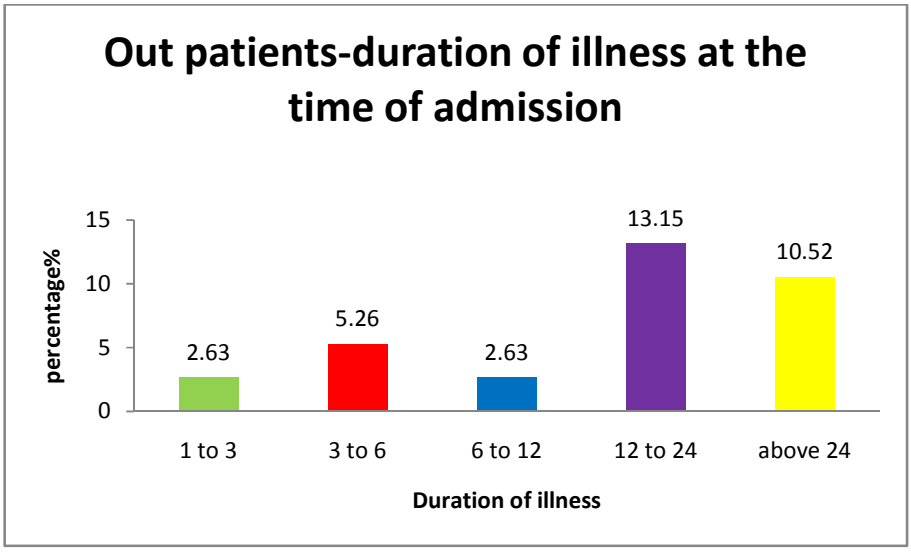
S.no	Duration of illness (in months)	No. Of patients	Percentage(%)
1	1 – 3	2	5.26
2	3 – 6	3	7.89
3	6 – 12	7	18.42
4	12 – 24	8	21.05
5	Above 24 months	5	13.15



OUT PATIENTS

Among 13 patients of the outpatient ward 4 patients suffered below 1 year and four patients suffered above 2 years and 5 patients between 12 and 24 months.

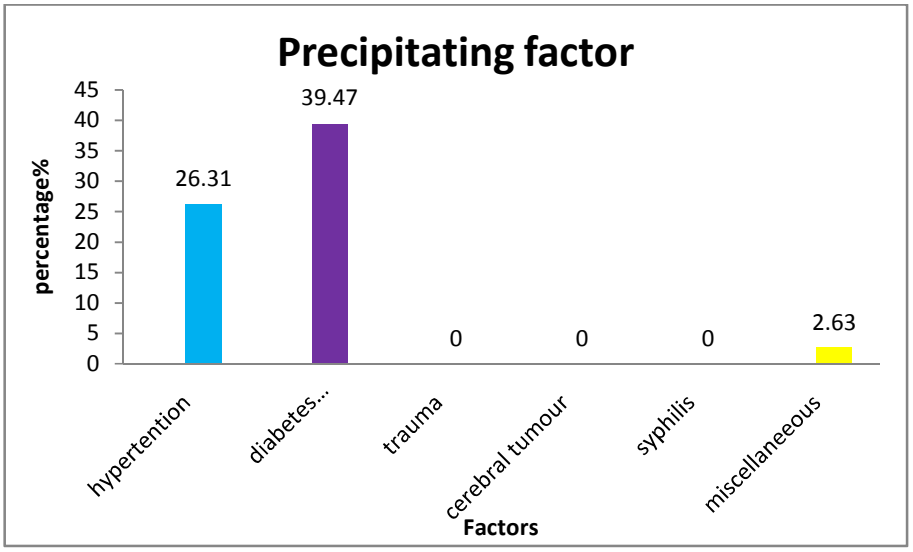
S.no	Duration of illness (in months)	No. of patients	Percentage(%)
1	1 – 3	1	2.63
2	3 – 6	2	5.26
3	6 – 12	1	2.63
4	12 – 24	5	13.15
5	Above 24 months	4	10.52



14. PRECIPITATING FACTOR

Among 38 patients Hypertension was precipitating factor in 10 patients 26.31%, 15 diabetic 39.47% and 1 having other complaints 2.63%.

S.no	precipitating factor	No. of patients	Percentage(%)
1	Hypertension	10	26.31
2	Diabetes mellitus	15	39.47
3	Trauma	0	0
4	Cerebral tumour	0	0
5	Syphilis	0	0
6	Miscellaneous	1	2.63



15. CLINICAL PRESENTATION

Among 38 Patients clinical presentation of the patients are noted as follows

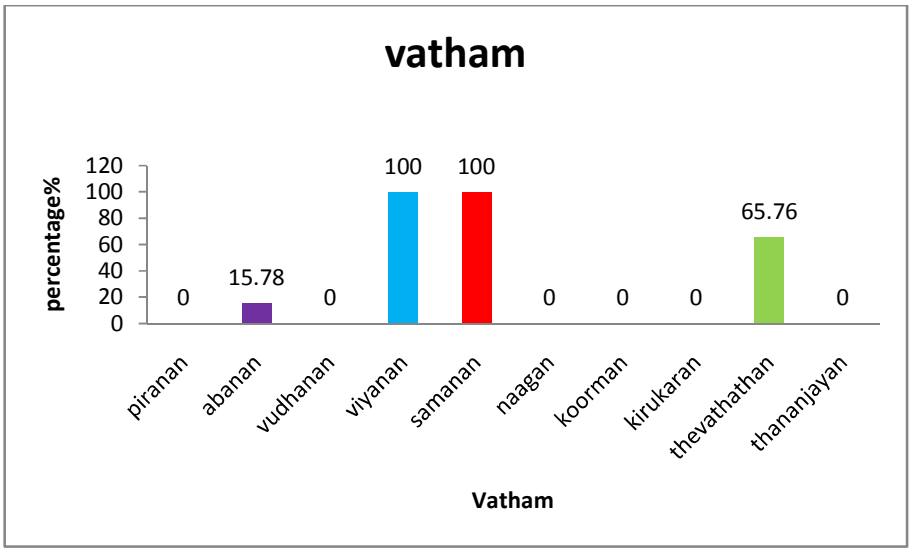
S.no	Clinical symptoms	No. Of patients	Percentage(%)
1.	Difficulty to use left upper limb and lower limb	20	52.63
2.	Difficulty to use right upper limb and lower limb	18	47.36
3.	Deviation of angle of mouth	24	63.15
4.	Dripping of saliva	0	0
5.	Difficulty in speech	24	63.15
6.	Difficulty in closing eyes	0	0
7.	Difficulty in swallowing	0	0
8.	Breathlessness	0	0
9.	Excessive thrust	0	0
10.	Frequency of micturition	0	0
11.	Head ache	4	10.52
12.	Past history of similar episode	1	2.63
13.	Circumduction gait	38	100
14.	Giddiness	0	0
15.	Epilepsy	1	2.63
16.	Clubbing	0	0
17.	Anaemia	3	7.89
18.	Pedal oedema	1	2.63
19.	Normal higher interLectual function	0	0
20.	Muscle wasting	8	21.05
21.	Constipation	5	13.5
22.	Consciousness defect	0	0
23.	Orientation defect	0	0
24.	Lymphadenopathy	0	0

16. CLINICAL PRESENTATION

VATHAM

Among 38 patients Viyanan and Samanan are affected in all patients 100%, Abanan were affected in 6 patients 15.78%, Devadathan were affected in 25 patients. 65.78%

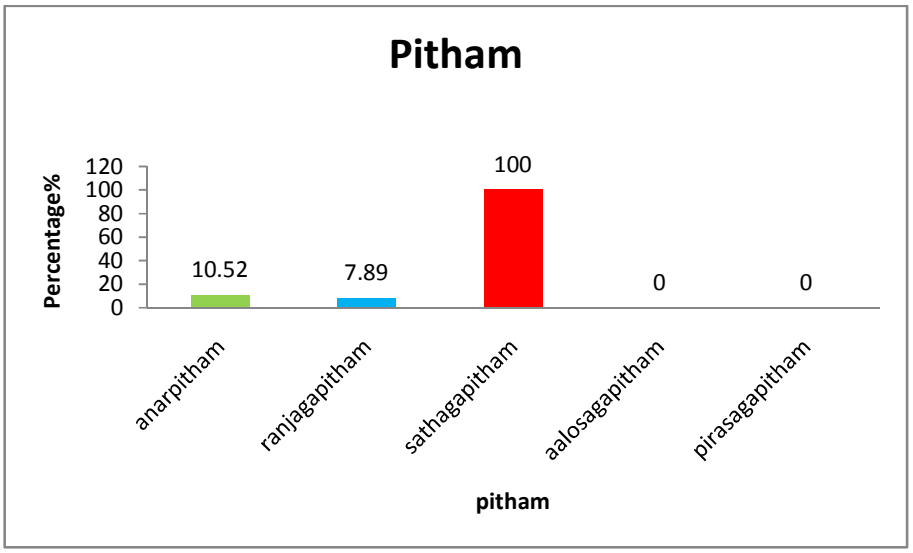
S.no	Vatham	No. Of patients	Percentage(%)
1	Piranan	0	0
2	Abanan	6	15.78
3	Vudhanan	0	0
4	Viyanan	38	100
5	Samanan	38	100
6	Naagan	0	0
7	Koorman	0	0
8	Kirukaran	0	0
9	Thevathathan	25	65.78
10	Thananjayan	0	0



PITHAM

Among 38 patients Sathaga pitham was affected in all patients 100%, Anarpitham was affected in 4 patients, 10.52% and Ranjagapitham were affected in 3 patients 7.89%

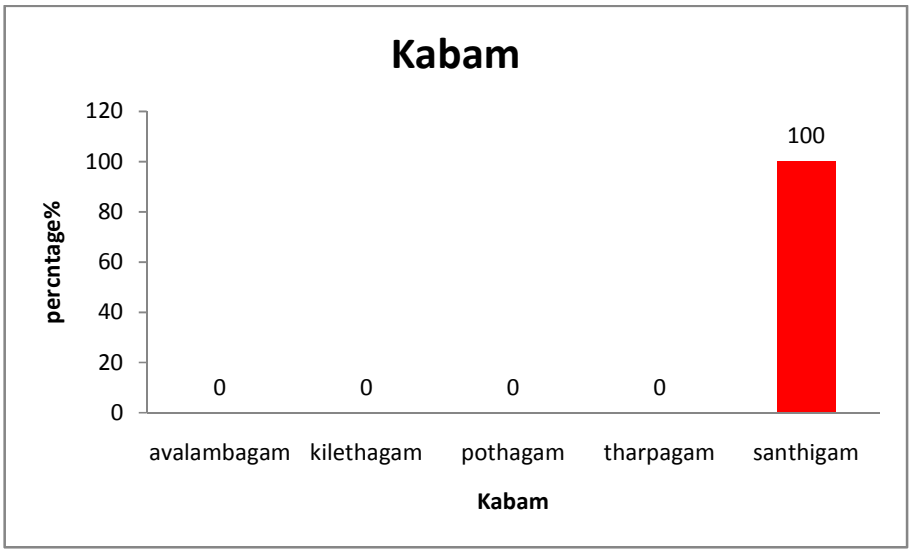
S.no	Pitham	No. of patients	Percentage(%)
1	Anarpitham	4	10.52
2	Ranjagapitham	3	7.89
3	Sathagapitham	38	100
4	Aalosagapitham	0	0
5	pirasagapitham	0	0



KABAM

Among 38 patients Santhigam was affected in all patients 100%.

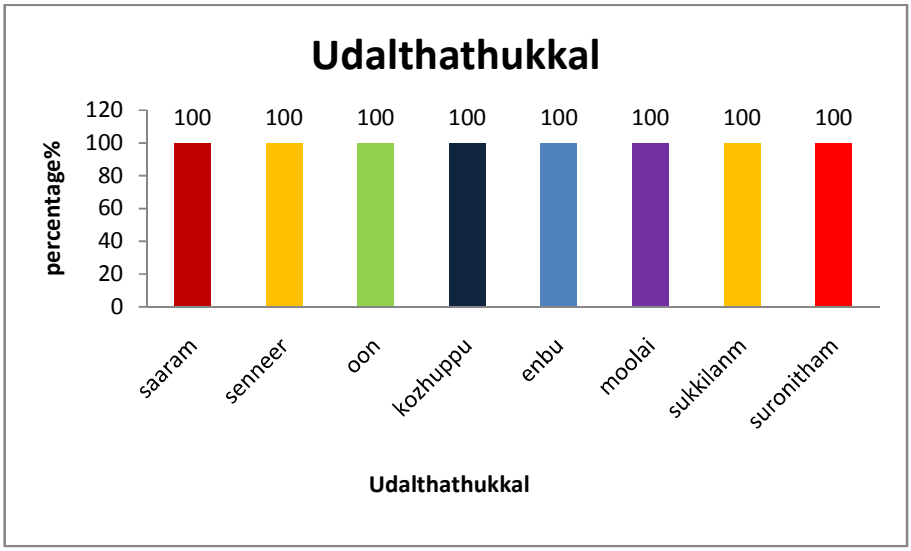
S.no	Kabam	No. Of patients	Percentage(%)
1	Avalambagam	0	0
2	Kilethagam	0	0
3	Pothagam	0	0
4	Tharpagam	0	0
5	Santhigam	38	100



17.CONDITION OF UDAL THATHUKKAL

Among 38 patients all Udal thathukkal were affected in all patients 100%

S.no	Udal thathukkal	No. Of patients	Percentage(%)
1	Saaram	38	100
2	Senneer	38	100
3	Oon	38	100
4	Kozhuppu	38	100
5	Enbu	38	100
6	Moolai	38	100
7	Sukkilam / suronitham	38	100



18. EFFECT OF TRAIL DRUG

By treating with trial drug only 30.76% patients had good improvement, 46.15% of patients had moderate improvement and 23.07% of patients had mild effect.

S.no	Effect of therapy	No. Of patients	Percentage(%)
1	Marked effect	4	30.76
2	Moderate effect	6	46.15
3	Mild effect	3	23.07

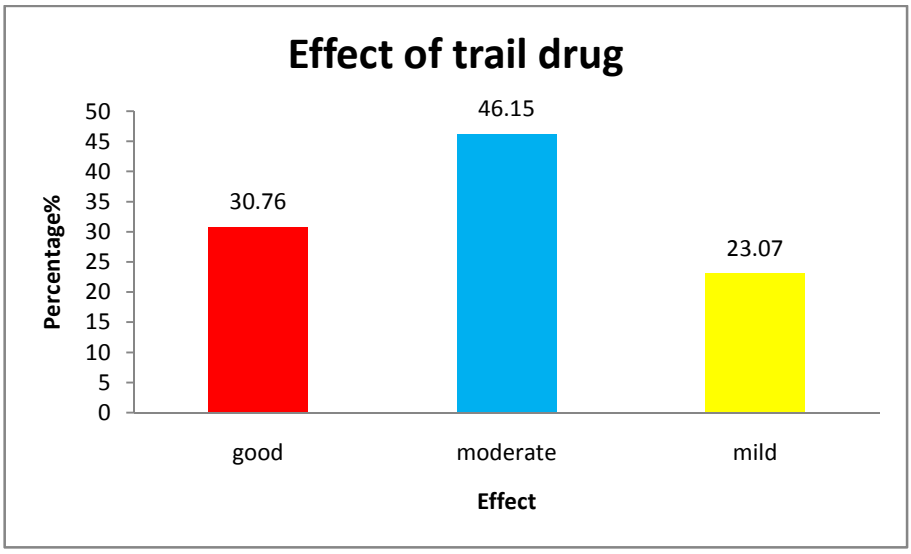


TABLE 19. EFFECT OF COMPLEMENTORY THERAPY ALONG WITH TRAIL DRUG(VARMAM)

By treating trail drug along with complementary therapy (Varmam) 30 % patients had good improvement, 40 % of patients had Moderate improvement, 30 % of patients had Mild Improvement.

S.no	Effect of therapy	No. Of patients	Percentage(%)
1	Good	3	30
2	Moderate effect	4	40
3	Mild effect	3	30

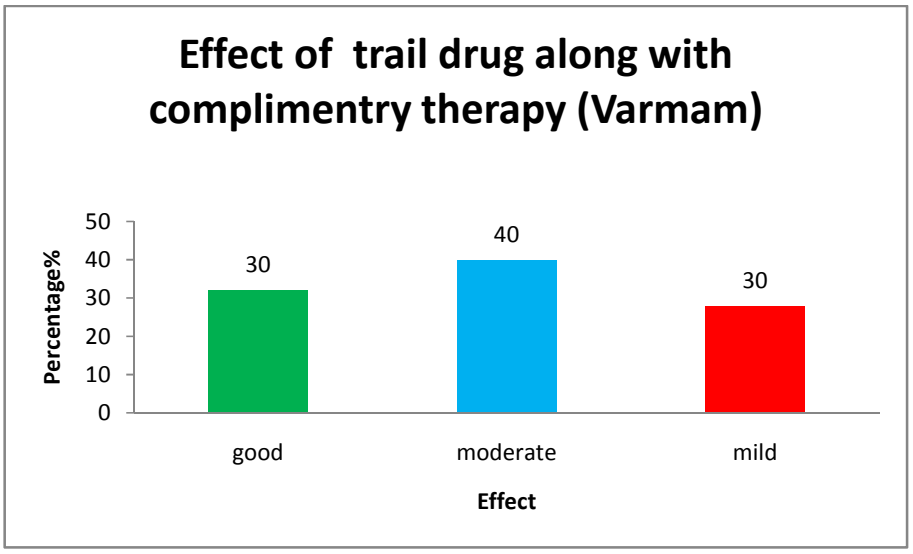


TABLE 20. EFFECT OF THERAPY ALONG WITH TRAIL DRUG (MASSAGE)

By treating trail drug along with complementary therapy (Massage) 20 % patients had good improvement, 50 % of patients had Moderate improvement, 30 % of patients had Mild Improvement.

S.no	Effect of therapy	No. Of patients	Percentage(%)
1	Marked effect	2	20
2	Moderate effect	5	50
3	Mild effect	3	30

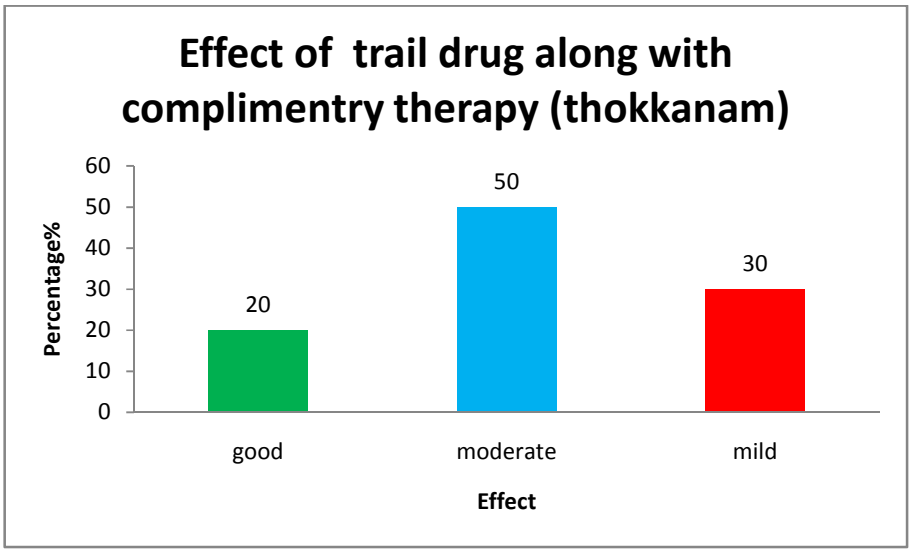
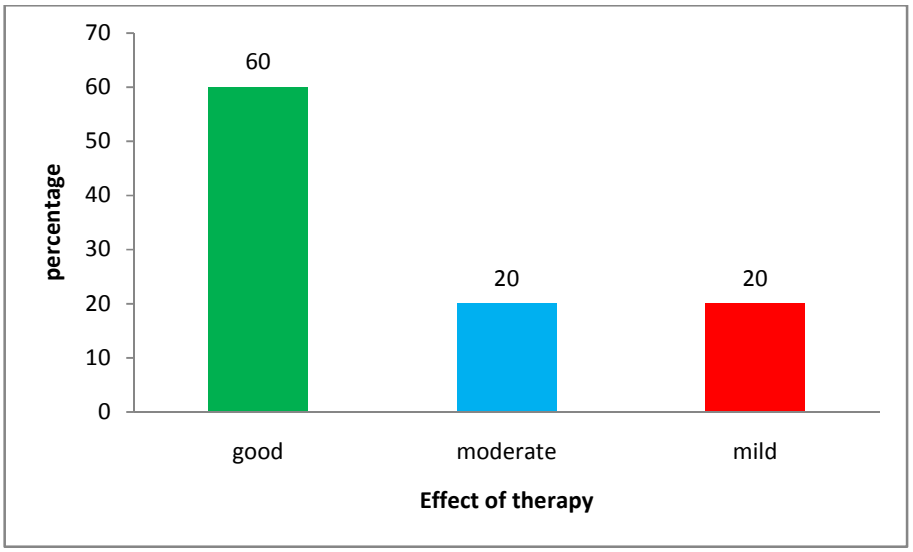


TABLE 21. EFFECT OF THERAPY ALONG WITH TRAIL DRUG (MASSAGE & VARMAM)

By treating trail drug along with complementary therapy (Massage & Varmam) 60 % patients had good improvement, 20 % of patients had Moderate improvement,20 % of patients had Mild Improvement.

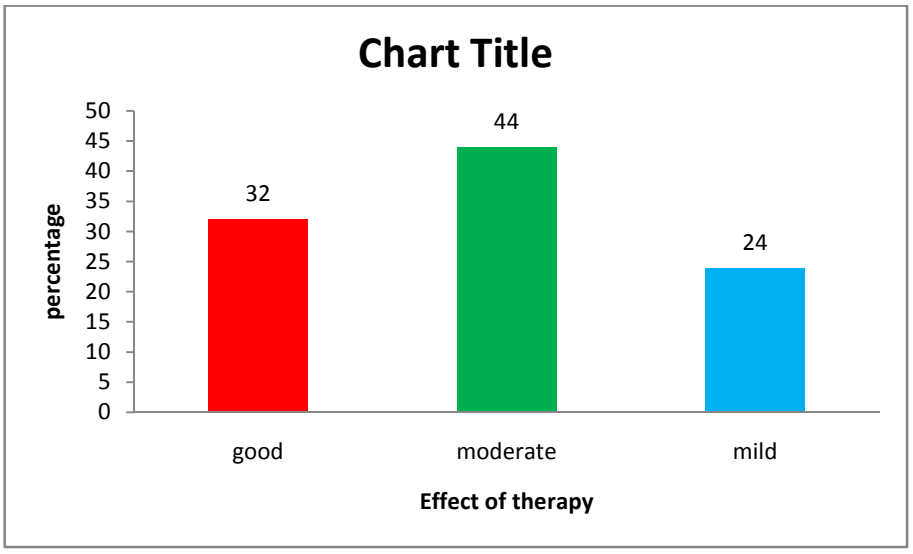
S.no	Effect of therapy	No. Of patients	Percentage(%)
1	Marked effect	3	60
2	Moderate effect	1	20
3	Mild effect	1	20



22. EFFECT OF THERAPY

By treating with compliment therapy 32% patients had good improvement, 44% of patients had moderate improvement and 24% of patients had mild effect.

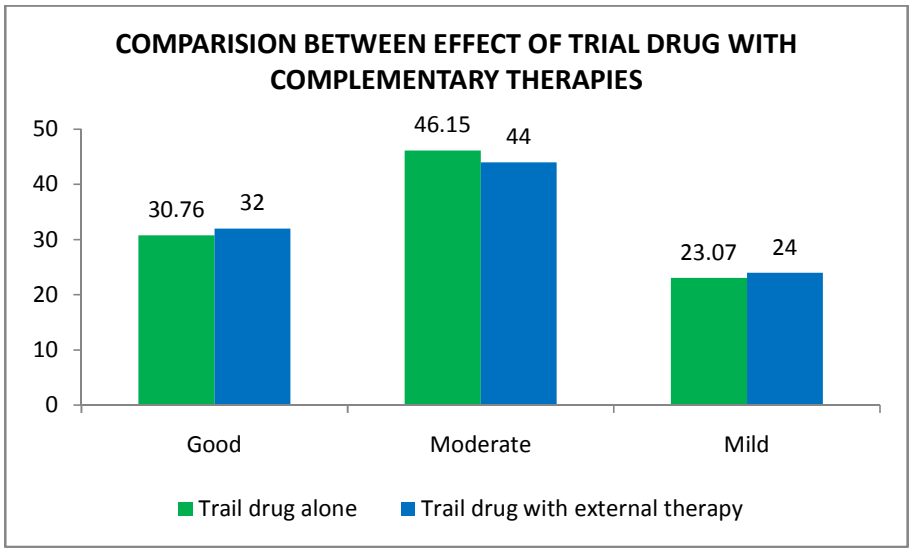
S.no	Effect of therapy	No. Of patients	Percentage(%)
1	Marked effect	8	32
2	Moderate effect	11	44
3	Mild effect	6	24



20.COMPARISON BETWEEN EFFECTIVE OF TRAIL DRUG WITH COMPLEMENTARY THERAPIES

By treating trial drug with compliment therapy 31.57% patients had good improvement, 44.73% of patients had moderate improvement and 23.68% of patients had mild effect.

S.no	Effect of therapy	Trail drug alone		Trail drug with external therapy	
		No.Of cases	percentage	No.Of cases	Percentage
1	Good	4	30.76	8	32
2	Moderate	6	46.15	11	44
3	Mild	3	23.07	6	24



LIST OF OUT PATIENTS OF PG III SIRAPPU MARUTHUVAM DEPARTMENT GIVEN

1.VISHNU CHAKRA MATHIRAI – INTERNAL 2.KODIVELI THYLAM – EXTERNAL

S.no	Op.no	Name	Age/sex	Occupation	Diagnosis	Date of registration	Date of completion of treatment	No. Of days treated	Result
1	65222	KANNAN	43/M	AGRICULTURAL	PV(L)	31-07-2017	16-09-2017	48	MODERATE
2	71413	KRISHNAN	60/M	AGRICULTURAL	PV(R)	20-08-2017	06-10-2017	48	MILD
3	77381	CHELLA DURAI	50/M	AGRICULTURAL	PV(R)	08-09-2017	25-10-2017	48	MODERATE
4	99459	MARIAPPAN	32/M	AGRICULTURAL	PV(R)	11-11-2017	25-12-2017	48	GOOD
5	104148	SUBRAMANIYAN	39/M	AGRICULTURAL	PV(R)	24-11-2017	10-12-2017	48	MODERATE
6	104514	SHAM	31/M	AGRICULTURAL	PV(L)	25-11-2017	11-12-2017	48	GOOD
7	105078	NIJAM	50/M	SHOPKEEPER	PV(L)	27-11-2017	13-12-2017	48	MODERATE
8	107775	KANAGARAJ	47/M	AGRICULTURAL	PV(R)	06-12-2017	22-01-2018	48	MILD
9	108670	LAKSHMI	34/F	HOUSE WIFE	PV(R)	08-12-2017	24-01-2018	48	GOOD
10	110436	SENTHIL KUMAR	35/M	AGRICULTURAL	PV(L)	14-12-2017	30-01-2018	48	MODERATE
11	4981	YESUVADIYAN	59/M	AGRICULTURAL	PV(R)	13-01-2018	29-02-2018	48	MILD
12	6480	CHELLAMAL	65/F	HOUSE WIFE	PV(L)	19-01-2018	05-03-2018	48	MILD
13	8145	MUTHAIYA	52/M	AGRICULTURAL	PV(L)	24-01-2018	10-03-2018	48	MILD

LIST OF IN PATIENTS OF PG III SIRAPPU MARUTHUVAM DEPARTMENT GIVEN

1.VISHNU CHAKRA MATHIRAI – INTERNAL 2.KODIVELI THYLAM – EXTERNAL

S.NO	IP.NO	NAME	AGE/SEX	OCCUPATION	DATE OF ADMISSION	DATE OF DISCHARGE	TOTAL NO. OF DAYS TREATED		TOTAL NO. OF DAYS	RESULT
							IP	OP		
1	2345	SELVI	45/F	HOUSE WIFE	22-08-2017	29-09-2017	38	10	48 DAYS	MODERATE
2	2559	PITCHAMMAL	60/F	HOUSE WIFE	15-09-2017	24-10-2017	41	7	48 DAYS	MODERATE
3	2999	PITCHAIYA	59/M	COOLI	08-11-2017	31-12-2017	54	-	48 DAYS	MODERATE
4	3000	MUTHAIYA	59/M	COOLI	08-11-2017	29-12-2017	52	-	48 DAYS	GOOD
5	3013	SUBRAMANIYAN	39/M	AGRICULTURAL	10-11-2017	04-12-2017	25	23	48 DAYS	GOOD
6	3014	SAKTHIVEL	28/M	FACTORY WORK	10-11-2017	02-12-2017	23	25	48 DAYS	MILD
7	3023	THANGA PAUNDI	37/M	CLERK	13-11-2017	04-12-2018	22	26	48 DAYS	GOOD
8	3090	RAJASEKAR	59/M	AGRICULTURAL	20-11-2017	08-01-2018	49	-	48 DAYS	GOOD
9	3096	THANGA NADATHI	70/F	AGRICULTURAL	20-11-2017	07-12-2017	18	30	48 DAYS	MILD
10	3109	CITTU	57/F	AGRICULTURAL	23-11-2017	07-12-2017	15	23	48 DAYS	MODERATE
11	3185	SAKTHIVEL	57/M	BEEDI WORKER	05-12-2017	07-01-2018	34	14	48 DAYS	MODERATE
12	3224	JOHN PETER	50/M	AGRICULTURAL	10-12-2017	27-01-2018	48	-	48 DAYS	MODERATE
13	3228	AASIRVATHAM	45/M	OFFICE WORK	10-12-2017	27-01-2018	49	-	48 DAYS	GOOD
14	3263	MARIYADOSS	60/M	COOLI	13-12-2017	12-01-2018	31	17	48 DAYS	MILD
15	3309	RAJANARAYANAN	45/M	AGRICULTURAL	18-12-2017	04-02-2018	49	-	48 DAYS	MILD
16	3335	RAJARATHINAM	58/M	FACTORY WORK	22-12-2017	25-01-2018	35	13	48 DAYS	GOOD
17	12	JEYALAKSHMI	55/F	BEEDI WORKER	02-01-2018	10-01-2018	9	39	48 DAYS	MILD
18	75	ESSAKKI	65/M	COOLI	17-01-2018	28-02-2018	43	5	48 DAYS	MODERATE
19	146	SARASWATI AMMAL	82/F	HOUSE WIFE	22-01-2018	05-02-2018	15	33	48 DAYS	MILD
20	171	MURUGAN	37/M	DRIVER	24-01-2018	13-03-2018	51	-	48 DAYS	MODERATE
21	186	DURAI PAUNDI	38/M	OFFICE WORK	25-01-2018	06-03-2018	43	5	48 DAYS	MODERATE
22	235	THIRAVIYA KANI	50/M	COOLI	30-01-2018	16-03-2018	48	-	48 DAYS	GOOD
23	241	SUBBURAJ	45/M	AGRICULTURAL	30-01-2018	11-03-2018	43	5	48 DAYS	MODERATE
24	369	VEMBAN	65/M	AGRICULTURAL	12-02-2018	13-03-2018	32	15	48 DAYS	GOOD
25	378	SANTHIYAPPAN	42M	COOLI	12-02-2018	11-03-18	30	18	48 DAYS	MILD

EXAMINATION OF POWER

S.No	Ip.No	Before And After Treatment	Shoulder		Elbow		Wrist		Hip		Knee		Ankle		Result
			Abd	Add	Flx	Ext	Flx	Ext	Abd	Add	Flx	Ext	Flx	Ext	
1	2345	BT AT	0/5 2/5	0/5 2/5	0/5 2/5	0/5 2/5	0/5 0/5	0/5 0/5	1/5 2/5	1/5 2/5	1/5 2/5	1/5 2/5	1/5 1/5	1/5 1/5	MODERATE
2	2559	BT AT	2/5 3/5	2/5 3/5	1/5 2/5	1/5 2/5	0/5 1/5	0/5 1/5	2/5 2/5	2/5 2/5	2/5 2/5	2/5 2/5	1/5 2/5	1/5 2/5	MODERATE
3	2999	BT AT	3/5 4/5	3/5 4/5	3/5 4/5	3/5 4/5	2/5 3/5	2/5 3/5	2/5 3/5	2/5 3/5	2/5 3/5	2/5 3/5	2/5 3/5	2/5 3/5	MODERATE
4	3000	BT AT	0/5 3/5	0/5 3/5	0/5 3/5	0/5 3/5	0/5 1/5	0/5 1/5	0/5 3/5	0/5 3/5	0/5 3/5	0/5 2/5	0/5 2/5	0/5 2/5	GOOD
5	3013	BT AT	2/5 4/5	2/5 4/5	2/5 4/5	2/5 4/5	2/5 4/5	2/5 4/5	3/5 4/5	3/5 4/5	3/5 4/5	3/5 4/5	3/5 4/5	3/5 4/5	GOOD

S.No	Ip.No	Before And After Treatment	Shoulder		Elbow		Wrist		Hip		Knee		Ankle		Result
			Abd	Add	Flx	Ext	Flx	Ext	Abd	Add	Flx	Ext	Flx	Ext	
6	3014	BT AT	2/5 3/5	2/5 3/5	2/5 3/5	2/5 3/5	0/5 0/5	0/5 0/5	2/5 2/5	2/5 2/5	2/5 2/5	2/5 2/5	1/5 2/5	1/5 2/5	MILD
7	3023	BT AT	0/5 3/5	0/5 3/5	0/5 3/5	0/5 3/5	0/5 2/5	0/5 2/5	0/5 3/5	0/5 3/5	0/5 3/5	0/5 3/5	0/5 3/5	0/5 3/5	GOOD
8	3090	BT AT	2/5 4/5	2/5 4/5	2/5 4/5	2/5 4/5	2/5 3/5	2/5 3/5	2/5 3/5	2/5 3/5	3/5 4/5	3/5 4/5	3/5 4/5	3/5 4/5	GOOD
9	3090	BT AT	0/5 2/5	0/5 2/5	0/5 2/5	0/5 2/5	0/5 0/5	0/5 0/5	0/5 2/5	0/5 2/5	0/5 2/5	0/5 2/5	0/5 2/5	0/5 2/5	MILD
10	3109	BT AT	3/5 4/5	3/5 4/5	3/5 4/5	3/5 4/5	1/5 2/5	1/5 2/5	2/5 2/5	3/5 4/5	3/5 4/5	3/5 4/5	2/5 2/5	2/5 2/5	MODERATE

S.No	Ip.No	Before And After Treatment	Shoulder		Elbow		Wrist		Hip		Knee		Ankle		Result
			Abd	Add	Flx	Ext	Flx	Ext	Abd	Add	Flx	Ext	Flx	Ext	
11	3185	BT AT	3/5 4/5	3/5 4/5	3/5 4/5	3/5 4/5	2/5 3/5	3/5 3/5	3/5 3/5	3/5 3/5	3/5 3/5	3/5 3/5	2/5 3/5	2/5 3/5	MODERATE
12	3224	BT AT	2/5 3/5	2/5 3/5	2/5 3/5	2/5 3/5	1/5 2/5	1/5 2/5	2/5 3/5	2/5 3/5	2/5 3/5	2/5 3/5	2/5 3/5	2/5 3/5	MODERATE
13	3228	BT AT	2/5 4/5	2/5 4/5	2/5 4/5	2/5 4/5	2/5 3/5	2/5 3/5	3/5 4/5	3/5 4/5	3/5 4/5	3/5 4/5	2/5 3/5	2/5 3/5	GOOD
14	3263	BT AT	2/5 3/5	2/5 3/5	2/5 3/5	2/5 3/5	0/5 0/5	2/5 2/5	2/5 3/5	2/5 3/5	2/5 3/5	2/5 3/5	1/5 2/5	1/5 2/5	MILD
15	3309	BT AT	2/5 3/5	2/5 3/5	2/5 3/5	2/5 3/5	0/5 0/5	0/5 0/5	2/5 2/5	2/5 2/5	2/5 2/5	2/5 2/5	1/5 2/5	1/5 2/5	MILD

S.No	Ip.No	Before And After Treatment	Shoulder		Elbow		Wrist		Hip		Knee		Ankle		Result
			Abd	Add	Flx	Ext	Flx	Ext	Abd	Add	Flx	Ext	Flx	Ext	
16	3335	BT	0/5	0/5	0/5	0/5	0/5	2/5	3/5	3/5	3/5	3/5	0/5	0/5	**GOOD**
		AT	3/5	3/5	3/5	3/5	1/5	4/5	4/5	4/5	4/5	4/5	2/5	2/5	
17	12	BT	2/5	2/5	2/5	2/5	0/5	2/5	2/5	2/5	2/5	2/5	1/5	1/5	**MILD**
		AT	3/5	3/5	3/5	3/5	0/5	2/5	3/5	3/5	3/5	3/5	2/5	2/5	
18	75	BT	2/5	2/5	2/5	2/5	2/5	2/5	3/5	3/5	3/5	3/5	3/5	3/5	**MODERATE**
		AT	4/5	4/5	4/5	4/5	4/5	4/5	4/5	4/5	4/5	4/5	4/5	4/5	
19	146	BT	0/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5	**MILD**
		AT	2/5	2/5	2/5	2/5	0/5	0/5	2/5	2/5	2/5	2/5	2/5	2/5	
20	171	BT	3/5	3/5	3/5	3/5	2/5	2/5	3/5	3/5	3/5	3/5	3/5	3/5	**MODERATE**
		AT	4/5	4/5	4/5	4/5	2/5	2/5	3/5	3/5	3/5	3/5	3/5	3/5	

S.No	Ip.No	Before And After Treatment	Shoulder		Elbow		Wrist		Hip		Knee		Ankle		Result
			Abd	Add	Flx	Ext	Flx	Ext	Abd	Add	Flx	Ext	Flx	Ext	
21	186	BT	**3/5**	**3/5**	**3/5**	**3/5**	**2/5**	**2/5**	**3/5**	**3/5**	**3/5**	**3/5**	**3/5**	**3/5**	**MODERATE**
		AT	**4/5**	**4/5**	**4/5**	**4/5**	**3/5**	**3/5**	**4/5**	**4/5**	**3/5**	**3/5**	**3/5**	**3/5**	
22	235	BT	**2/5**	**2/5**	**2/5**	**2/5**	**2/5**	**2/5**	**2/5**	**2/5**	**3/5**	**3/5**	**3/5**	**3/5**	**GOOD**
		AT	**4/5**	**4/5**	**4/5**	**4/5**	**3/5**	**3/5**	**3/5**	**3/5**	**4/5**	**4/5**	**4/5**	**4/5**	
23	241	BT	**3/5**	**3/5**	**3/5**	**3/5**	**1/5**	**1/5**	**3/5**	**3/5**	**3/5**	**3/5**	**3/5**	**3/5**	**MODERATE**
		AT	**4/5**	**4/5**	**4/5**	**4/5**	**2/5**	**2/5**	**3/5**	**3/5**	**4/5**	**4/5**	**3/5**	**3/5**	
24	369	BT	2/5	2/5	2/5	2/5	2/5	2/5	3/5	3/5	3/5	3/5	3/5	3/5	**GOOD**
		AT	4/5	4/5	4/5	4/5	4/5	4/5	4/5	4/5	4/5	4/5	4/5	4/5	
25	378	BT	**2/5**	**2/5**	**2/5**	**2/5**	**0/5**	**2/5**	**2/5**	**2/5**	**2/5**	**2/5**	**1/5**	**1/5**	**MILD**
		AT	**3/5**	**3/5**	**3/5**	**3/5**	**0/5**	**2/5**	**3/5**	**3/5**	**3/5**	**3/5**	**2/5**	**2/5**	

EXAMINATION OF CRANIAL NERVES

S.no	Ip. No	Olfactory nerve	Optic nerve	Occulomotor nerve	Trochlear nerve	Trigeminal nerve	Abducent nerve	Facial nerve	Auditory nerve	Glosso pharyngeal nerve	Vagus nerve	Accessory nerve	Hypoglossal nerve
1	2345	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
2	2559	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
3	2999	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
4	3000	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
5	3013	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
6	3014	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
7	3023	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
8	3090	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
9	3096	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
10	3109	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
11	3185	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
12	3224	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
13	3228	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL

14	3263	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
15	3309	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
16	3335	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
17	12	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
18	75	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
19	146	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
20	171	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
21	186	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
22	235	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
23	241	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
24	369	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
25	378	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	AFFECTED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL

BLOOD INVESTIGATION BEFORE AND AFTER TREATMENT – OP PATIENT

S.NO	OP.NO	TC		DC										HB		ESR		BLOOD SUGAR				BLOOD		SERUM	
				N		L		E		B		M						F		PP		UREA		CHOLESTEROL	
		BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
1	65222	8400	7900	64	63	32	34	4	3	0	0	0	0	9.5	9.9	34	28	89	85	149	140	34	29	179	165
2	71413	7400	7600	72	69	25	28	3	3	0	0	0	0	13.1	13	22	19	124	118	168	155	40	31	208	201
3	77381	6900	6700	64	62	33	36	3	2	0	0	0	0	11.8	11.9	25	20	96	92	176	168	29	22	199	187
4	99459	7800	7400	65	64	31	32	4	4	0	0	0	0	9.6	10.1	34	25	108	102	189	172	36	22	221	201
5	104148	7200	7500	59	61	36	34	5	5	0	0	0	0	12.5	12.7	25	19	136	127	167	156	29	25	196	185
6	104514	7700	7300	62	64	32	34	6	2	0	0	0	0	13.5	13.6	31	23	122	108	154	146	37	31	167	157
7	105078	7500	8100	64	67	29	29	7	4	0	0	0	0	12.1	12.4	15	10	97	92	149	135	28	27	185	176
8	107775	8200	7900	69	69	28	29	3	2	0	0	0	0	12.8	12.9	32	21	142	128	165	148	35	32	139	127
9	108670	9200	9000	70	70	26	25	4	5	0	0	0	0	10.9	11.1	30	19	136	128	159	139	42	37	165	157
10	110436	7300	7100	66	67	33	31	1	2	0	0	0	0	13.5	13.7	28	19	99	90	149	132	29	22	159	149
11	4981	7800	7700	59	61	37	36	4	3	0	0	0	0	12.2	12.4	27	20	106	97	167	165	37	34	186	172
12	6480	6700	6900	61	62	34	34	5	4	0	0	0	0	11.8	12.2	26	18	121	118	172	159	19	15	194	188
13	8145	8800	8400	63	65	35	34	2	1	0	0	0	0	12.2	12.4	19	11	129	117	179	161	22	19	186	174

BLOOD INVESTIGATION BEFORE AND AFTER TREATMENT – IP PATIENT

S.NO	IP.NO	TC		DC										HB		ESR		BLOOD SUGAR				BLOOD UREA		SERUM CHOLESTEROL	
				N		L		E		B		M						F		PP					
		BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
1	2345	7300	7100	62	64	33	32	5	4	0	0	0	0	12.2	12.2	32	24	80	78	115	102	8	12	172	119
2	2559	7200	7600	65	67	32	31	3	2	0	0	0	0	13	12.4	12	10	91	88	121	110	20	18	190	182
3	2999	7800	7300	61	63	37	36	2	1	0	0	0	0	11	13.3	8	6	86	74	110	100	16	15	216	195
4	3000	9300	9000	59	58	41	40	0	2	0	0	0	0	13.1	13.3	15	12	110	96	142	120	24	12	126	115
5	3013	8800	8600	70	74	26	26	4	0	0	0	0	0	11.6	11.8	40	30	81	74	112	100	23	25	187	165
6	3014	7400	7800	66	65	29	32	5	3	0	0	0	0	12.0	12.3	12	10	135	120	155	134	16	15	175	168
7	3023	8100	8600	57	58	37	42	6	0	0	0	0	0	12.0	12.6	15	10	99	96	118	103	31	18	166	152
8	3090	7800	8200	64	68	32	30	4	2	0	0	0	0	9.5	9.8	20	15	92	89	120	99	27	21	150	135
9	3096	6900	7200	73	75	23	25	4	0	0	0	0	0	13.1	13.2	18	13	143	120	180	164	25	22	175	162
10	3109	8800	8900	76	78	21	20	3	2	0	0	0	0	12.6	12.8	4	3	98	90	122	102	20	22	210	186
11	3185	8400	8300	65	68	31	30	4	2	0	0	0	0	11.4	11.9	22	11	88	83	115	104	27	21	147	126
12	3224	7300	7200	61	66	38	31	1	3	0	0	0	0	11.8	11.9	26	12	90	88	118	99	18	20	245	223
13	3228	9100	9400	58	66	37	34	5	0	0	0	0	0	9	9.2	24	12	86	84	110	95	16	22	135	121
14	3263	7000	7400	64	68	30	30	6	2	0	0	0	0	12	12	7	6	180	99	366	175	34	21	197	172
15	3309	7600	7700	61	59	31	38	6	3	0	0	0	0	12.1	12.2	40	20	106	79	131	96	26	22	140	122
16	3335	6400	6600	65	69	32	27	3	4	0	0	0	0	9.6	12.2	21	11	86	99	117	98	34	31	185	173
17	12	8200	8400	66	68	31	32	3	0	0	0	0	0	11.1	9.9	12	8	111	96	132	111	16	12	220	196
18	75	7700	7600	69	70	29	28	7	2	0	0	0	0	12.2	11.3	16	9	108	86	146	102	41	17	165	142
19	146	7300	7800	65	73	31	24	4	3	0	0	0	0	10.5	13.6	10	7	92	84	116	97	8	22	210	185
20	171	7400	7600	55	65	27	32	5	3	0	0	0	0	13.5	11	22	11	95	84	110	92	36	21	170	176
21	186	7900	8200	71	74	27	26	2	0	0	0	0	0	12.8	13.6	4	3	90	70	121	90	22	24	195	157
22	235	9000	9300	66	70	31	27	3	3	0	0	0	0	11	12.9	20	13	89	80	106	88	24	26	175	176
23	241	7600	7300	76	78	20	17	4	5	0	0	0	0	10.5	11.3	11	9	84	70	108	84	22	25	150	147
24	369	8300	8300	64	76	28	22	5	2	0	0	0	0	12.4	11	33	20	73	84	99	80	18	22	126	132
25	378	6000	6200	60	78	35	21	5	1	0	0	0	0	13.5	12.5	26	14	92	95	124	100	27	30	164	148

URINE EXAMINATION BEFORE & AFTER TREATMENT – OUT PATIENTS

S.no	Op.no	Before treatment			After treatment		
		Albumin	Sugar	Deposit	Albumin	Sugar	Deposit
1	65222	NIL	NIL	NAD	NIL	NIL	NAD
2	71413	NIL	NIL	NAD	NIL	NIL	NAD
3	77381	NIL	NIL	NAD	NIL	NIL	NAD
4	99459	TRACE	+	1-2 PUS CELLS	NIL	NIL	NAD
5	104148	NIL	NIL	NAD	NIL	NIL	NAD
6	104514	NIL	NIL	NAD	NIL	NIL	NAD
7	105078	NIL	NIL	NAD	NIL	NIL	NAD
8	107775	NIL	NIL	NAD	NIL	NIL	NAD
9	108670	TRACE	NIL	NAD	Trace	NIL	NAD
10	110436	NIL	NIL	NAD	NIL	NIL	NAD
11	4981	NIL	+	NAD	NIL	NIL	NAD
12	6480	NIL	NIL	NAD	NIL	NIL	NAD
13	8145	NIL	NIL	NAD	NIL	NIL	NAD

URINE EXAMINATION BEFORE & AFTER TREATMENT – IN PATIENTS

S.no	Ip.no	Before treatment			After treatment		
		Albumin	Sugar	Deposit	Albumin	Sugar	Deposit
1	2345	NIL	NIL	NAD	NIL	NIL	NAD
2	2559	NIL	NIL	NAD	NIL	NIL	NAD
3	2999	NIL	NIL	NAD	NIL	NIL	NAD
4	3000	NIL	NIL	NAD	NIL	NIL	NAD
5	3013	NIL	NIL	NAD	NIL	NIL	NAD
6	3014	Trace	+	NAD	Trace	NIL	NAD
7	3023	NIL	NIL	NAD	NIL	NIL	NAD
8	3090	NIL	NIL	NAD	NIL	NIL	NAD
9	3096	Trace	NIL	NAD	NIL	NIL	NAD
10	3109	NIL	NIL	NAD	NIL	NIL	NAD
11	3185	NIL	NIL	2-3 pus cells	NIL	NIL	NAD
12	3224	NIL	NIL	NAD	NIL	NIL	NAD
13	3228	NIL	NIL	NAD	NIL	NIL	NAD
14	3263	Trace	++	NAD	Trace	NIL	NAD
15	3309	NIL	NIL	NAD	NIL	NIL	NAD
16	3335	NIL	NIL	NAD	NIL	NIL	NAD
17	12	NIL	NIL	NAD	NIL	NIL	NAD
18	75	Trace	NIL	NAD	NIL	NIL	NAD
19	146	NIL	NIL	NAD	NIL	NIL	NAD
20	171	NIL	NIL	NAD	NIL	NIL	NAD
21	186	NIL	NIL	NAD	NIL	NIL	NAD
22	235	NIL	NIL	NAD	NIL	NIL	NAD
23	241	NIL	NIL	NAD	NIL	NIL	NAD
24	369	NIL	NIL	NAD	NIL	NIL	NAD
25	378	NIL	NIL	NAD	NIL	NIL	NAD

DISCUSSION

Hemiplegia in the modern medicine charecterised by paralysis of one half of the body which can be more or less correlated with pakkavatham which is one of the vatha disease affecting one half of the body and interfering function of upper and lower limbs of one side and may associate with cranial nerve or not. The only literal evidence of this disease is found in the classification of vatha disease in yugi vaithiya chinthamani perunool-800 which gives the etiology and the clinical feature also

This dissertation works includes literary collections of observations both siddha and modern aspect of this disease. As per the symptamatology and the envagai thervugal and other siddha methods were selected and admitted 25 patients in IN-patient ward and 13 patients were selected in outpatient ward

On the dat of admission routine lab investigations (blood and urine test), radiological investigations, general and systemic examinations, neer kuri and nei kuri were done in all 25 ip patients. An individual case sheet was prepared and maintained to all the patients.

To fulfil the primary endeavours of the study, the trail drug given below was used in treating the disease pakkavatham.

Vishnu Chakra Mathirai (Internal)- 130 mg BD with Thirikadugu chooranam+ Inji juice+ Honey

Kodiveli Thylam (External)

Among the 25 IPD patients for 10 patients Massage and 10 patients Varmam and 5 patients treated with Varmam and Massage theraphy were given. All the patients were advised to follow the pathiyam. Another 13 patients were also treated with only the trial drug In the Outpatient ward

In order to execute the primary objectives of this study, an inclusive open clinical trial was done with the drugs in treating the disease pakkavatham

The clinical evaluation was done as per the protocol and the data were collected by using approved form. The disease pakkavatham was considered under various criteria to gather the secondary objectives of the study and the results were observed and tabulated. A variety of criteria and the results were discussed here under

Gender distribution:

From the above mentioned tabulation, among the 38 patients, 78.94% were male and 21.05% were female..

Age distribution:

This study shows high incidence of pakkavatham in 51-60 (31.5%) years of age. And the second largest incidence in 41-50 (26.3%) years. pakkavatham which is compared with hemiplegia which is a neurological disease, so the above inference explained the age is not much more significant in this disorder.

Kaalam distribution:

From the above mentioned tabulation, the highest incidence of pakkavatham to be in pitha kaalam

Occupational status:

In the study, among the 38 patients 17 patients were agricultural labours (44.73%), house wives(13.15%), office employee(7.89%), factory worker(5.26%), beedi worker(5.26%), driver(2.63%), others(21.05%).

In this study agricultural labours(44.73%) had high incidence of pakkavatham.

Seasonal variation:

From the above mentioned data 3 patients (7.89%)were admitted in kaar kaalam , 10 patients(26.31%) was admitted in koothir kaalam and 14 patients (36.84%) were admitted in munpani kaalam, 5 patients(13.15%) was admitted in elavenir kaalam. Most of the patients were admitted in munpani kaalam and koothir kaalam.

Our study period for this study was short and moreover the patients obtained from this study were participating in same area. So the above obtained result may not have a scientific value.

Thinai

From the above mentioned data, 33 (92.10%) cases were from marutham and 5(7.89%) cases were from neithal thinai

Hence the disease was studied in single area not globally, so it's difficult to come to conclusion by this above data to evaluate the thinai distribution scientifically.

Socio- economical status:

From the above data, the majority of the patient 33 (86.84%) were from middle class, 5 (13.15%)were low class.

Dietary habits:

Among the 38 patients, 1 patients were non- vegetarian (2.63%) and 2 patients was vegetarian(5.26%) and Mixed diet 35 (92.10%) .Mixed diet hapid patients were reported to be high incidence.

Precipitating factors:

Inferred result proves that the hypertention 10 (26.31%) and diabetes 15 (39.47%) were the most important precipitating factors

Gradation of results on pakkavatham

According to the prognosis of the pakkavatham, among the 25 in patient, good clinical result was seen in 8(32%). Moderate clinical result was seen in patients 10(40%). 7 patients (28%) had mild improvement.

Among 13 outpatient good clinical results was seen in 3 patients(7.89%). Moderate clinical result was seen in 5 patients (13.15%). Mild was seen in 5 patients (13.15%)

Interest to siddha treatment after stroke:

Among the 38 patients only 2 patients (5.26%)were treated in siddha system immediately after stroke with in 3 month, 3 patients (7.89%)were treated in siddha system within six months.

Clinical features:

According to this study, 100% of them had circumduction gait, deviation of mouth and difficulty in speech 24 patients (63.15%) of them had difficulty to use left upper and lower limbs 20 (52.63%) of them had difficulty to use right upper and lower limbs and 18 (47.36%) had past history of similar episodes 1(2.63%)of them had normal higher intellectual function.

Incidence of pakkavatham according to the side exists:

Among the 38 patients right side was affected in 20 patients (52.63%) left side was affected in 18 patients (47.36%) right side was affected

Reference to gunam:

Among the 38 patients, majority of them had raso gunam 26 patients (68.42%) and remaining 12 patients (31.57%) were thamo gunam

Distribution of three Thosam:

Vatham

From the above tabulation, samanan and viyanan were affected in 38 (100%)of cases, abanan were affected in 6 (15.78%) of cases, Devathathan were affected in 25(65.7%) of cases.

Pitham

Saathaga pitham affected in all the cases and ranjaga pitham was affected in 3 cases(7.89%) and anarpitham affected in 4 cases (10.52%)

Kabam

Santhigam were pretentious in all cases(100%)

Udal kattugal

Among the seven udal kattugal, saaram, senneer, oon, kozhuppu, enbu, moolai, sukkilam were found affected in all the cases(100%)

Investigations:

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

Pre clinical studies:

The Biochemical study of had revealed the presence of calcium, iron(ferrous), unsaturated compounds and amino acid.

Pharmacological studies:

The pharmacological studies done in Vishnu chakra mathirai revealed the presence of actions such as

- **Anti-inflammatory action**

  The pharmacological studies done in vishamushti thylam revealed that it has an anti- inflammatory action

- **Haemolytic activity**

  The pharmacological studies done in vishamushti thylam revealed that it has a haemolytic activity action

Toxicity study:

Acute toxicity and subacute studies have done for Vishnu chakra mathirai in rats and it is analyzed that they have no toxicity.

Treatment:

In our siddha system the line of treatment is chiefly intended to retain the deranged thoshas and thus relieved the symptoms of disease.

Before started treatment each patient was advised to take purgation by giving vellai ennai 15 ml with hot water in the morning time for first day.

From the second day onward internal medicine Vishnu chakra mathirai two times a day with honey after food and external medicine kodiveli thylam were given.

At the time of treatment the patient were advised to follow pathiyam and specifically advised to avoid foods which increase vadha.

Along with the course of treatment the complimentary therapies like massage and varmam theraphy were given additionally

The outcome of the disease mainly assessed by the ability to perform the day to day activities well, increased range of movements and improvement in quality of life.

Assessment scale was also used to detect proper outcome. No adverse effect was noted for both internal and external medicine along with the course of treatment.

Out of 38 patients good relief was seen in 11(28.94%) patients, they were marked with normal blood pressure, no giddiness and improvement in using the affected side. Moderate relief was seen in 15(39.47%) patients, they were marked with normal blood pressure, and some improvement in using the affected side. Mild relief was seen in 12(31.57%) patients, they were marked with normal blood pressure and mild improvement in affected limbs.

SUMMARY

The research work on pakkavatham was chosen with an intention to give solance to the patients who are suffering from the disease. The disease hemiplegia was comparatively studied with the disease pakkavatham with reference to its etiology, clinical featurea and pathogenesis. The author had a chance of referring many siddha literature and collected more information.

Vishnu chakramathirai is a internal drug and kodiveli thylam is a external medicine was chosen and a clinical trial in Govt, siddha medical college, palayamkottai was conducted with these drugs. For this 38 cases were selected in which 13 were treated in out patient ward and remaining 25 were in in patient ward. The preclinical studies of the trial drug were initiating to be encouraging.

Pharmacological analysis of vishnuchakra mathirai shows

- Anti inflammatory action and
- Haemolytic activity

Since, complimentary therapies or manual therapies like massage and varmam plays a significant role in treatment of hemiplegia. Some of the complimentary therapy from siddha system are manipulated along with trial drugs depending upon the severity of the disease.

Daily improvement was observed to assess the efficacy. The results obtained were found to be propitious. Particularly results by complimentary therapies were found to be very auspicious.

No adverse reactions were found. Hence the trial drug was found to be safe and effective.

From the clinical study it could be inferred that treatment with trail drugs considerably improves the functions of

Viyanan – responsiple for sensory and motor activities and body movement

Abanan – responsible for defaecation, micturation, menstruation and ejaculation

Nagan: responsible for higher intellectual functions and eye ball movement

Dhevathathan – responsible for movements of eye ball, laziness, arguing, begging

Samanan – responsible for normal digestion and correction of other vayus

It could be also inferred that the trial drugs inhibit the further vascular disorders and regulate the other physiological process of the body

Available investigations in modern medicine were also considered for diagnosis and follow the prognosis of the patients.

The efficacy of the trial drugs were studied by bio-chemical analysis and pharmacological analysis.

CONCLUSION

In this clinical study **Vishnu chakra mathirai** – 130 mg twice a day with honey was taken as internal medicine administered to the pakkavatham along with **kodiveli thylam** was taken for external application have good relief.

In the pre clinical study pharmacological evaluation of the trial drug shows

- ❖ Thrombolytic activity and
- ❖ Anti inflammatory activity

In the preclinical study toxicity study of Vishnu chakra mathirai shows that the trial drug had no acute toxicity.

The overall results of efficacy of the trial drugs along with external therapies by declining the clinical signs and symptoms like difficulty in using upper and lower limbs of one side of the body, difficulty in walking

Good clinical improvement was observed in 11(28.94%) patients. Moderate clinical improvement was observed in 15(39.47%) patients. Mild clinical improvement was observed in 12(31.57%) patients.

The trial drug Vishnu chakra mathirai and kodiveli thylam have no adverse effects durin thr treatment period. So the trial medicines are safe and effective

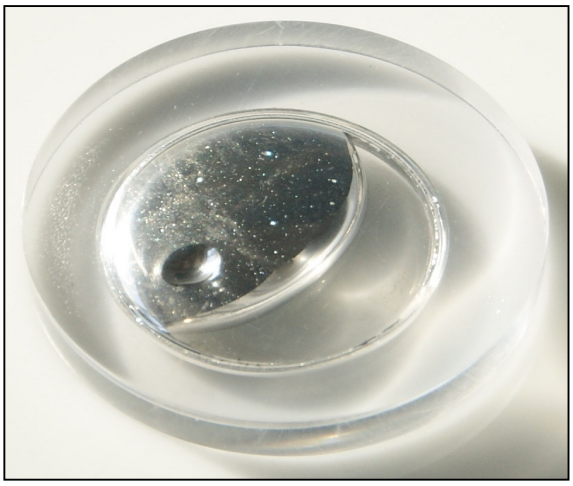
Patients who had undergone massage and varma therapies got good reliefe than the others

Because of engorging result clinically, the study may undertake with a large number of patients with same drug will creat a new era in the field of siddha medicine especially in the treatment of pakkavatham. It may through light on relieving the patient from the clutches of clippling by this disease.

INGREDIENTS OF THE TRIAL DRUG

VISHNU CHAKRA MATHIRAI (INTERNAL MEDICINE)

Lingam



Rasam

Ganthakam

Thalagam

Manosilai

Kantham

Thutham

Naabi

Palagarai

Veppampalam

INGREDIENTS OF THE TRIAL DRUG

KODIVELI THYLAM (EXTERNAL MEDICINE)

Kodiveli

Karunjeeragam

Thalisapathiri

Thandrikai

Pasuvennai

Pasumpal

VISHNU CHAKRA MATHIRAI

(INTERNAL DRUG)

KODIVELI THYLAM

(EXTERNAL DRUG)

ANNEXURES

PREPARATION AND PROPERTIES OF THE TRIAL DRUG

STANDARD OPERATING PROCEDURE FOR PREPARATION OF VISHNU CHAKRA MATHIRAI (Internal) AND KODIVELI THYLAM (External)

TRIAL DRUG :

INTERNAL MEDICINE : "VISHNU CHAKRA MATHIRAI **"**

Ref: *siddha vaithiya thirattu*

SOURCE OF TRIAL MEDICINE:

The required raw drugs for preparation of **"VISHNU CHAKRA MATHIRAI"** (internal) will be purchased from a well reputed country shop and the purchased drugs will be authenticated by the faculty members in charge of Gunapadam laboratory at Government Siddha medical college palayamkottai.

INGREDIENTS:

1. **PURIFIED RASAM** (MERCURY)
2. **PURIFIED LINGAM** (CINNABAR)
3. **PURIFIED GANTHAGAM** (SULPHUR)
4. **PURIFIED THUTHTHAM** (ZINC SULPHAS)
5. **PURIFIED THALAGAM** (TRISULPHURET OF ARSENIC)
6. **PURIFIED KANTHAM** (MAGNETIC OXIDE OF IRON)
7. **PURIFIED MANOSILAI** (RED ORPIMENT)
8. **PURIFIED NAABI** (ACONITUM NAPELLUS.LINN)
9. **PURIFIED PALAGARAI** (COWRY)
10. **NEEM FRUIT JUICE** (AZADIRACTA INDICA)
11. **CHUKKU** (ZINGIBER OFFICINALE)
12. **MILAGU** (PIPER NIGRUM.LINN)
13. **THIPPILI** (PIPER LONGUM)
14. **INJI JUICE** (ZINGIBER OFFICINALE)
15. **THEAN** (HONEY)

All the ingredients completely purified under the methoid of sarakku suththi muraigal literature.

METHOD OF PREPARATION:

The purified ingredients one to nine taken as equal amounts and gently grind with juice of Neem fruit. After the sufficient amount of time to mixture it is prepare as a kuntri (130 mg) size mathirai and dried in dark place.

PROPERTIES OF DRUG – INGREDIENTS:

Internal drug - Vishnu chakara mathirai

1. இலிங்கம்

Tamil name : இலிங்கம்

English name: Cinnabar (or) virmilion

Chemical name: Red sulphide of mercury (natural)

வேறு பெயர்கள்: ஆண்குறி,இராசம்,கடைவன்னி,கர்ப்பம்,அண்டகம்,சமரசம்.

தன்மை: வெப்பம்

பொதுகுணம்:

''பேதிசுரஞ் சந்நி பெருவிரண நீரொடுத
காதகடி காசங் கரப்பான்புண்-ணோத
வுருவிலிங்க சங்கதமா யூறுகட்டி யும்போங்
குருவிலிங்க சங்கமத்தைக் கொள்.''

''ஆதி யிரதவுருக் காதலாற் சாதிலிங்க
மோதி லிரதகுண முற்றுடலிற்-றீதுபுரி
குட்டங் கிரந்தி கொடுங்சூலை வாதமுத
லுட்டங்கு நோய்களையோட் டும்.''

செய்கை: உடற்தேற்றி

தீரும் நோய்கள்: துன்பத்தை உண்டுபண்ணுகின்ற பேதி,சுரம்,சந்நிபாதம்,தீராப்புண்கள், அதிமூத்திரம்,காணாக்கடிவிடம்,காசம் ,கரப்பான் ,சிரங்கு,சொல்வதற்கும் பார்ப்பதற்கும், வெறுப்புத் தோன்றும் பரவு நுணாக்காய்க் கிரந்தி,குட்டம், கிரந்தி, கொடுமை செய்கின்ற சூலை, வாத நோய் முதலியவைகளையும் உடலில் மறைந்து இருக்கும் பிணிகளையும் நீக்கும்.

சுத்தி முறை: பழச்சாறு, பசும்பால், மேனிச்சாறு இம்மூன்றையும் சமவெடை கூட்டி இலிங்கத்திற்குச் சுருக்கிட்டு எடுக்க சுத்தியாகும்.

2.இரசம்

Tamil name: இரசம்

English name: Hydrargyrum

Chemical name: Mercury, Quick silver.

வேறு பெயர்கள்: காரம் , சூதம் , புண்ணியம் , விண்மருந்து, பாரதம் , ஆதி, மகாமரம், இனிமை, சாறு.

சுவை: அறுசுவை

தன்மை: வெப்ப சீத வீரியங்களிரண்டையுமுடையது.

பிரிவு: எப்பொருளை துணைமருந்தாக்கி கொடுக்கின்றோமோ அப்பொருளின் பிரிவை அடையும்.

நிறம்: வெளிப்புறத்து--சூரிய ஒளி நிறம்

உட்புறத்து-சிறிது நீலநிறம்

பொதுக்குணம்:

''விழிநோய் கிரந்திகுன்மம் மெய்ச்சூலை புண்குட்
டழிகாலில் விந்துவினால் அத்தை-வழியாய்
புரியு விதி யாது புரியினோ யெல்லாம்
இரியுவிதி யாது மில்லை''

தீரும்நோய்கள்: கண்நோய், கிரந்தி, எண்வகைக் குன்மம், சூலை, பெரும் புண், தொழுநோய் , வளிக்குறைவு நோய்கள் நீங்கும்.

செய்கை: மலபோக்கி, உரமாக்கி, உடற்றேற்றி, வீக்கமுருக்கி, உமிழ்நீர் பெருக்கி, சிறுநீர்பெருக்கி, மேகநாசினி, பித்தநீர் பெருக்கி.

சுத்தி முறை: இலிங்கத்திலிருந்து எடுக்கபடுகின்ற வாலைரசம் தூய்மையாகவும் சிறந்ததாகவும் கருதப்படுகின்றது.

3.கந்தகம்

Tamil name: கந்தகம்

English name: Sulphur

Chemical name: Sulphur

வேறு பெயர்கள்: காரிழையின் நாதம், பரைவீரியம், பீஜம்,தனம்,பொன்வர்ணி, இரசசுரோணிதம்.

சுவை: கைப்பு, துவர்ப்பு.

பொதுகுணம்:

''நெல்லிக்காய்க் கந்திக்கு நீள்பதினெண் குட்டமந்தம்
வல்லை கவிசைகுன்ம வாயுகண்ணோய் -பொல்லா
விடக்கடிவன் மேகநோய் வீறுசுரம் பேதி
திடக்கிரசு ணீகபம்போந் தேர்''

தீரும்நோய்கள்: பதினெண்குட்டம், மந்தம், கல்லீரல் வீக்கம், பெருவயிறு வகைகளுள் ஒன்றாகிய கவிசை, குன்மவாயு, கண்ணோய்கள் ,கொடுமையைச் செய்கின்ற விடக்கடிகள் நாட்பட்ட மேக நோய்கள், வாத சுரம், பேதி, நாட்பட்ட கிரகணி, கபம் முதலியன நீங்கும்.

செய்கை: பித்தநீரை அதிகபடுத்தும், உடற்றேற்றி, வியர்வைபெருக்கி, கிருமிநாசினி, மலமிளக்கி. அகங்களின் சளிச்சவ்வு சுரப்பை அதிகபடுத்தும்.

வெளிப்படுதல் : வியர்வை, பால் , சிறுநீர்.

சுத்தி முறை: வாழைக்கட்டை நீரில் கெந்தியை 10 முறை உருக்கி உருக்கி சாய்தெடுக்கச் சுத்தியாகும்.

4.தாளகம்

Tamil name: தாளகம்

English name: Orpiment/yellow arsenic Trisulphide

Chemical name: Trisulphide of arsenic

வேறு பெயர்கள்: பீதகி, பிஞ்சனம் , ஆலம்பி, மாலம் , கால்புத்தி.

பொதுக்குணம்:

''தாளகத்தின் பேருரைக்கத் தாலுகவுள் நோய்குஷ்டம்
நீளக் குளிர்காய்ச்சல் நீடுகபம் -நாளகங்கொள்
துஷ்டப் பறங்கிப்புண் சூழழுகண் மண்டைநோய்
கிட்டப் படுபமா கிளத்து.''

தீரும்நோய்கள்: நாக்கு, கபோலம், இவைகளைப் பற்றிய நோய் , குட்டம் , குளிர்சுரம் , கபம் மூத்திர நாளத்தைப் பற்றிய பறங்கிப்புண் , அழுகண் , மண்டைநோய் முதலியவை நீங்கும்.

செய்கை: கோழையகற்றி, உரமாக்கி, உடற்றேற்றி, வாந்தியுண்டாக்கி, நச்சரி, சுரமகற்றி.

சுத்தி முறை: சுண்ணாம்புக் கல்லின் இடையில் வைத்துப் பனங்கள்ளினால் 10 தரத்துக்கு குறையாமல் தாளித்து எடுத்து, கழுவி உலர்த்திக் கொள்ள சுத்தியாகும்.

5.மனோசிலை

Tamil name: மனோசிலை

English name: Red orpiment (or) Realgar

Chemical name: Arsenic Disulphidum

வேறு பெயர்கள்:நான்முகன், தேனி, சரசோதி, தாமரைவாசினி, வாணிவெள்ளச்சி.

வைப்பு: 5% வெள்ளைப்பாடாணமும்+3% கந்தகமும்

பொதுக்குணம்:

''கொடிய குஷ்டம் காய்ச்சல் நடுக்கலஜ கல்லிரைப்
புச்சிலந்திப் பேசறும னோசிலைக்குப் பேசு.''

தீரும்நோய்கள்: சரும குட்டம், நளிர் சுரம், அஜகல்லிகாரோகம், இரைப்பு (சுவாசம்), சிலந்திவிடம் முதலியன போம்.

சுத்தி முறை: இஞ்சிச்சாற்றில் ஒருசாமம் ஒன்றாய் அரைத்து, உலர்த்தி எடுக்கச் சுத்தியாகும்.

6.காந்தம்

Tamil name: காந்தம்

English name: Magnet.

Chemical name: Magnetic oxide of iron.

வேறு பெயர்கள்: சிவலோகச் சேவகன், சூத அங்குசம் ,நவலோக துரட்டி, முருகன் புராணம்

பொதுக்குணம்:

காந்தத்தாற் சோபைகுன்மங் காமிலமே கம்பாண்டு
சேர்ந்ததிரி தோடவெட்டை சீதங்கால்-ஓய்ந்தபசி
பேருதரங் கண்ணோய் பிரமியநீ ராமையும்போம்
ஓரினிறை யாயுளுறும் உன்

செய்கை: உடற்றேற்றி

சுத்தி முறை: எலுமிச்சைபழச்சாறு, புளித்த காடி, புளித்த மோர், இவைகளில் முறையே மும்முன்று நாள் ஊறவைத்து வெயிலில் வைத்துக் கழுவி எடுக்கச் சுத்தியாகும்.

7.துத்தம்

Tamil name: பால் துத்தம்

English name: Zinc sulphas

Chemical name:Sulphate of zinc

வேறு பெயர்கள்: வெள்ளைதுத்தம் ,மடல் துத்தம், நாக உப்பு, வெள்ளிய உப்பு.

பொதுக்குணம்:

'' முற்றிய குறிப்புண் முறைவிரணஞ் சென்னிதனைப்
பற்றிநின்ற வாதம் படர்கரப்பான் -சுத்தவிழிக்
காசங் கணம்பில்லங் கண்ணோய்குந் தந்தொலையும்
வாசமிகு துத்தத்தால் வாழ்த்து.''

தீரும்நோய்கள்: குறிகளிலுண்டாம் புண், மூளைகளிலுள்ள புண்கள் , தலையைப் பற்றிய வாதநோய், படர்கின்ற கரப்பான், கண் காசம், குழந்தைகளுக்குக்காணும் கணம், இமையிலுண்டாம் பில்லம், கண்ணோய், குந்தம் முதலிய பிணிகள் துத்தத்தினால் நீங்கும்.

செய்கை: உரமாக்கி, இசிவகற்றி, வாந்தியுண்டாக்கி.

சுத்தி முறை: பசுவின் நீரில் வைத்தெரித்துக் கழுவியெடுத்து வெய்யிலில் உலர்த்தி கொள்ளச் சுத்தியாகும்.

8.நாபி

Tamil name: நாபி

English name: Aconitum napellus

Family name: Ranunculaceae

வேறு பெயர்கள்: நாபம் , விடம் ,மருதம்.

பயன்படும் உறுப்பு : Rhizome

சுவை: கைப்பு

தன்மை: வெப்பம்

பிரிவு:கார்ப்பு

பொதுக்குணம்:

வாதவலி மந்தமறல் மாறாக் கபப்பிணிகள்
ஓதுகுட்டு குன்மந்தேள் ஓடுங்காண் - காதலர்தம்
புத்தியோ டாருயிரும் பூவும் வனைகுழலே!
சுத்திசெய்த நாவியின்பேர் சொல்.

தீரும் நோய்கள்: கீழ்வாய்க் கடுப்பு, செரியாமை, ஐயப்பிணிகள், பெருநோய், குன்மம், தேள் நஞ்சு போம்.

செய்கை: வியர்வைபெருக்க்கி, சிறுநீர்பெருக்கி, முறைவெப்பகற்றி, தாதுவெப்பகற்றி, மூர்ச்சையுண்டாக்கி, துயரடக்கி.

சுத்தி முறை: எலுமிச்சம் பழச்சாறு, புளித்தகாடி, புளித்தமோர் இவைகளில் முறையே மும்மூன்று நாள் கந்தகத்தை ஊறவைத்து வெயிலில் வைத்துக் கழுவி எடுக்கச் சுத்தியாகும்.

Chemical Constituents: Aconitine, mesaconitine, hypaconitine and jesaconitine.

9.பலகறை

Tamil name: பலகறை

English name: Marine shell, Cowry

Zoological name: Cypraea moneta linn.

வேறு பெயர்கள்: கவடி, சோகி, வராடி.

சுவை: கைப்பு

பொதுக்குணம்:

''மந்தந்தா கங்கிரகணி மாவிடச் சுரங்கண்ணோய்
தொந்தம் பரிநாமச் சூலைகய –மிந்த
வுலகறையை காலொடிவை யோடு நரைத்த
பலகறையை காணினியம் பார்''.

தீரும்நோய்கள்: வெண் பலகறையினால் அலசம், தாகம், கிரகணி, விடச்சுரங்கள், விழிநோய், வாத தொந்தம், பலவிதக் குத்தல், கயம், கபவாதம், அஜீரணம், காமாலை, கல்லீரல், மண்ணீரல் வீக்கம், சுவாசகாசம், காசம் தீரும்.

செய்கை: வெப்பமுண்டாக்கி, கோழையகற்றி, தாதுவெப்பகற்றி, வெளிப்பிரயோகத்தில் தடிப்புண்டாக்கி.

சுத்தி முறை: பசுவின் நீரில் வைத்துக் கழுவியெடுத்து, வெய்யிலில் உலர்த்திக் கொள்ளச் சுத்தியாகும்.

EXTERNAL MEDICINE:

KODIVELI THYLAM

- Ref: Gunapadam mooligai

INGREDIENTS:

1. **KODIVELI ROOT (**PLUMBAGO INDICA) – 35 grms
2. **KARUNJEERAGAM (**NIGELLA SATIVA) **-** 35 grms
3. **THALISAPATHIRI (**ABIES SPECTABILIS) **-** 35 grms
4. **THANTRIKKAI (**TERMINALIA BELLIRICA)**-** 35 grms
5. **GINGLY OIL** (SESAMUM INDICUM)**– ½** padi
6. **PASU VEENNAI –** punnai kai alavu
7. **COW MILK**

METHOD OF PREPARATION:

Add Kodiveli root with four times of water and boiled until the water reduced to half padi decoction. Then second to fourth ingredients grind with cow milk and added into the above decoction. gingly oil and pasu vennai added with above combination and boiled by thylam preparation method.

1. கொடிவேலி

வேறுபெயர்கள்: வெண்சித்திரமூலம், வெண்கொடிமூலம்.

Botanical name: Plumbago zeylanica.

Family name: plumbaginaceae.

English name: Ceylon lead- wort

Part used: Root , Root bark.

சுவை: கார்ப்பு, விறுவிறுப்பு

தன்மை: வெப்பம்

பிரிவு: கார்ப்பு

பொதுக்குணம்:

கட்டிவிர ணங்கிரந்தி கால்கள் அரையாப்புக்
கட்டிச்சூ லைவீக்கங் காழ்மூலம் -முட்டிரத்தக்
கட்டுநீ ரேற்றங் கனத்த பெருவயிறும்
அட்டுங் கொடிவேலி யாம்.

தீரும்நோய்கள்:கட்டி, புண், கழலை, வளிநோய், அரையப்புக்கட்டி, குத்தல், சோபை, மூலரோகம், உதிரகட்டு, நீரேற்றம், பெருவயிறு போம்.

செய்கை: முறைவெப்பகற்றி, வியர்வையுண்டாக்கி.

Chemical Constituents: plumbagin, isoshinanolone , plumbagic acid, beta-sitosterol, 4-hydroxybenzaldehyde, trans-cinnamic acid, vanillic acid, 2, 5-dimethyl-7-hydroxychromone, indole-3-carboxaldehyde .

2. கருஞ்சீரகம்

வேறுபெயர்கள்: அரணம் , உபகுஞ்சிகை.

Botanical name: Nigella sativa.

Family name: Ranunculaceae

English name: Black cumin

Part used: Seed

சுவை: கைப்பு

தன்மை: வெப்பம்

பிரிவு: கார்ப்பு

பொதுக்குணம்:

கருஞ்சீ ரகந்தான் கரப்பனொடு புண்ணும்
வருஞ்சிராய்ப் பீநசமு மாற்றும்-அருந்தினால்
காய்ச்சல் தலைவலியுங் கண்வலியும் போமுலகில்
வாய்ச்ச மருந்தெனவே வை.

தீரும் நோய்கள்: மண்டை கரப்பான் , புண் ,உட்சூடு, தலை நோய் ,கண்ணோய், சிரங்கு, வயிற்றுப் பொருமல் , குன்மம் , மார்புவலி, இருமல் , வாந்தி, ஓக்காளம் , காமாலை ஆகியவை தீரும்.

செய்கை: சிறுநீர்பெருக்கி, ருதுவுண்டாக்கி, பாற்பெருக்கி, பசித்தீத்தூண்டி, தூக்குணிபுழுக்கொல்லி, வறட்சியகற்றி.

Chemical Constituents: Cuminaldehyde, cymene, terpenoids, essential oil.

3. தாளிசபத்திரி

Botanical name: Abies spectabilis

Family name: Pinaceae

English name: Flaurtia calapharacta

Part used: Leaf

சுவை: கார்ப்பு

தன்மை: வெப்பம

பிரிவு: கார்ப்பு

பொதுக்குணம்:

நாசி களப்பிணிகள் நாட்பட்ட -காசஞ்சு
வாசம் அருசி வனமங்கால் -வீசிவரு
மேகமந்தம் அத்திசுரம் விட்டேகுந் தாளிச்சத்தால்
ஆகுஞ் சுகப்பிரச வம்.

தீரும் நோய்கள்: கழிச்சல் , சுரம் , நாட்பட்ட இருமல் , இரைப்பு, வாந்தி, வாய்வு, அசீரணம் , அத்திசுரம் தீரும். இதனால் சுகப்பிரசவம் உண்டாகும்.

செய்கை: பசித்தீத்தூண்டி, அகட்டுவாய்வகற்றி, கோழையகற்றி, உரமாக்கி.

4. தான்றிக்காய்

வேறுபெயர்கள்: அகஷம், அமுதம், எரிகட்பலம், கந்துகன், சகதம், விபீதகம் .

Botanical name: Terminalia bellirica

Family name: Combretaceae

English name: Beleric myrobalans

Part used: Seed

சுவை: துவர்ப்பு

தன்மை: வெப்பம்

பிரிவு: இனிப்பு

பொதுக்குணம்:

சிலந்திவிடம் காமியப்புண் சீழான மேகங்
கலந்துவரும் வாதபத்தங் காலோ-டலர்ந்துடலில்
ஊன்றிக்காய் வெப்ப முதிரபித் துங்கரக்குந்
தான்றிக்காய் கையிலெடுத் தால்
ஆணிப்பொன் மேனிக் கழகும் ஒளியுமிகும்
கோணிக்கொள் வாதபித்தக் கொள்கைபோம்-தானிக்காய்
கொண்டவர்க்கு மேகமறும் கூறா அனற்றிணயும்
கண்டவர்க்கு வாதம்போம் காண்

தீரும் நோய்கள்: சிலந்திநஞ்சு, ஆண்குறிப்புண் , வெள்ளை, குருதியழல்நோய் , வளி தீ குற்றங்களால் வரும் நோய்கள் போம்.உடற்கு அழகையும் ஒளியையும் கொடுத்து முக்குற்றங்களையும் தன்னிலைப்படுத்தும்.

செய்கை: துவர்ப்பி, கோழையகற்றி, மலமிளக்கி, உரமாக்கி

Chemical Constituents: Beta-sitosterol, gallic acid, ellagic acid, ethyl gallate, galloyl glucose, chebulagic acid,Tanin.

DRUG STORAGE:

The trial drug **"VISHNU CHAKRA MATHIRAI"** is stored in clean and dry glass bottles. **"KODIVELI THYLUM"** is stored in dry, clean and narrow mouthed bottles.

DISPENSING:

The "MATHIRAI" is to be dispensed in dry, plastic container and the "OIL" is to be given in disposable pet bottles.

ANNEXURES -II

QUALITATIVE AND QUANTITATIVE ANALYSIS

BIO-CHEMICAL ANALYSIS OF VISHNU CHAKRA MATHIRAI

(IN POWDER FORM)

Preparation of the extract:

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

QUALITATIVE ANALYSIS

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	**TEST FOR CALCIUM** 2ml of the above prepared extract is taken in a clean test tube. To this add 2ml of 4% Ammonium oxalate solution.	A white precipitate is formed.	**Indicates the presence of calcium.**
2.	**TEST FOR SULPHATE** 2ml of the extract is added to 5% Barium chloride solution.	No white precipitate is formed.	Absence of sulphate.
3.	**TEST FOR CHLORIDE** The extract is treated with silver nitrate solution.	No white precipitate is formed.	Absence of chloride**.**
4.	**TEST FOR CARBONATE** The substance is treated with concentrated HCL.	No Brisk effervescence is formed	Absence of carbonate
5.	**TEST FOR STARCH** The extract is added with weak iodine solution.	No Blue colour is formed.	Absence of starch.
6.	**TEST FOR FERRIC IRON** The extract is acidified with Glacial acetic acid and potassium ferro cyanide.	No blue colour is formed.	Absence of ferric iron.
7.	**TEST OF FERROUS IRON** The extract is treated with concentrated Nitric acid and Ammonium thio cyanide solution.	Blood red colour is formed.	**Indicates the presence of ferrous iron.**

8.	**TEST FOR PHOSPHATE** The extract is treated with Ammonium Molybdate and concentrated nitric acid.	No yellow precipitate is formed.	Absence of phosphate.
9.	**TEST FOR ALBUMIN** The extract is treated with Esbach's reagent.	No Yellow precipitate is formed.	Absence of Albumin.
10.	**TEST FOR TANNIC ACID** The extract is treated with ferric chloride.	No Blue black precipitate is formed.	Absence of tannic acid.
11.	**TEST FOR UNSATURATION** Potassium permanganate solution is added to the extract.	It gets decolourised.	**Indicates the presence of unsaturated compound.**
12.	**TEST FOR THE REDUCING SUGAR** 5ml of Benedict's qualitative solution is taken in a test tube and allowed to boil for 2 mts and add 8-10 drops of the extract and again boil it for 2 minutes.	No colour change occurs.	Absence of reducing sugars
13.	**TEST FOR AMINO ACID;** One or two drops of the extract is placed on a filter paper and dried well. After drying, 1% Ninhydrin is sprayed over the same and dried it well.	Violet colour is formed.	**Indicates the presence of Amino acid.**
14.	**TEST FOR ZINC;** The extract is treated with Potassium Ferrocyanide.	No white precipitate is formed	Absence of Zinc.
15.	**TEST FOR MERCURY;** The extract is treated with Ammonia and boil(till the ammonia caeses off) then add potassium Iodide	No scarlet precepetate is formed	Absence of Mercury

Inference:

The given sample of "VISHNU CHAKRA MATHIRAI" contains Calcium, Chloride, Ferrous iron, Unsaturated compound, Amino acid.

ANNEXURE - III

PHARMACOLOGICAL ANALYSIS

EFFECT OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON CARRAGEENAN-INDUCED LOCALISED INFLAMMATORY PAIN IN RATS

SUMMARY

The study plan was developed based on the guidelines of Vogel[1] and also it has reference to Chao Ma and Jun-Ming Zhang[2] and Walker et al. [3,] Winter CA, Risley EA, Nuss GW. Carrageenin induced edema in hind paw of the rat as an assay for anti-inflammatory drugs. Proc Soc Exp Biol Med. 1962;111:544–7.

Objective

To study the anti-inflammatory effect of **VISHNU CHAKRA MATHIRAI** were prepared **WITH INJI JUICE AND HONEY** in the rat model of Carrageenan-induced localized inflammation.

Methods:

Test System

Species	:	Rat
Strain	:	Albino Wister
Age	:	6-8 weeks at the time of dosing
Total no. of Rats	:	24
Sex	:	Male
Weight	:	150 gm

The animals were housed in polypropylene cages with stainless steel top grills having facilities for holding pellet food and drinking water in bottle with stainless steel sipper tube. Each cage contained 6 rats. All rats had free access to potable water and standard pelleted laboratory animal diet *ad libitum*. Paddy husk was used as bedding material. The animals were divided into 5 groups (6 rats/group). Localized inflammatory pain was induced in all groups of animals by intraplantar injection of carrageenan (50 µl of 3% suspension).

One day before the experiment, three basal readings of hind paw in each rat were recorded. Group 1 received vehicle orally, Group 2 received a standard drug Diclofenac sodium (10 mg/kg i.p), whereas groups 3,4and 5 received **VISHNU CHAKRA MATHIRAI**. The doses of **VISHNU CHAKRA MATHIRAI** were prepared **WITH INJI JUICE AND**

HONEY, whereas Diclofenac sodium was dissolved in normal saline. After 30 min, the rats were challenged with subcutaneous injection of 0.1 ml of 1% w/v solution of carrageenan into the sub plantar region of left paw. The paw was marked with ink at the level of lateral malleolus and immersed in mercury up to the mark. The paw volume was measured at 0, 1, 2, 3, 4, 5 and 6^{th} hr after carrageenin injection using Digital Plethysmometer. The difference between initial and subsequent reading gave the actual edema volume.

CONVERSION FORMULA:

Human dose is 130 mg /kg day

Total clinical dose (a) x conversion factor (b) 0.018 = (c) per 150 gm of Rat

130 mg x 2(a) x 0.018 (b) = 2.34 (c) /150 gm of Rat

2.34/1000x150 = 0.351 mg /kg/rat

Experimental Doses Calculated as per the standard procedures are

S.No	Groups	Dose /kg, weight	Volume of administration
1	Vehicle Control	**INJI JUICE AND HONEY**	1 ml
2	Therapeutic Dose	0.351 mg /kg	1 ml
3	Middle Dose	1.755mg/kg	1 ml
4	High Dose	8.775mg/kg	1 ml

EXPERIMENTAL DESIGN:

Group-I: Served as a negative control (0.1ml of 1% carrageenin)

Group-II: Served as standard received Diclofenac sodium (10mg/kg, i.p) +

(0.1ml of 1% carrageenin)

Group-III: Received **VISHNU CHAKRA MATHIRAI** were prepared **WITH INJI JUICE AND HONEY**

(0.351 mg /kg) + (0.1ml of 1% carrageenin)

Group IV: Received **VISHNU CHAKRA MATHIRAI** were prepared **WITH INJI JUICE AND HONEY**

(1.755mg/kg) + (0.1ml of 1% carrageenin)

Group V: Received **VISHNU CHAKRA MATHIRAI** were prepared **WITH INJI JUICE AND HONEY**

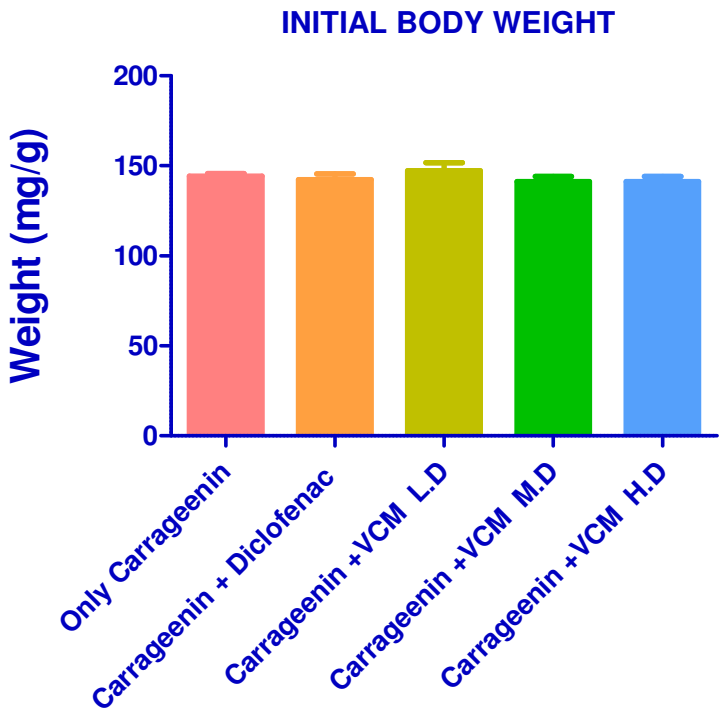
(8.755mg/kg) + (0.1ml of 1% carrageenin)

TABLE: EFFECT OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON Carrageenin -INDUCED PAW EDEMA IN RATS

(BODY WEIGHT in gms)

Group	Control	carrageenan + Standard	carrageenan + VCM LD	carrageenan + VCM M D	carrageenan + VCM H D
INITIAL BODY WEIGHT	144.3±1.453	142.3±3.18	147.3±4.372	141.3±2.667	141.3±2.728

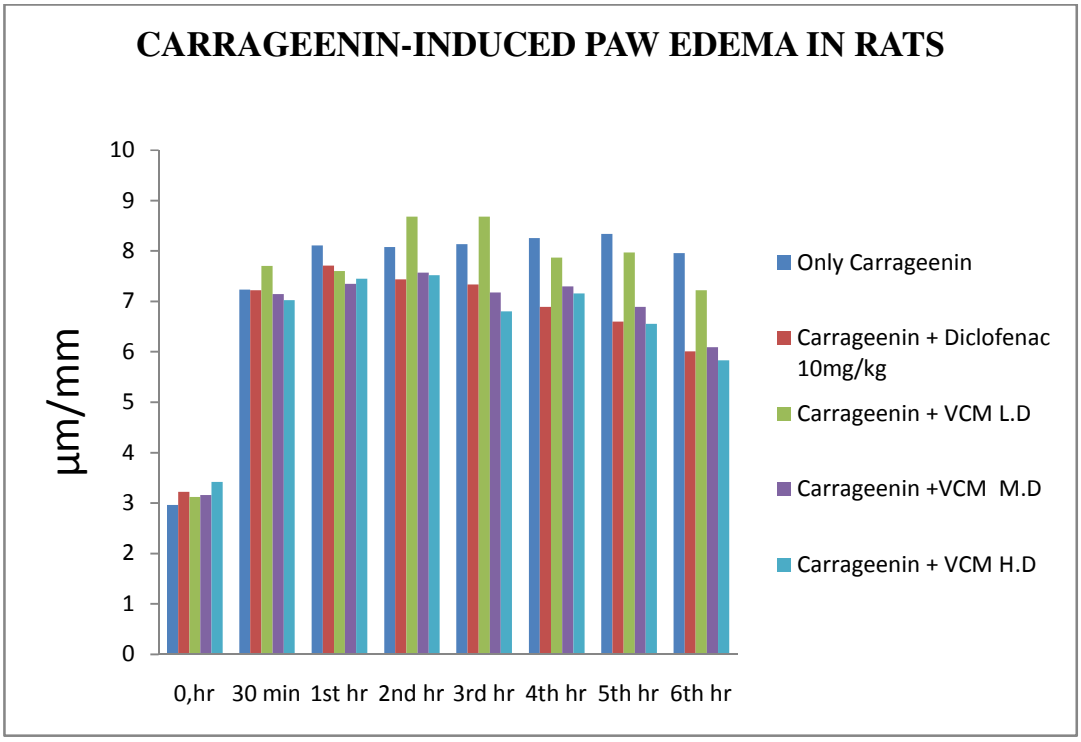
Values are expressed as the mean ± S.D. Statistical significance (p) calculated by one way ANOVA followed by dunnett's. ns- not significant $^{**}P< 0.05$ calculated by comparing treated group with control group.



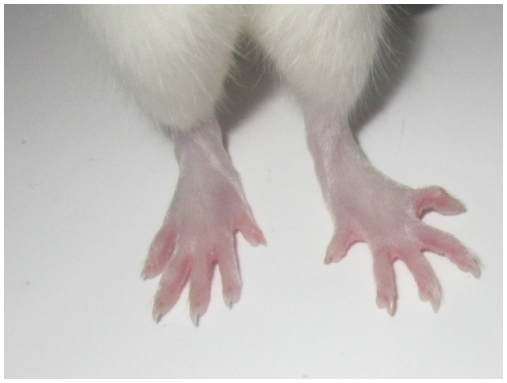
EFFECT OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON Carrageenin -INDUCED PAW EDEMA IN RATS

Group	Mean paw volume before carrageenan injection	Paw Volume after induction with carrageenin Increase in paw volume (ml) after carrageenan injection (mean ± SEM)/Percent inhibition of edema						
	0 min	30 min	1h	2h	3h	4h	5h	6h
Control	2.967± 0.2437	7.24± 0.4997	8.11± 0.2775	8.087± 0.1683	8.147± 0.2439	8.26± 0.2212	8.347± 0.1162	7.963± 0.1978
Standard	3.223± 0.1934	7.227± 0.4068	7.71± 0.1253	7.44± 0.2274	7.343± 0.09207*	6.893± 0.04667**	6.607± 0.1397**	6.013± 0.4917**
carrageenan +VCM LD	3.123± 0.2739	7.707± 0.6244	7.603± 0.1586	8.687± 0.2285	8.683± 0.1641	7.873± 0.2367	7.973± 0.07424	7.22± 0.1692
carrageenan +VCM M D	3.163± 0.0928	7.153± 0.2743	7.353± 0.07055	7.577± 0.2843	7.187± 0.03333**	7.3± 0.1908*	6.893± 0.4939*	6.09± 0.3256**
carrageenan + VCM H D	3.423± 0.277	7.027± 0.1179	7.453± 0.2544	7.52± 0.1804	6.807± 0.1298***	7.16± 0.2013**	33.23± 27.05**	5.833± 0.2987**

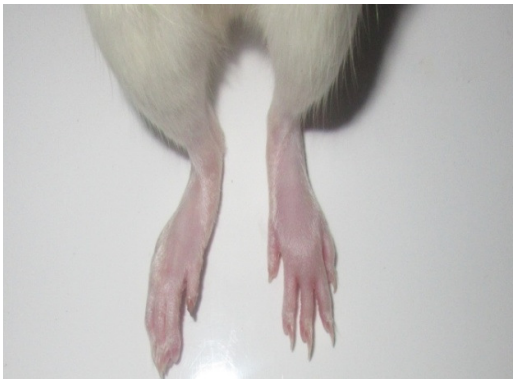
Values are expressed as the mean ± S.D. Statistical significance (p) calculated by one way ANOVA followed by dunnett's. ns- not significant $^{**}P<$ 0.05 calculated by comparing treated group with control group.


CARRAGEENIN-INDUCED PAW EDEMA IN RATS
µm/mm
10
9
8
7
6
5
4
3
2
1
0
0,hr
30 min
1st hr
2nd hr
3rd hr
4th hr
5th hr
6th hr
Only Carrageenin
Carrageenin + Diclofenac 10mg/kg
Carrageenin + VCM L.D
Carrageenin +VCM M.D
Carrageenin + VCM H.D

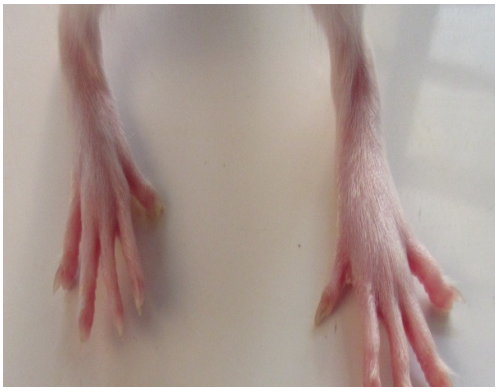
EFFECT OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON Carrageenin -INDUCED PAW EDEMA IN RATS



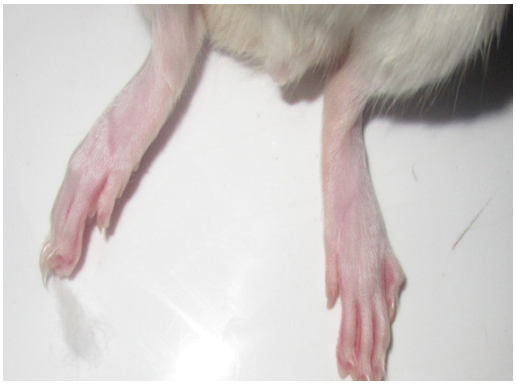
Only Carrageenin



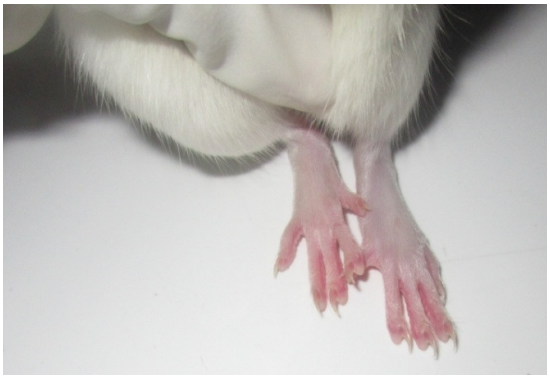
Carrageenin+ STD



Carrageenin + L.D



Carrageenin + M.D



Carrageenin + M.D

EVALUATION OF THROMBOLYTIC EFFECTS OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY IN THE CARRAGEENAN-INDUCED RAT TAIL THROMBOSIS MODEL

EXPERIMENTAL ANIMALS:

Male Albino rats were procured from Bangalore and were housed in microloan boxes in a controlled hygienic environment at temperature 25 ± 2°C and 12 hr dark/light cycle. The study was conducted after obtaining institutional animal ethical committee's clearance (IAEC No: ----). As per the standard practice, the rats were segregated and quarantined for 15 days before the commencement of the experiment. They were fed on standard healthy diet and water *ad libitium.* The acute toxicity studies carried out confirmed that the **VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY** are not toxic even at the concentration of 6000 mg/kg.

Grouping of animals:

The rats were divided into five groups with six rats in each. The groupings are as follows:

Groups	Description	Drug Dose
I	Control	-
II	κ – carrageenan only	-
III	κ – carrageenan +Streptokinase inj	30,000 IU
IV	κ – carrageenan + VCM	0.35 mg/kg
V	κ – carrageenan + VCM	1.75 mg/kg
VI	κ – carrageenan + VCM	8.77 mg/kg

THROMBUS INDUCTION:

Rats with tail length more than 15 cm were chosen for the study. Experimental rats were anaesthetized with i.p injection of ketamine hydrochloride (100 mg/kg). To attain effective clot formation κ – carrageenan (1 mg/kg) dissolved in saline was injected into the rat tail vein at a site 12 cm from the tip of the tail with a ligation. After a period of 10 minutes, the ligature was removed. The length of the infarct was monitored for thrombus formation. Once thrombus was formed, the animals were treated with respective extracts and monitored for the reduction in the length of the thrombus in rat tail for 10 days.[1]

1. Kishore K: In vitro and in vivo screening methods for antithrombotic agents. American Journal of Phytomedicine and Clinical Therapeutics 2013; 1(5): 497-506.

At the end of the study, the rats were sacrificed after an overnight fasting. The blood of the animals was collected by heart puncture and the serum separated was used for the estimation of haematological parameters associated with thrombolysis.

Estimation of bleeding time and clotting time:

At the end of the period, bleeding time was determined for each animal using Duke's method while clotting time was determined by Ivy's method as reported by Ibu and Adeniyi [2]. For bleeding time, the tip of the tail of each rat was cut to cause bleeding. A stopwatch was started as soon as animal began to bleed. A blotting paper was used to wipe off blood every 15 seconds. As soon as bleeding ceased the stopwatch was stopped and the time recorded as bleeding time for that particular animal. For the clotting time, a drop of blood from the tail of each rat was placed on a clean glass slide and a stopwatch was started at the same time. A pin was passed across the drop of blood once every 15 seconds. As soon as threads of fibrin were noticed, the stopwatch was stopped and the time recorded as the clotting time for that particular rat.

2. Ibu JO and Adeniyi KO: A Manual of Practical Physiology, Published by Jos University Press, Jos. 1989; 126.

TABLE 1: INFARCT LENGTH FORMED AND LYSED BY VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY

Group	Treatments	Tail length (cm)	Infarct tail length (cm)	
			Before lysis	Before lysis
I	Control	15.0	NA	NA
II	κ – Carrageenan	15.6	15.4	NA
III	κ - Carrageenan + Streptokinase	15.2	14.8	4.6
IV	κ – Carrageenan + VCM	15.5	15.1	12.7
V	κ – Carrageenan + VCM	15.0	14.2	8.9
VI	κ – Carrageenan + VCM	15.1	14.5	6.5

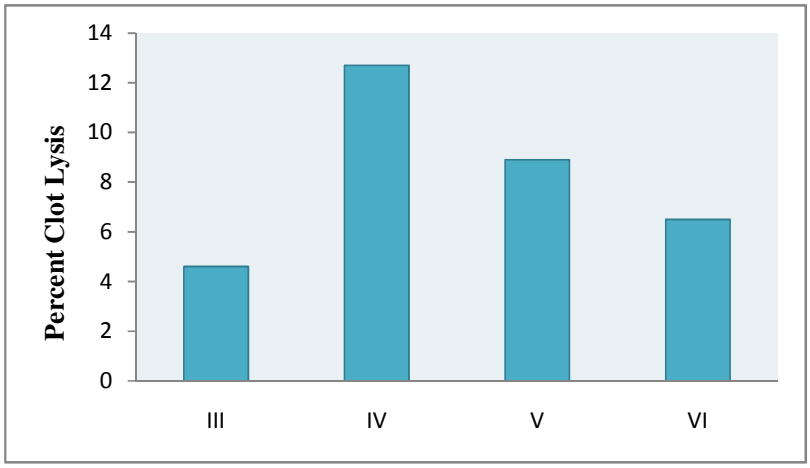


FIG. 1: PERCENT CLOT LYSIS BY IN EXPERIMENTAL RATS

Group III – Streptokinase treated Group IV – VCM L.D Group V – VCM M.D Group VI – VCM H.D

TABLE 2: COAGULATION TIME PARAMETERS IN EXPERIMENTAL RATS

Group	Treatments	Bleeding time	Clotting time
I	Control	9 min 35 s	5 min 20 s
II	κ – Carrageenan	6 min 50 s	3 min 35 s
III	κ - Carrageenan + Streptokinase	19 min 25 s	8 min 30 s
IV	κ – Carrageenan + VCM L.D	10 min 30 s	4 min 45 s
V	κ – Carrageenan + VCM M.D	12 min 25 s	5 min 55 s
VI	κ – Carrageenan + VCM H.D	15 min 35 s	7 min 36 s
	Normal values	3 to 10 min	2 to 5 min

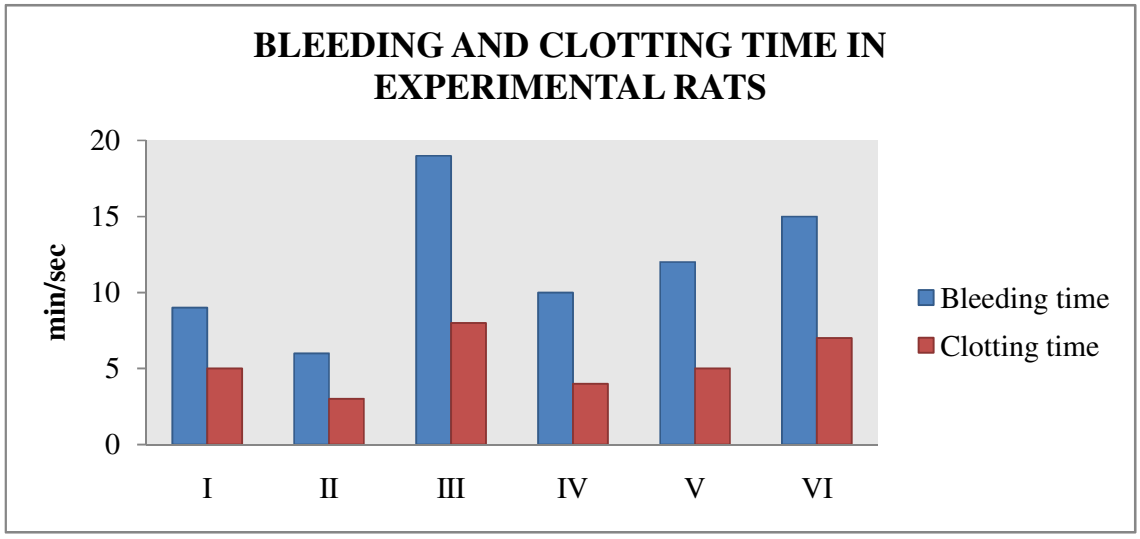
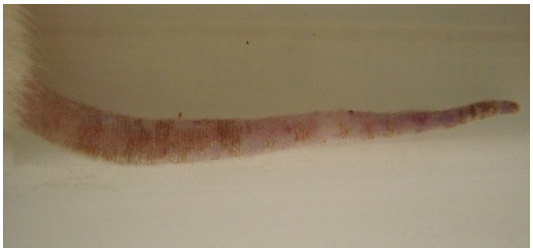
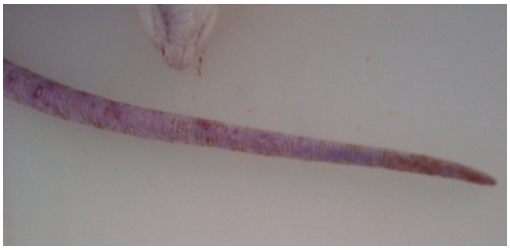


FIG. 2: COAGULATION TIME PARAMETERS IN EXPERIMENTAL RATS

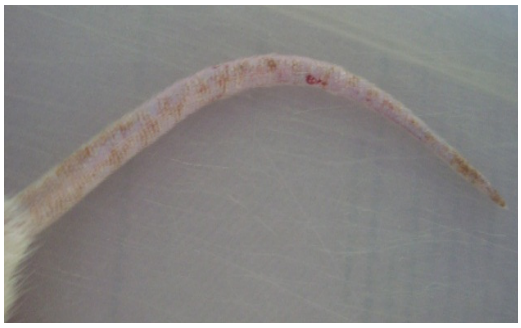
VISUAL MANIFESTATION OF THROMBUS



CONTROL



ONLY CARRAGEENAN



CARRAGEENAN + STD

CARRAGEENAN + VCM L.D

CARRAGEENAN + VCM M.D

CARRAGEENAN + VCM H.D

ANNEXURE – IV

ACUTE TOXICITY STUDY IN FEMALE WISTER RATS TO EVALUATE TOXICITY PROFILE OF CHAKRA MATHIRAI WITH INJI JUICE AND HONEY

Table 1. Test substance details

Name of the test substance	**CHAKRA MATHIRAI WITH INJI JUICE AND HONEY**
Colour of the test substance	BLACK
Nature of the test substance	Powder

Table 2. Experimental protocol

Name of the study	Acute toxicity
Guideline followed	OECD 423 method-acute toxic class method
Animals	Healthy young adult female wister rats, nulliparous, non-pregnant
Body weight	150-200 g
Sex	female
Administration of dose and volume	2000 mg/kg in 200g body weight, single dose in 1 ml
Number of groups and animals	5 groups and 3 animals in each group 100mg,250mg,500mg,1000mgand 2000mg/kg
Route of administration	Oral Cavage (po)
Vehicle	**INJI JUICE AND HONEY**

Table3. Housing and feeding conditions

Room temperature	22°C ± 3°C
Humidity	40-60%
Light	12 h : 12h (light : dark cycle)
Feed	Standard laboratory animal food pellets with water *ad libitum*

Table 4. Study period and observation parameters

Initial once observation	First 30 minutes and periodically 24 h
Special attention	First 1-4 h after drug administration
Long term observation	Upto 14 days
Direct observation parameters	Tremors, convulsions, salivation, diarrhea, lethargy, sleep and coma.
Additional observation parameters	Skin and fur, eyes and mucous membrane, respiratory, circulatory, autonomic and central nervous systems, somato motor activity and behavior pattern etc.

The time of death, if any, is recorded. (Complete observations: annexure I). After administration of the drug, food is withheld for a further 1-2 hours.

Study procedure

Acute oral toxicity was performed as per organization for economic co-operation for development (OECD) guideline 423 method. The **CHAKRA MATHIRAI WITH INJI JUICE AND HONEY** was administered in a single dose by tuberculin syringe. Animals are fasted 3 h prior to dosing (food was withheld for 3 h but not water). Following the period of fasting animals was weighed and test substance was administered orally at a dose of 100mg,250mg,500mg,1000mgand 2000mg/kg. After the **CHAKRA MATHIRAI WITH INJI JUICE AND HONEY** administration, food was withheld 2 h in mice. Animals are observed individually after at least once during the first 30 minutes, periodically during the first 24 hrs, with special attention given during the first 4 hrs, and daily thereafter, for a total of 14 days.

REPORT

Toxicological evaluation of CHAKRA MATHIRAI WITH INJI JUICE AND HONEY

Table:5 Effect of **CHAKRA MATHIRAI WITH INJI JUICE AND HONEY** on acute toxicity test in female rats.

S.N	Response	Head		Body		Tail	
		Before	After	Before	After	Before	After
1	Alertness	Normal	Normal	Normal	Normal	Normal	Normal
2	Grooming	Absent	Absent	Absent	Absent	Absent	Absent
3	Touch response	Absent	Absent	Absent	Absent	Absent	Absent
4	Torch response	Normal	Normal	Normal	Normal	Normal	Normal
5	Pain response	Normal	Normal	Normal	Normal	Normal	Normal
6	Tremors	Absent	Absent	Absent	Absent	Absent	Absent
7	Convulsion	Absent	Absent	Absent	Absent	Absent	Absent
8	Righting reflux	Normal	Normal	Normal	Normal	Normal	Normal
9	Gripping strength	Normal	Normal	Normal	Normal	Normal	Normal
10	Pinna reflux	Present	Present	Present	Present	Present	Present
11	Corneal reflux	Present	Present	Present	Present	Present	Present
12	Writhing	Absent	Absent	Absent	Absent	Absent	Absent
13	Pupils	Normal	Normal	Normal	Normal	Normal	Normal
14	Urination	Normal	Normal	Normal	Normal	Normal	Normal
15	Salivation	Normal	Normal	Normal	Normal	Normal	Normal
16	Skin colour	Normal	Normal	Normal	Normal	Normal	Normal
17	Lacrimation	Normal	Normal	Normal	Normal	Normal	Normal

RESULT:

From acute toxicity study it was observed that the administration of **CHAKRA MATHIRAI WITH INJI JUICE AND HONEY** to Female Wister rats did not induce drug-related toxicity and mortality in the animals up to 2000mg/kg in 200g female Wister rats. So No-Observed-Adverse-Effect- Level (NOAEL) of **CHAKRA MATHIRAI WITH INJI JUICE AND HONEY** is 2000 mg/kg equal to human dose

DISCUSSION

CHAKRA MATHIRAI WITH INJI JUICE AND HONEY was administered single time at the doses of 100mg, 250mg, 500mg, 1000mg and 2000mg/kg to female Wister rats and observed for consecutive 14 days after administration. Doses were selected based on the pilot study and literature review. All animals were observed daily once for any abnormal clinical signs. Weekly body weight and food consumption were recorded. No mortality was observed during the entire period of the study. Data obtained in this study indicated no significance physical and behavioral signs of any toxicity due to administration of **CHAKRA MATHIRAI WITH INJI JUICE AND HONEY** at the doses of 100 mg, 250mg ,500mg, 1000mg and 2000mg/kg to female Wister rats.

At the 14th day, all animals were observed for functional and behavioral examination. In functional and behavioral examination, home cage activity, hand held activity were observed. Home cage activities like Body position, Respiration, Clonic involuntary movement, Tonic involuntary movement, Palpebral closure, Approach response, Touch response, Pinna reflex, Sound responses, Tail pinch response were observed. Handheld activities like Reactivity, Handling, Palpebral closure, Lacrimation, Salivation, Piloercetion, Papillary reflex, abdominal tone, Limb tone were observed. Functional and behavioral examination was normal in all treated groups. Food consumption of all treated animals was found normal as compared to normal group.

SUMMARY & CONCLUSION:

Summary:

The present study was conducted to know single dose toxicity of **CHAKRA MATHIRAI WITH INJI JUICE AND HONEY** on female Wister rats. The study was conducted using 15 female Wister rats. The female animals were selected for study of 8- 12 weeks old with weight range of within ± 20 % of mean body weight at the time of randomization. The groups were numbered as group I, II, III, IV and V and dose with 100mg, 250mg, 500mg, 1000mg and 2000mg/kg of **CHAKRA MATHIRAI WITH INJI JUICE AND HONEY**. The drug was administered by oral route single time and observed for 14 days. Daily the animals were observed for clinical signs and mortality.

There were no physical and behavioral changes observed in Female Wister rats during 14 days. Mortality was not observed in any treatment groups.

CONCLUSION:

The study shows that **CHAKRA MATHIRAI WITH INJI JUICE AND HONEY** did not produce any toxic effect at dose of 100mg, 250mg, 500mg, 1000mg and 2000mg/kg to rats. So No-Observed-Adverse-Effect-Level (NOAEL) of **CHAKRA MATHIRAI WITH INJI JUICE AND HONEY** is 2000 mg/kg.

7.0 ABBREVIATIONS

No.	Number
Mg	Milligram
Kg	Kilogram
LD_{50}	Lethal Dose $_{50}$
p.o	peros
ML	Milliliter
%	percentage
R&D	Research and Development
g%	Gram percentage
g	Gram
NOAEL	No-Observed-Adverse-Effect-Level
MLD	Minimum Lethal Dose
MTD	Maximum Tolerated Dose
OECD	Organisation of Economic Co-operation and Development
CPCSEA	Committee for the Purpose of Control and Supervision of Experiments on Animals

8.0 REFERENCES:

1. OECD. Guideline for Testing of Chemicals 423, Acute oral toxicity (acute toxic class method). December 2001.

SUB-ACUTE TOXICITY STUDY IN WISTER RATS TO EVALUATE TOXICITY PROFILE OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY

Objective

The objective of this study is to evaluate the toxic effects, if any, as a result of the repeated once daily oral administration of **VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY** to Wister Albino rats for a minimum period of 28 consecutive days. This study will provide information on any major toxic effects, target organs and a rationale for concluding the No-Observed-Adverse-Effect-Level (NOAEL) and/or No Observed Effect Level (NOEL) / LOEL (Low Observed Effect Level) and risk assessment in humans.

1. **Test Guidelines**

This study plan is prepared as per the following guidelines:

Schedule – Y, Amendment version 2005, Drugs and Cosmetics Rules, 1945.

OECD – 407 – Repeated dose 28-day Oral Toxicity Study in Rodents, Adopted 3 October, 2008.

1.1. Test System Details

Species	:	Rat
Strain	:	Wister Albino
Source	:	Sree Venkateshwara Enterprises Pvt Ltd, Bangalore
Age	:	6-8 weeks
Sex	:	Male / Female (nulliparous and non-pregnant)
Body weight	:	0to 180.0 g

1.2. Acclimatization

Animals will be allowed to acclimatize to the experimental room conditions for five days prior to the commencement of dosing. During the acclimatization period, the animals will be observed daily for any apparent adverse clinical signs. Prior to assignment to the study and commencement of treatment, a detailed physical health examination will be performed on all animals by a veterinarian and animals with any evidence of ill health or poor physical condition will not selected for the study.

1.3. Randomization and Grouping

On the starting day of dosing, the animals will be weighed and health examination will be performed by veterinarian. Animals will be randomly allocated to different groups according to their body weight by using MS-Excel sheet as described in the

randomization SOP. Animals will be divided into four groups (vehicle control, low, intermediate, and high dose). At the initiation of the treatment, the body weight variation between the groups did not exceed ±20% of the mean weight of each sex.

1.4. Animal Identification

In each cage, animals will be identified with numbers by marking at the base of the ear. The cages will be identified with an attached colored cage label showing study number, study code, group number, sex, dose, strain, species, cage number, route of administration and animal number.

2. **Animal Husbandry**

2.1. Animal Welfare and approval

The study was approved by the IAEC (SLS) and Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA registration number: Abc14).Their recommendations regarding animal care and handling will be followed.

2.2. Environmental Conditions

The temperature of the experimental room will be maintained at 22±3^{0}C and the relative humidity between 30-70 %. The photoperiod will be 12 hours light and 12 hours dark cycles

2.3. Housing Conditions

Two animals will be housed in autoclaved polypropylene rat cages (Size in mm=L x W x H: 430 x 290 x 160) using paddy husk as the bedding material. Each cage will be fitted with a top grill having provision for keeping rodent pellet feed and an autoclaved polypropylene water bottle with stainless steel drinking nozzle. Cages will be placed on 3-tier racks and cage rotation will be performed every week. Cages will be changed at least twice a week. The cages and water bottles will be cleaned and autoclave sterilized.

2.4. Sanitation

Each day, the floor of the animal room will be swept and mopped. Cages and bedding material will be changed once in three days and water bottles will be changed daily. All the experimental procedures will be done in a clean environment.

2.5. Feed

The experimental animals will be provided with irradiated rodent pellet feed *ad libitum* supplied from Sai feeds Pvt ltd, Chennai . Feed will be withheld for four hours prior to blood collection and necropsy.

2.6. Drinking Water

Animals will be provided with filtered drinking water *ad libitum* passed through water filter system (Aquaguard™) in autoclaved polypropylene bottles. Water bottles will be changed daily. Microbial analysis of water will be carried out once monthly and the report is maintained in the study file.

3. **Personnel Safety**

All personnel handling animals undergo regular medical examination. Protective clothing like apron, face mask, head cap, and gloves will be used to maintain hygienic conditions.

4. **Materials and Methods**

4.1. Preparation of Dose formulation

The dose formulation will be prepared under aseptic conditions as per SLS, SOP.

4.2. Route of Administration and Justification

Administration will be by oral gavage, as it is one of the possible routes of exposure.

4.3. Frequency and Duration of Administration

Once daily for 28 consecutive days

4.4. Dosing Procedure

The test item will be administered in once daily by oral gavage using a suitable intubation cannula fitted with a graduated syringe. The scheme of dosing and sacrifice time points are presented in the below below Table.

4.5. Experimental Procedures

All experimental procedures will be performed in accordance with the Study plan and Standard Operating Procedures (SOPs) of SLS.

CONVERSION FORMULA:

Human dose is 130 mg /kg day

Total clinical dose (a) x conversion factor (b) 0.018 = (c) per 150 gm of Rat

130 mg x 2(a) x 0.018 (b) = 2.34 (c) /150 gm of Rat

2.34/1000x150 = 0.351 mg /kg/rat

Experimental Doses Calculated as per the standard procedures are

S.No	Groups	Dose /kg, weight	Volume of administration
1	Vehicle Control	**INJI JUICE AND HONEY**	1 ml
2	Therapeutic Dose	0.351 mg /kg	1 ml
3	Middle Dose	1.755mg/kg	1 ml
4	High Dose	8.775mg/kg	1 ml

Experimental Design

Group No.	Group	Dose (mg/kg b.wt /day)	No. of Animals	
			Male	Female
G1	Vehicle control	**Inji Juice And Honey**	5	5
G2	Low dose of **VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY**	0.351 mg/kg	5	5
G3	Intermediate dose **VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY**	1.755mg/kg	5	5
G4	High dose **VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY**	8.775mg/kg	5	5

5. Observations

Animals will be observed daily throughout the treatment period at regular intervals. During the treatment period, animals will be observed twice daily for any clinical signs of toxicity, morbidity and mortality. All the surviving animals will be sacrificed at the end of scheduled period and subjected to gross necropsy and histopathological evaluations.

5.1. Clinical Signs

All the animals will be subjected to cage-side (home-cage) observations twice a day for any clinical signs of toxicity, preferably at the same time each day and considering the peak period of anticipated effect. In addition to home cage observations, a detailed

clinical examination will be performed once prior to dosing and weekly thereafter during treatment period.

5.2. Morbidity/ Mortality

All animals will be examined twice a day for mortality and signs of morbidity.

5.3. Body Weights

Body weights will be recorded at the beginning of acclimatization, before randomization, there after at weekly intervals and at the time of necropsy.

5.4. Feed Consumption

Feed consumption will be calculated on a weekly basis throughout the study period.

5.5. Haematology and Clinical Biochemistry

Hematology and clinical biochemistry tests will be performed with terminally collected blood samples on day-29 from all animals. Animals will be deprived of feed overnight and blood samples will be collected by tapping the ear for visibility of the vein site and inserted the needle into the marginal ear vein and collected the blood into micro centrifuge tube. Approximately 0.5 ml of blood will be collected in vials containing 1% EDTA (20µl) as an anticoagulant for hematological analysis.

Approximately 2 ml blood will be collected from each animal in micro centrifuge tubes containing 15µl of heparin (19 units) and the plasma will be separated by centrifugation at 4000 rpm for ten minutes at 4^{o}C. The plasma will be stored at -20 ^{o}C ± 2 and used for all clinical chemistry analysis.

5.6. Hematology

Erythrocyte count (RBC), Total Leucocyte count (WBC), Hemoglobin (Hb), Hematocrit (HCT), Mean Corpuscular Volume (MCV), Mean Corpuscular Hemoglobin (MCH), Mean Corpuscular Hemoglobin Concentration (MCHC) and Platelet (PLTC).

5.7. Clinical Biochemistry

Glucose, Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST), Alkaline phosphatase (ALP), Total protein, Albumin, Creatinine, Urea, Cholesterol, Triglycerides, Sodium, Potassium, Calcium, and Chloride.

5.8 Pathology

All animals will be euthanized by CO_2 asphyxiation and subjected to necropsy under the supervision of the veterinary pathologist. Different tissues/organs of thoracic, abdominal and cranial cavities will be examined for any gross pathological changes. Tissues from vehicle control and high dose groups will be subjected to detailed

histopathological analysis (Ovaries/ testes, kidneys, liver, lungs). The organs will be fixed using Bouin's (reproductive organs) and 10% neutral buffered formalin (kidneys, liver, spleen, lungs).Processing of tissue will be done by spin tissue processer, embedding of the tissue by tissue embedder. The tissues will be initially trimmed to 10-20µ thickness and later 3-6µ to obtain thinner tissue sections by using rotary microtome. Haematoxylin and Eosin staining will be performed for all tissues.

5.8. Organ Weights

Absolute weights of adrenal glands, brain, ovaries/testes, epididymis/uterus, heart, kidneys, liver, spleen and lungs will be recorded for all the animals after trimming adherent tissue immediately after dissection from the animal. Paired organs will be weighed together. Relative weights of these organs against fasting animal body weights will be calculated and reported.

6. **Data Compilation**

Data will be summarised in a tabular form showing the number of animals, experimental design, dose groups, dose volume and concentrations, test item and vehicle control details. All findings like clinical signs, mortality and morbidity data, time of death, body weights, feed consumption, clinical signs, and necropsy and pathology observations will be recorded and given in the final report. One original copy of the final report is issued to the sponsor.

7. **Statistical Analysis**

All the parameters of treated groups of both sex, viz. body weight, feed consumption, organ weights (absolute and relative), biochemical parameters, and hematology parameters will be analyzed using SPSS software, version 16.0 by using one-way ANOVA test with multiple comparison (vehicle controls treated groups) in the study report, and p value < 0.05 is considered as statistically significant.

8. **References**

1. Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) guidelines for Laboratory Animal Facility, The Gazette of India, 1998.
2. Hayes AW, 2000. Principles and Methods of Toxicology, 4th ed., Taylor and Francis, London.
3. Karl-Heinz Diehl, R. H. (2001). A Good Practice Guide to the Administration of Substances and Removal of Blood, Including Routes and Volumes. journal of applied toxicology , 15-23.

4. OECD – 407 - Repeated dose 28-day oral Toxicity Study in Rodents, Adopted October 3, 2008.
5. Schedule – Y, Amendment version 2005, Drugs and Cosmetics Rules, 1945.

MATERIALS AND METHODS

ESTIMATION OF HEMATOLOGICAL PARAMETERS: [1]

Collection of blood for hematological studies

After the treatment period the animals were anaesthetized by ketamine hydrochloride and the blood was collected from Retro-orbital sinus by using capillary into a centrifugation tube which contains EDTA for haematological parameters The haematological parameters like RBC, WBC and Hb percentage, Differential cell count, MCV, MCHC, Hematocrit, MCH, platelet count were estimated by the following procedures.

1. ENUMERATION OF RED BLOOD CELLS: [1] Ramnic 2007)

Reagents : RBC diluting fluid

Procedure:

Using a red blood cell pipette of haemocytometer, well mixed blood was drawn up to 0.5 mark and RBC diluting fluid was taken up to mark II. The fluid blood mixture was shaken and transferred onto the counting chamber. The cells were allowed to settle to the bottom of the chamber for 2 min. See the fluid does not get dried. Using 45X or high power objective the RBC's were counted uniformly in the larger corner squares.

The cells were expressed as number of cells $x10^{12}/l$

2. ENUMERATION OF WBC: [2] John 1972)

Reagents:

Turk's fluid: Turk's fluid was prepared by mixing 2ml of acetic acid with 100 ml of distilled water. To this 10 drop of aqueous methylene blue 3 % w/v) was added. This solution haemolysis the red cells due to acidity so that counting of white cells becomes easy.

Procedure:

Using a white blood cell pipette of haemocytometer, well mixed blood was drawn up to 0.5 mark and WBC diluting fluid was taken up to mark II. The fluid blood mixture was shaken and transferred onto the counting chamber. The cells were

allowed to settle to the bottom of the chamber for 2 min. See the fluid does not get dried.

Using 10X or low power objective the WBC's were counted uniformly in the larger corner squares.

The cells were expressed as number of cells/10mm.

3. DIFFERENTIAL LEUCOCYTE COUNT: [3] John 1972)

Reagent:

Leishmann's stain: 150mg of powdered leishmann's stain was dissolved in 133ml of acetone free methanol.

Procedure:

A blood film stained with leishmann's stain was examined under oil immersion and the different types of WBCs were identified. The percentage distribution of these cells was then determined. Smears were made from anticoagulant blood specimens and stained with leishmann's stain. The slides were preserved for counting the number of lymphocytes and neutrophils, per 100 cells were noted.

From the different Leukocyte count and WBC count, absolute lymphocyte and neutrophil count were calculated.

$$\text{Absolute neutrophil count} = \frac{\text{Number of neutrophils}}{100} \times \text{TWBC}$$

$$\text{Absolute lymphocyte count} = \frac{\text{Number of lymphocytes}}{100} \times \text{TWBC}$$

DETERMINATION OF BIOCHEMICAL PARAMETERS:

For assessment of biochemical parameters, blood samples were collected from the animals by puncturing the retro-orbital plexus and centrifuged. The serum collected after centrifugation was analyzed for various biochemical parameters like SGOT, SGPT, ALP,TC.TG,HDL All of the above biochemical parameters were estimated using semi autoanalyzer (Photometer 5010 $_{V5+}$, Germany) with enzymatic kits procured from Piramal Healthcare limited, Lab Diagnostic Division, Mumbai, India.

1. Total Cholesterol (TC)

Principle

Determination of cholesterol is done after enzymatic hydrolysis and oxidation. The colorimetric indicator is quinoneimine, which is generated from 4-aminoantipyrine and phenol by hydrogen peroxide under the catalytic action of peroxidase (trinder's reaction).

$$\text{Cholesterol ester} + H_2O \xrightarrow{CHE} \text{Cholesterol} + \text{Fatty acid}$$

$$\text{Cholesterol} + O_2 \xrightarrow{CHO} \text{Cholesterol-3-one} + H_2O_2$$

$$2H_2O_2 + \text{4- Amino antipyrine} + \text{Phenol} \xrightarrow{POD} \text{Quinonelimine} + 4\ H_2O_2$$

Method

CHOD-PAP: Enzymatic photometric test

Table 6: Reagents

Goods buffer (pH 6.7)	50 mmol/ l
Phenol	5 mmol/l
4-aminoantipyrine	0.3 mmol/l
Cholesterol estrase	> 200 U/l
Cholesterol oxidase	> 100 U/l
Peroxidase	3 KU/l
Standard	(5.2 mmol/l)

Assay procedure

a. 1 ml (1000 µl) of reagent-1 is taken in a 5 ml test tube.
b. Added 0.01 ml (10 µl) of serum.
c. Mixed well and incubated at 37°C for 5 min.
d. Read the test sample.

NORMAL RANGE: < 200 mg/dl in serum.

1. Deeg R, Ziegenhorn J, Kinetic enzymatic method for automated determination of total cholesterol in serum, Clin. Chem., 1983, 29:1798-802.

2. Triglycerides

Principle

Determination of triglycerides (TG) alters enzymatic splitting with lipoprotein lipase. Indicator is quinoneimine which is generated from 4-aminoantipyrine and 4-chlorophenol by hydrogen peroxidase under the catalytic action of peroxidase.

$$\text{Triglycerides} \xrightarrow{\text{LPL}} \text{Glycerol + fatty acid}$$

$$\text{Glycerol + ATP} \xrightarrow{\text{GK}} \text{Glycerol-3-phosphate+ ADP}$$

$$\text{Glycerol-3-phosphate} + O_2 \xrightarrow{\text{GPO}} \text{Dihydroxyaceton phosphate} + H_2O_2$$

$$2H_2O_2 + \text{4- Amino antipyrine + 4- chlorophenol} \xrightarrow{\text{POD}} \text{Quinonelimine + HCL +}\ 4H_2O_2$$

Method

Colorimetric enzymatic test using glycerol-3-phosphate-oxidase (GPO).

Reagents

Components and concentrations in the test Goods buffer pH 7.2, 50 mmol/ l

Table 7: Reagents

4-chloroPhenol	4 mmol/l
ATP	2 mmol/l
Mg^{2+}	15 mmol/l
Glycerokinase	> 0.4 Kμ/l
Peroxidase	> 2 Kμ/l
Lipoprotein lipase	> 4 Kμ/l
4-aminoantipyrine	0.5 mmol/l
Glcerol-3-phosphate- oxidase	> 1.5Kμ/l
Standard	(2.3 mmol/l)

Assay procedure

a. 1 ml (1000 μl) of reagent-1 is taken in a 5 ml test tube.
b. Added 0.01 ml (10 μl) of serum.
c. Mixed well and incubated at 37˚C for 15 min.
d. Read the test sample.

Normal Range: < 200 mg/dl in serum.

1. Cole T.G, Klotzsch S.G, Mcnarmara J, Measurement of triglyceride concentration, In Rifai N, Warnick G.R, Dominiczak M.H, Handbook of lipoprotein testing, Washington:AACC, Press, 1997, 115-26.

3. HDL Cholestrol

Principle

Chylomicrons, VLDL and LDL are precipitated by adding phosphotungstic acid and magnesium ions to the sample. Centrifugation leaves only the HDL in the supernatant. The cholesterol content in it is determined enzymatically.

Method

Phosphotungstic acid precipitation method.

Table 8: Reagents

Phosphotungstic acid	0.55 mmol/l
Magnesium chloride	25 mmol/l

Assay procedure

A. Preparation of supernatant for the HDL-CHL estimation

Added 200 µl of serum to the 500 µl of HDL-Cholesterol precipitating reagent (from HDL kit) in 1.5 ml centrifuge tube and mixed well. Centrifuged the above solution at 4000 rpm for 10 min.

B. Preparation of test sample for the estimation of HDL-Cholesterol

a. Taken 1000 µl of reagent-1 (from cholesterol kit) in a 5 ml test tube.
b. Added, 100 µl of supernatant from above centrifuged solution
c. Mixed well and incubated at 37°C for 15 min.
d. Read the test sample.

Normal Range: > 60 mg/dl in serum.

1. Friedewald W.T, Levy R.T, Frederickson D.S, Estimation of VLDL and LDL cholesterol, Clin. Chem., 1972, 18:499-502.

4. ESTIMATION OF SERUM GLUTAMATE PYRUVATE TRANSAMINASES (SGPT/ ALT)

1. Determination of aspartate aminotransferase (AST)

Aspartate aminotransferase, also known as Glutamate Oxaloacetate Transaminase (GOT) catalyses the transamination of L-aspartate and α keto glutarate to form oxaloacetate and L- glutamate. Oxaloacetate formed is coupled with 2,4-Dinitrophenyl hydrazine to form hydrazone, a brown coloured complex in alkaline medium which can be measured colorimetrically.

Reagents

Buffered aspartate (pH 7.4); 2,4- DNPH reagent; 4N sodium hydroxide; working pyruvate standard; solution I (prepared by diluting 1 ml of reagent 3 to 10 ml with purified water).

Procedure

Rietman and Frankle method was adopted for the estimation of SGOT. (Reitmann S, Frankel S, 1957. A colorimetric method for the determination of serum oxaloacetic and glutamic pyruvate transminases. American Journal of Clinical Pathology.28: 56-63.The reaction systems used for this study included blank, standard, test (for each serum sample) and control (for each serum sample). 0.25 ml of buffered aspartate was added into all the test tubes. Then 0.05 ml of serum was added to the test group tubes and 0.05 ml of working pyruvate standard into the standard tubes. After proper mixing, all the tubes were kept for incubation at 37^{o}C for 60 min, after which 0.25 ml each of 2,4- DNPH reagent was added into all the tubes. Then, 0.05 ml of distilled water and 0.05 ml of each serum sample was added to the blank and the serum control tubes respectively. The mixture was allowed to stand at room temperature for 20 min. After incubation, 2.5 ml of solution I was added to all test tubes. Mixed properly and optical density was measured in a spectrophotometer at 505 nm within 15 min.

The enzyme activity was calculated as:-

AST (GOT) activity in IU/L) = [(Absorbance of test **-** Absorbance of control)/ (Absorbance of standard - Absorbance of blank)] x concentration of the standard

2. Determination of alanine aminotransferase (ALT)

Alanine aminotransferase, also known as Glutathione Peroxidase (GPT) catalyses the transamination of L-alanine and α keto glutarate to form pyruvate and L-Glutamate. Pyruvate so formed is coupled with 2,4 – Dinitrophenyl hydrazine to form a corresponding hydrazone, a brown coloured complex in alkaline medium which can be measured colorimetrically.

Reagents

Buffered alanine (pH 7.4), 2,4–DNPH, 4N sodium hydroxide, working pyruvate standard, solution I (prepared by diluting 1 ml of reagent 3 to 10 ml with purified water).

Procedure

Rietman and Frankle method was dopted for the estimation of SGPT. The reaction systems used for this study included blank, standard, test (for each serum sample) and control (for each serum sample). 0.25 ml of buffered alanine was added into all the test tubes. This was followed by the addition of 0.05 ml of serum into the test group tubes and 0.05 ml of working pyruvate standard into the standard tubes. After proper mixing, all the tubes were kept for incubation at 37^{o}C for 60 minutes, after which 0.25 ml each of 2,4- DNPH reagent was added into all the tubes. Then, 0.05 ml of distilled water and 0.05 ml of each serum sample was added to the blank and the serum control tubes respectively. The mixture was allowed to stand at room temperature for 20 min. After incubation, 2.5 ml of solution **I** was added to all test tubes. Mixed properly and optical density was read against purified water in a spectrophotometer at 505 nm within 15 min.

The enzyme activity was calculated as:- ALT (GPT) activity in IU/L) = [(Absorbance of test **-** Absorbance of control)**/** (Absorbance of standard - Absorbance of blank)] x concentration of the standard.

3. Determination of alkaline phosphatase (ALP)

Alkaline phoshatase from serum converts phenyl phosphate to inorganic phosphate and phenol at pH 10.0. Phenol so formed reacts in alkaline medium with 4-aminoantipyrine in presence of the oxidising agent potassium ferricyanide and forms an orange-red coloured complex, which can be measured spectrometrically. The color intensity is proportional to the enzyme activity.

Reagents:

Buffered substrate

Chromogen Reagent

Phenol Standard, 10 mg%

Procedure:

ALP was determined using the method of Kind (Kind PRM, King EJ, 1972. *In-vitro* determination of serum alkaline phosphatase. Journal of Clinical Pathology 7: 321-22\). The working solution was prepared by reconstituting one vial of buffered substrate with 2.2 ml of water. 0.5 ml of working buffered substrate and 1.5 ml of purified water was dispensed to blank, standard, control and test. Mixed well and incubated at 37^0C for 3 min. 0.05 ml each of serum and phenol standard were added to test and standard test tubes respectively. Mixed well and incubated for 15 min at 37^0C. Thereafter, 1 ml of chromogen reagent was added to all the test tubes. Then, added 0.05 ml of serum to control. Mixed well after addition of each reagent and the O.D of blank, standard, control and test were read against purified water at 510 nm.

Serum alkaline phosphatase activity in KA units was calculated as follows

[(O.D. Test-O.D. Control) / (O.D. Standard- O.D. Blank)] x 10

4. Determination of bilirubin

In toxic liver, bilirubin levels are elevated. Hyperbilirubinemia can result from impaired hepatic uptake of unconjugated bilirubin, such a situation can occur in generalized liver cell injury, certain drugs (e.g Rifampin and probenecid) interfere with the rat uptake of bilirubin by the liver cell and may produce a mild unconjugated hyperbilirubinemia. Bilirubin level rises in diseases of hepatocytes, obstruction to bilirubin excretion into duodenum, in haemolysis and defects of hepatic uptake and conjugation of Bilirubin pigment such as Gilbert's disease.

Elevation of total serum bilirubin may occur due to:

1. Excessive haemolysis or destruction of the red blood cells.Eg:Haemolytic disease of the new born.
2. Liver diseases.Eg.Hepatitis and cirrhosis.
3. Obstruction of the biliary tract.Eg.Gall stones.

The method is based on the reaction of Sulfonilic acid with sodium nitrite to form azobilirubin which has maximum absorbance at 546nm in the aqueous solution. The intensity of the color Produced is directly proportional to the amount of direct or total bilurubin concentration present in the sample.

Reagents

1. Diazo A-(Reagent-R1) :Ready to use
2. Diazo B-(Reagent-R2):Ready to use
3. Bilirubin Activater :Ready to use

Procedure

Kind & King's method was followed for the estimation of Bilirubin. Five hundred µl of working reagent was added to 50 µl of rat serum & incubated for 5 min at 37°C. Absorbance was measured AT 546 NM in semi auto analyzer against the standard.

The Bilirubin content was calculated using the following equation:

Total bilirubin (mg/dt) = Abs of the sample blank x 15.

Direct Bilirubin(mg/dt) = Abs of sample blank x 10.

5. ESTIMATION OF UREA

Urea is the nitrogen-containing end product of protein catabolism. States associated with elevated levels of urea in blood are referred to as hyper uremia or azotemia.

Method

Estimation of urea was done by Urease-GLDH: enzymatic UV test.

Principle

$$\text{Urea} + 2H_2O \xrightarrow{\text{Urease}} 2NH_4 + 2HCO_3$$

$$\text{2- Oxoglutarate} + NH_4^+ + \text{NADH} \xrightarrow{\text{GLDH}} \text{L- Glutamate} + NAD^+ + H_2O$$

Table 14. Reagents

R 1	TRIS pH 7.8	120 mmol/l
	2-Oxoglutarate	7 mmol/l
	ADP	0.6 mmol/l
	Urease	≥ 6 KU/l
	GLDH	≥ 1 KU/l
R 2	NADH	0.25 mmol
R 3	Standard	40 mg/dl

Procedure

a. Take 1000 µl of reagent-1 and 250 µl of reagent-2 in 5 ml test tube.
b. To this, add 10 µl of serum.
c. Mix well and immediately read the test sample at 340 nm Hg 334 nm Hg 365 nm optical path 1 cm against reagent blank (2-point kinetic).
d. And note down the value.

Normal range: 10 – 50 mg/dl.

6. ESTIMATION OF URIC ACID

Uric acid and its salts are end products of the purine metabolism. In gout the most common complication of hyperuricemia, ie. Increased serum levels of uric acid lead to formation of monosodium urate crystal around the joints.

Method

Enzymatic photometric test using TOOS (N ethyl- N (hydroxyl -3- sulfopropyl)-m-toluidin)

Principle

Uric acid + H_2O + O_2 $\xrightarrow{\text{uricase}}$ Allantoin +CO_2 +H_2O_2

TOOS + 4 aminoantipyrine + $2H_2O_2$ $\xrightarrow{\text{POD}}$ Indamine + $3H_2O$

Table 15.reagents

R1	Phosphate buffer pH 7.0	100mmol/l
	TOOS	1mmol/l
	Ascorbate oxidase	≥1 KU/l
R2	Phosphate buffer pH 7.0	100mmol/l
	4- amino antipyrine	0.3mmol/l
	K_4 (Fe(CN)$_6$)	10µmol/l
	Peroxidase	≥1KU/l
	Uricase	≥50U/l

Procedure

a. Take 800µl of reagents -1 in a2ml centrifuge tube.
b. To this add 20µl of serum.
c. Mix well and incubate at 30°c for 5 minutes.
d. Then add 200µl of reagent2
e. Mix well incubate for 5min at 37°c

f. Measure the not down the values.

Normal range: 1.9-8.2mg/dl

7. ESTIMATION OF CREATININE:

Principle:

Creatinine forms a coloured complex with picrate in alkaline medium.

The rate of formation of the complex is measured.

Reagents:

Reagent 1 Standard Creatinine (2mg/100ml)

Reagent 2 Picric acid solution.

Reagent 3 sodium hydroxide solution

Procedure:

Take 500 µl of reagent -2 and 500 µl of reagent -3 in a 5ml test tube. To this add 100 µl of serum. Mix well and immediately read the test sample at Hg 492 nm 1cm light path and note down the values.

Normal range is 0.6 -1.1 mg/dl.

TABLE: 1 EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON BODY WEIGHT IN Gram (PHYSICAL PARAMETER)

GROUP	CONTROL	LOW DOSE	MIDDLE DOSE	HIGH DOSE
1st wk	132.7±1.43	131±1.342	132.7±1.961	132.3±1.944
2nd wk	138.5±1.408	137±0.9309	140.7±2.362	140.8±1.424
3rd wk	144.5±1.408	144.8±0.7923	150.5±2.79	148.3±1.626
4th wk	150.3±1.52	153.5±1.31	159±3.347	157±1.844

Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.

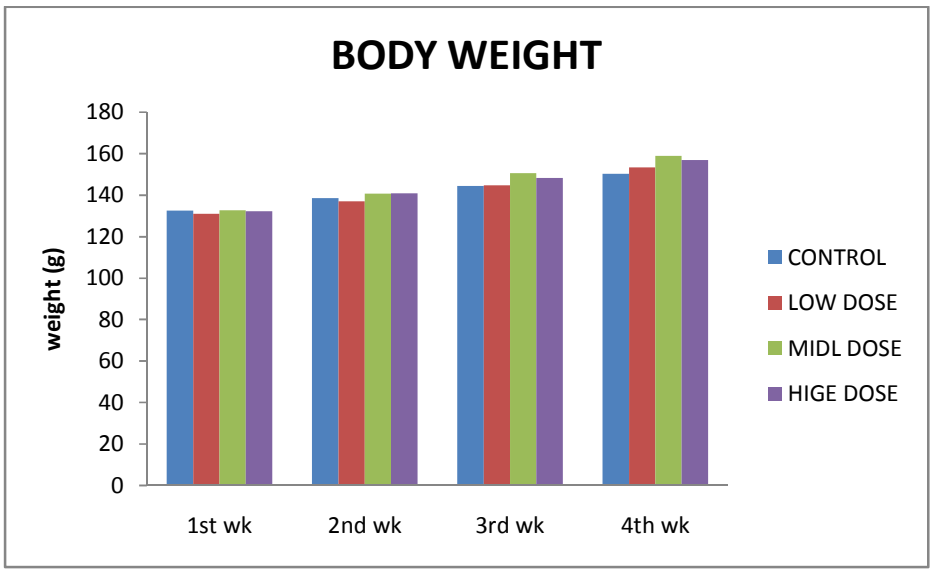


Table-2 **EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON** Food Intake In Gram

Groups	Control		Low Dose		Middle Dose		High Dose	
DAY	Male	Female	Male	Female	Male	Female	Male	Female
Day 1	32	42	36	28	62	40	72	32
DAY2	46	30	48	35	36	58	40	53
DAY3	34	28	66	49	42	30	66	47
Day 4	44	68	42	36	30	18	44	72
DAY5	26	42	38	80	25	36	52	80
Day 6	36	28	56	52	50	42	35	44
DAY7	48	32	72	66	35	36	26	80
DAY8	60	40	56	32	39	54	38	34
Day 9	35	28	30	40	35	66	60	32
DAY10	27	55	18	20	60	32	66	56
Day 11	48	62	26	44	57	18	72	20
DAY12	51	36	44	36	69	44	30	32
DAY13	53	44	44	33	69	58	60	66
Day 14	52	56	26	42	38	26	26	22
DAY15	52	66	30	54	39	34	38	36
Day 16	42	36	30	18	44	32	42	36
DAY17	38	80	25	36	52	46	30	48
DAY18	56	52	50	42	35	34	28	66
Day 19	72	66	35	36	26	44	68	42

DAY20	56	32	39	54	38	28	52	66
DAY21	35	28	30	40	35	35	42	36
Day 22	27	55	18	20	60	49	38	80
DAY23	48	62	26	44	57	36	56	52
DAY24	51	36	44	36	69	45	72	66
Day 25	42	35	44	56	52	50	56	32
DAY26	36	26	80	72	66	35	26	26
DAY27	54	38	34	56	32	39	34	38
DAY28	66	60	32	35	28	30	32	42

Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group

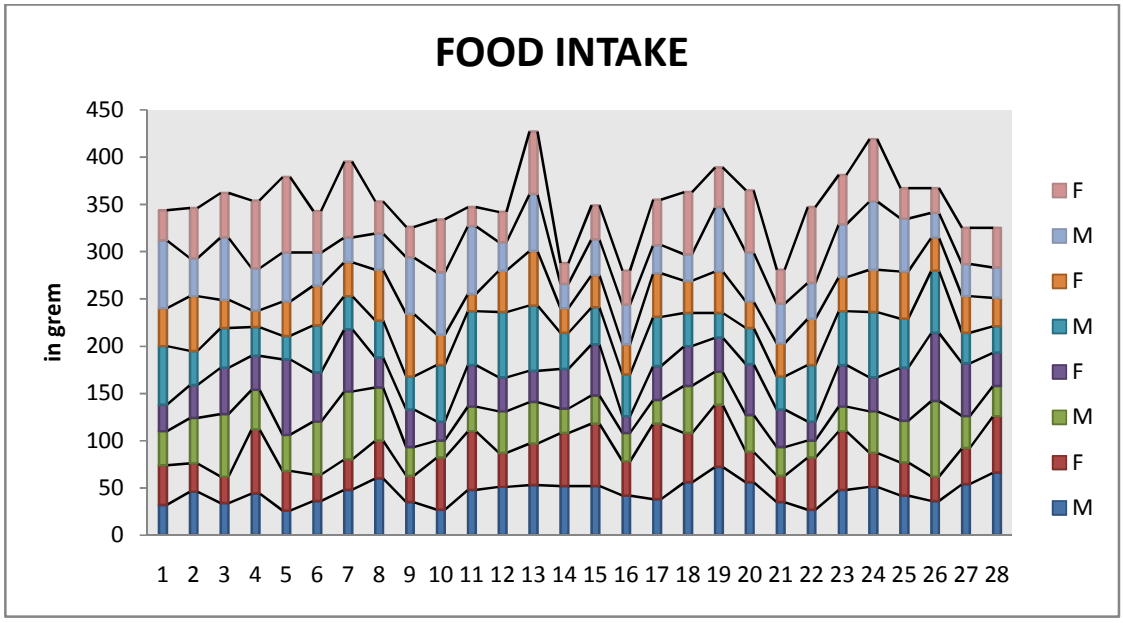


Table-3 **EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON** Water Intake in ml

Groups	**Control**		**Low Dose**		**Middle Dose**		**High Dose**	
DAY	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Day 1	60	120	130	40	120	65	40	85
DAY2	90	135	165	70	130	80	50	90
DAY3	130	40	150	55	60	95	80	65
Day 4	115	85	85	60	60	150	40	140
DAY5	85	100	70	65	40	120	65	40
Day 6	85	90	110	100	110	60	90	85
DAY7	150	55	60	95	80	90	135	165
DAY8	85	60	60	150	40	130	40	150
Day 9	70	65	40	120	65	115	85	85
DAY10	110	100	110	60	90	85	100	70
Day 11	80	95	110	120	90	85	90	110
DAY12	70	80	35	60	60	120	110	95
DAY13	90	40	80	85	30	110	125	110
Day 14	40	65	50	70	60	130	80	115
DAY15	80	120	80	60	110	55	85	70
Day 16	110	80	75	70	40	80	105	80
DAY17	80	65	45	90	105	65	40	40
DAY18	50	80	30	100	60	90	65	55
Day 19	140	70	75	120	100	110	80	55

DAY20	90	65	90	95	80	130	75	90
DAY21	80	95	110	120	90	85	80	120
Day 22	70	80	35	60	60	120	110	80
DAY23	90	40	80	85	30	110	80	65
DAY24	40	65	50	70	60	130	50	80
Day 25	80	120	80	60	110	55	90	110
DAY26	85	30	110	125	110	140	70	75
DAY27	70	60	130	80	115	90	65	90
DAY28	60	110	55	85	70	80	95	110

Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group

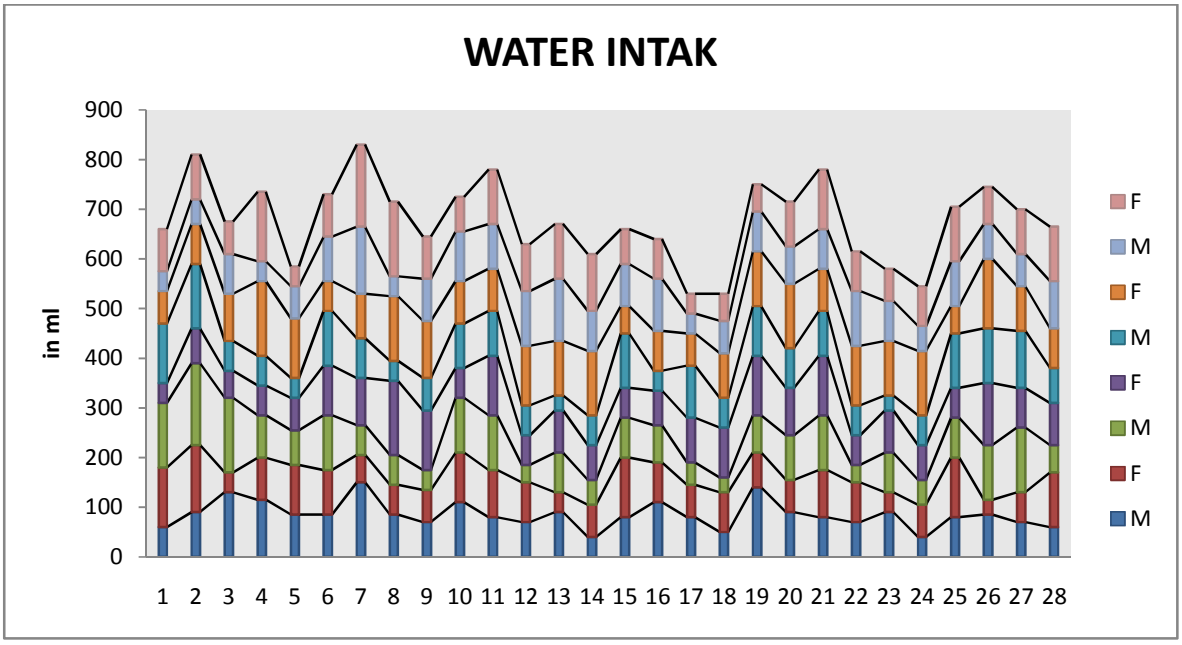
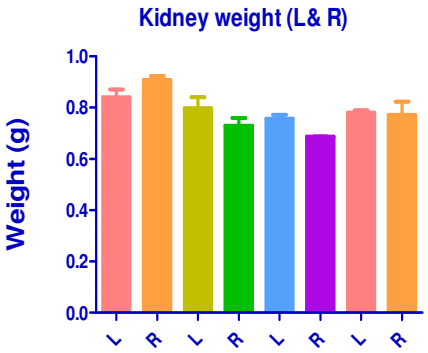


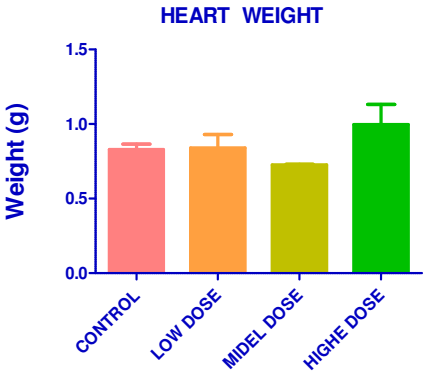
Table-4 **EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON** ORGAN WEIGHT in gms

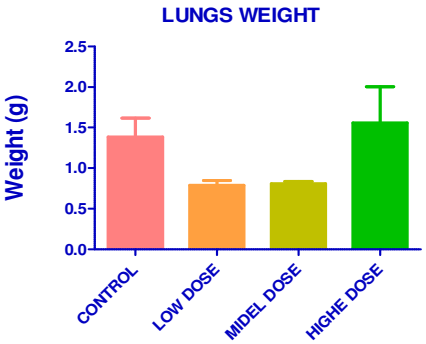
GROUP		CONTROL	Low Dose	Middle Dose	High Dose
LIVER WEIGHT		6.659±0.1334	6.103±0.392	5.947±0.04517	6.449±0.2211
KIDNEY WEIGHT	L	0.8403±0.0297	0.798±0.0433	0.7573±0.01472	0.7803±0.00895
	R	0.909±0.01443	0.7293±0.03031	0.687±0.001155	0.772±0.05196
HEART WEIGHT		0.83±0.0358	0.841±0.08776	0.7263±0.00318	0.997±0.1339
LUNGS WEIGHT		1.384±0.2336	0.791±0.05889	0.812±0.0254	1.558±0.4443
TESTIS WEIGH		2.593±0.2916	2.903±0.06986	1.888±0.2656	2.004±0.01299
UTERUS		0.4903±0.0181	0.4213±0.01934	0.4373±0.04936	0.514±0.1085

Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.

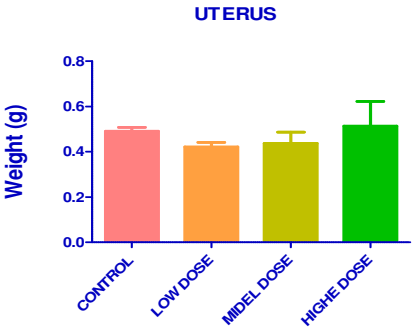

LIVER WEIGHT
Weight (g)
8
6
4
2
0
CONTROL
LOW DOSE
MIDEL DOSE
HIGHE DOSE


Kidney weight (L& R)
Weight (g)
1.0
0.8
0.6
0.4
0.2
0.0
L
R
L
R
L
R
L
R


HEART WEIGHT
Weight (g)
1.5
1.0
0.5
0.0
CONTROL
LOW DOSE
MIDEL DOSE
HIGHE DOSE


LUNGS WEIGHT
Weight (g)
2.5
2.0
1.5
1.0
0.5
0.0
CONTROL
LOW DOSE
MIDEL DOSE
HIGHE DOSE


TESTIS WEIGHT
Weight (g)
4
3
2
1
0
CONTROL
LOW DOSE
MIDEL DOSE
HIGHE DOSE


UTERUS
Weight (g)
0.8
0.6
0.4
0.2
0.0
CONTROL
LOW DOSE
MIDEL DOSE
HIGHE DOSE

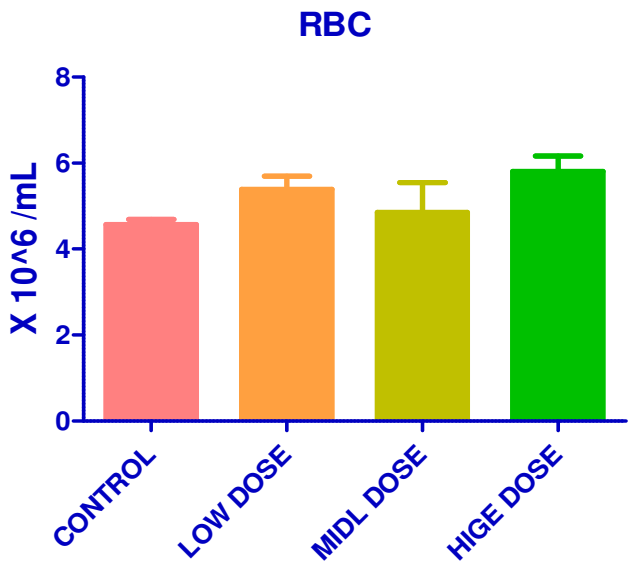
\

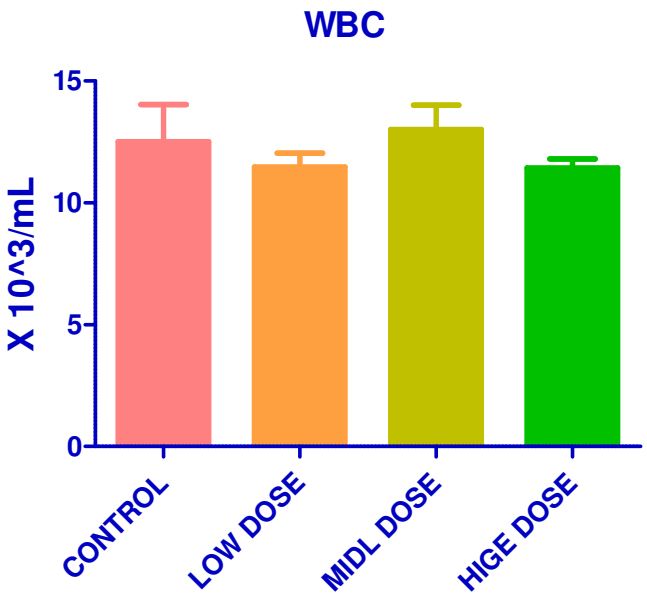
Table-5 **EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON HAEMATOLOGICAL PARAMETERS**

GROUP	CONTROL	LOW DOSE	MIDDLE DOSE	HIGH DOSE
RBC (X10^6/µL)	4.573±0.1139	5.39±0.3035	4.853±0.6894	5.8±0.3617
WBC(X10^3/µL)	12.5±1.531	11.47±0.5783	13±1.007	11.43±0.3756
HB (g/dl)	10.5±0.5859	13.2±0.8963	11.83±1.683	14.03±0.809

.

Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.




WBC
X 10^3/mL
15
10
5
0
CONTROL
LOW DOSE
MIDL DOSE
HIGE DOSE

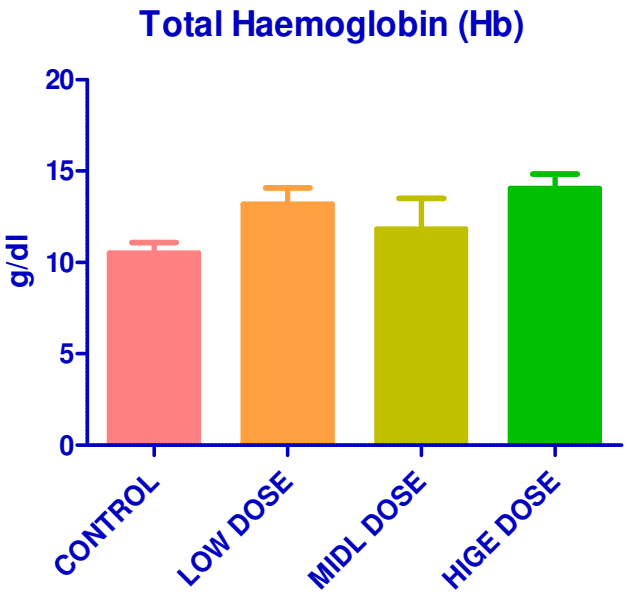
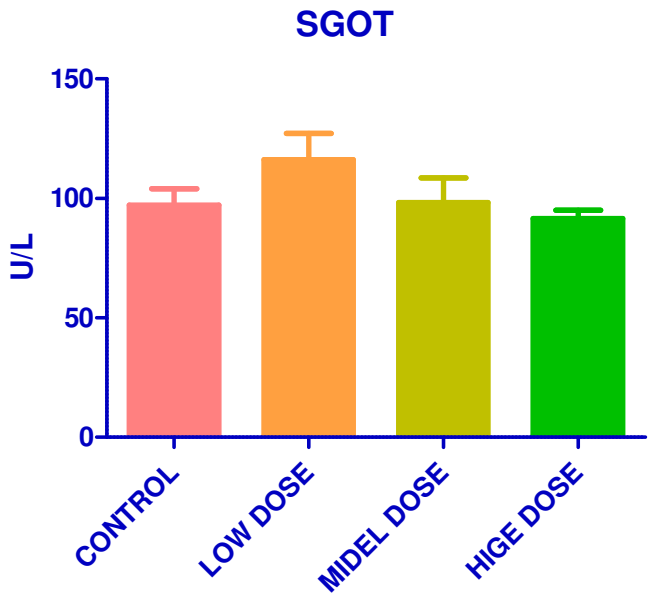
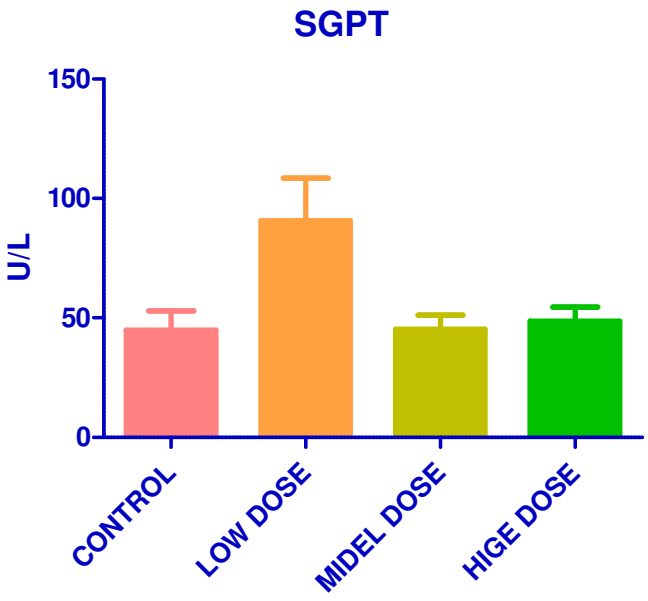

Total Haemoglobin (Hb)
g/dl
20
15
10
5
0
CONTROL
LOW DOSE
MIDL DOSE
HIGE DOSE

Table-5 **EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON BIOCHEMICAL PARAMETERS (LIVER PROFILE)**

GROUP	CONTROL	LOW DOSE	MIDDLE DOSE	HIGH DOSE
SGOT(units/min/liter/mg protein)	97.2±6.835	116.1±11.08	98.37±10.16	91.5±3.523
SGPT (units/min/liter/mg protein)	44.77±8.151	90.73±17.71	45.3±5.852	48.6±6.012
ALP (units/min/liter/mg protein)	210.1±69.74	175.9±11.87	169.9±27.35	186.6±24.95

Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.




SGPT
150
100
50
0
U/L
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE

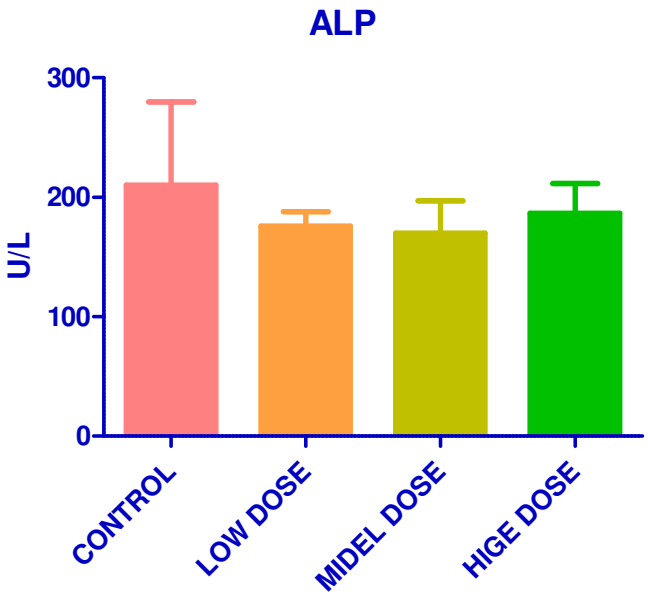

ALP
300
200
100
0
U/L
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE

Table-5 **EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON BIOCHEMICAL PARAMETERS (LIVER PROFILE)**

GROUP	CONTROL	LOW DOSE	MIDDLE DOSE	HIGH DOSE
TOTAL BILIRUBIN (mg/dl)	1.303±0.2452	1.453±0.2822	0.8193±0.3371	0.99±0.194

Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.

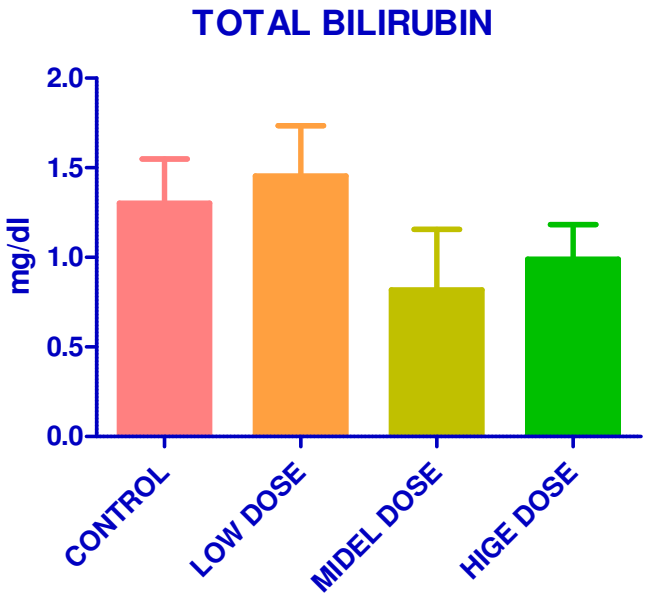
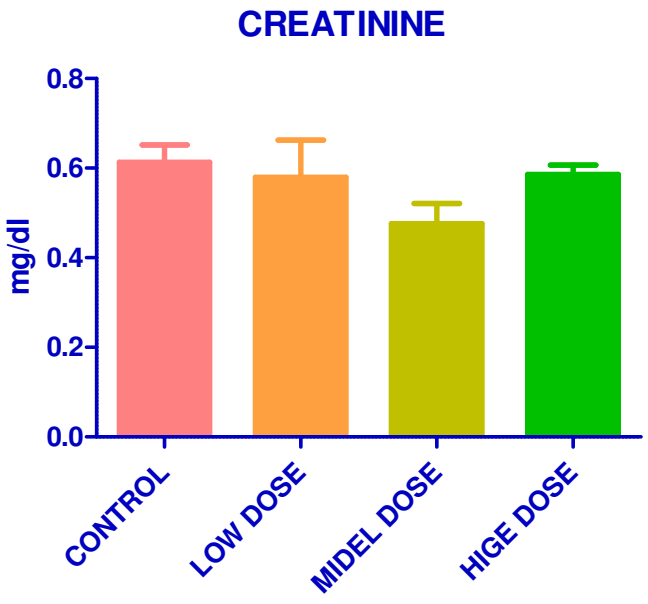


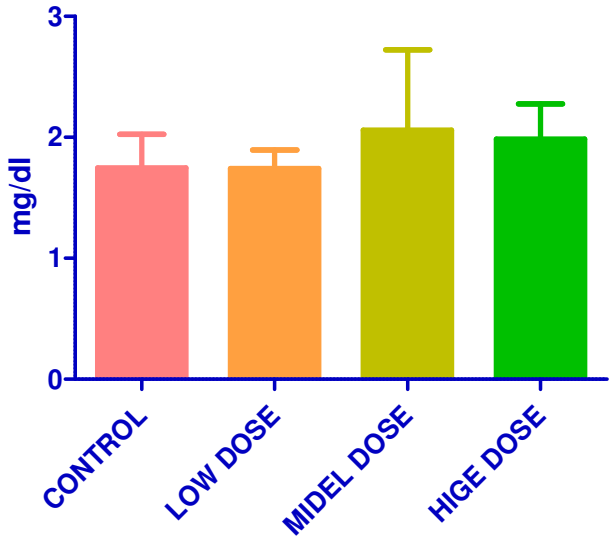
Table-5 **EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON BIOCHEMICAL PARAMETERS (KIDNEY PROFILE)**

GROUP	CONTROL	LOW DOSE 300mg/kg	MIDDLE DOSE 600mg/kg	HIGH DOSE 900mg/kg
CREATININE (mg/dl)	0.6133±0.03844	0.58±0.08327	0.4767±0.0441	0.5867±0.02028
URIC ACID (mg/dl)	1.747±0.2761	1.74±0.155	2.06±0.6612	1.983±0.2924
Urea (mg/dl)	42.4±1.992	45.83±5.802	30.73±1.068	34.4±6.034

Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.



URIC ACID



UREA

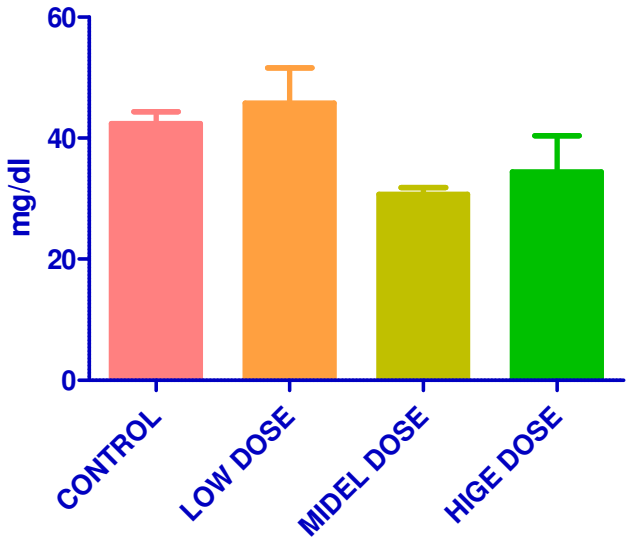
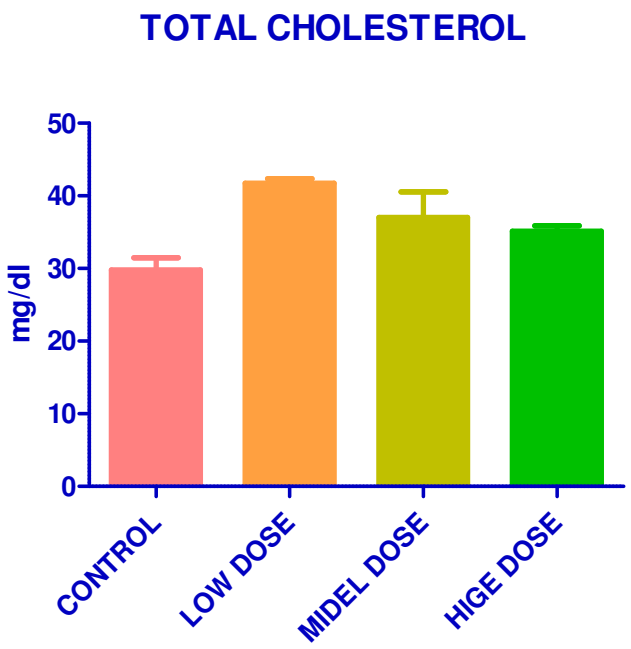
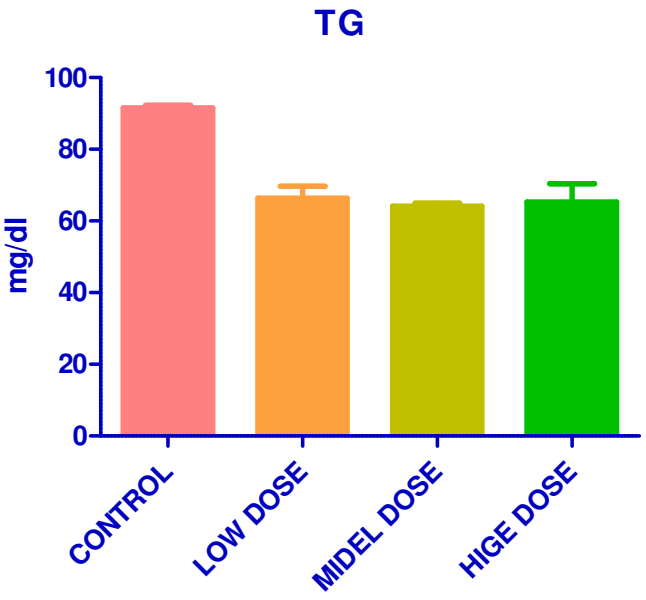


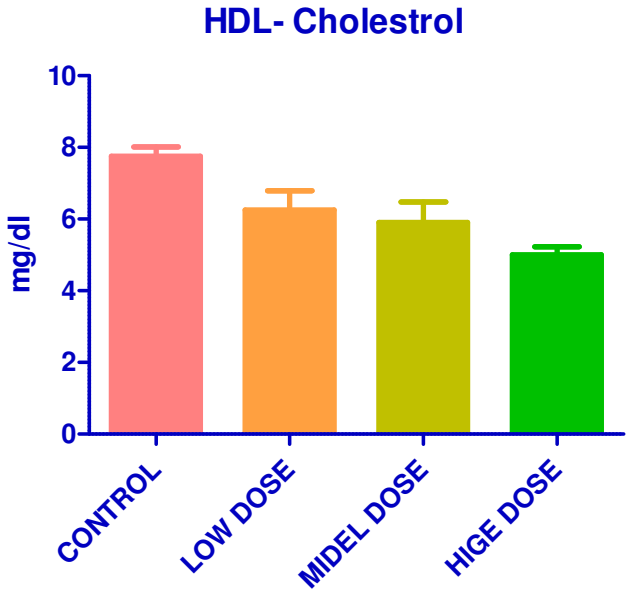
Table-5 **EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON BIOCHEMICAL PARAMETERS (LIPID PROFILE)**:-

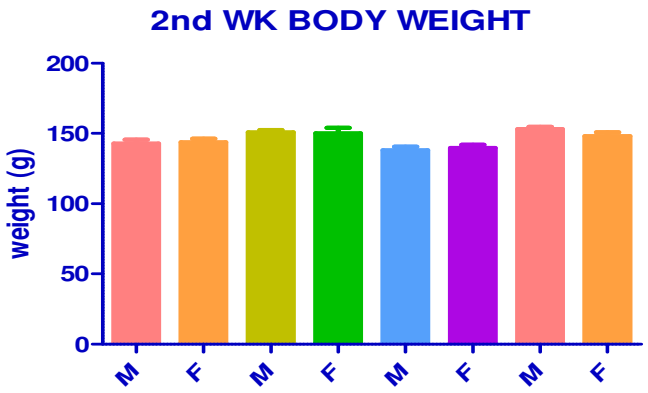
GROUP	CONTROL	LOW DOSE 300mg/kg	MIDDLE DOSE 600mg/kg	HIGH DOSE 900mg/kg
Total cholesterol (mg/dl)	29.8±1.674	41.73±0.6064**	37±3.58	35.13±0.7796
Triglycerides (mg/dl)	91.6±0.6928	66.4±3.291**	64.1±0.866***	65.3±5.138***
HDL-Cholesterol (mg/dl)	7.75±0.2598	6.25±0.5485	5.9±0.5774	5±0.2309

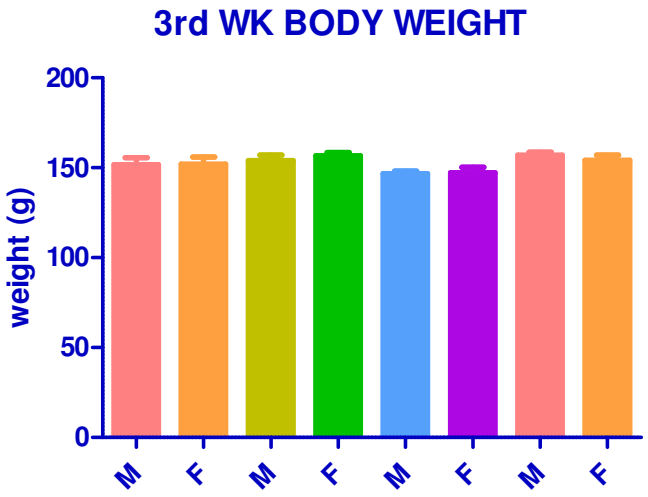
Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); NS- non significant, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.

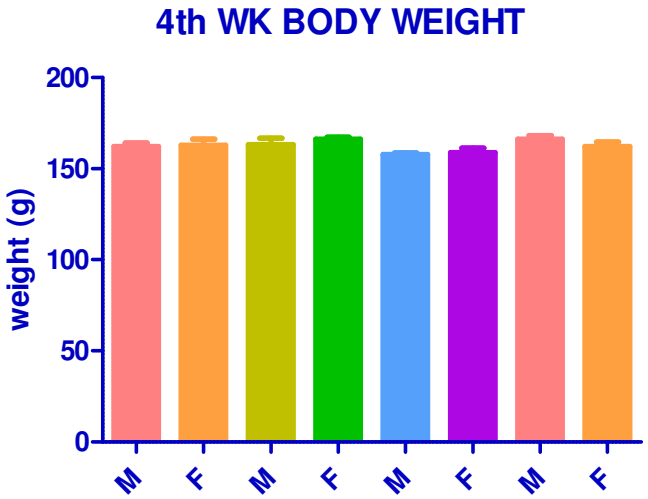



TG
100
80
60
40
20
0
mg/dl
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE


HDL- Cholestrol
10
8
6
4
2
0
mg/dl
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE


2nd WK BODY WEIGHT
weight (g)
200
150
100
50
0
M
F
M
F
M
F
M
F


3rd WK BODY WEIGHT
weight (g)
200
150
100
50
0
M
F
M
F
M
F
M
F

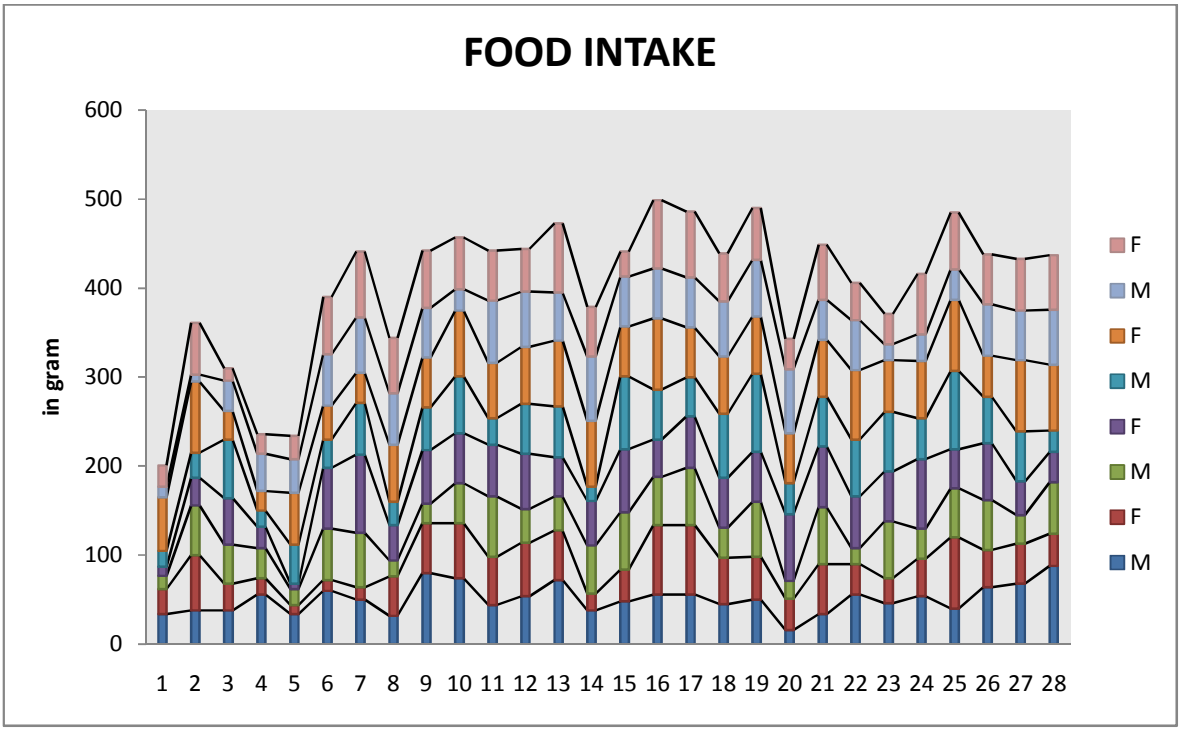

4th WK BODY WEIGHT
weight (g)
200
150
100
50
0
M
F
M
F
M
F
M
F

EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON FOOD INTAKE In Gram

Groups	Control		Low Dose		Middle Dose		High Dose	
DAY	Male	Female	Male	Female	Male	Female	Male	Female
Day 1	34	28	15	10	18	60	12	24
DAY2	38	62	56	31	28	80	8	58
DAY3	38	30	44	52	66	32	34	14
Day 4	56	18	34	24	18	22	42	22
DAY5	34	10	18	6	44	58	38	26
Day 6	60	12	58	68	32	38	58	64
DAY7	50	14	61	88	58	34	62	74
DAY8	32	44	18	40	26	64	58	62
Day 9	80	56	22	60	48	56	56	64
DAY10	74	62	45	56	64	74	24	58
Day 11	44	54	68	58	30	62	70	56
DAY12	54	60	38	62	56	64	62	48
DAY13	72	56	38	44	57	74	54	78
Day 14	38	19	54	50	16	74	72	56
DAY15	48	36	64	71	82	56	56	28
Day 16	56	78	54	42	56	80	56	77
DAY17	56	78	64	58	44	56	56	74
DAY18	45	52	34	56	72	64	62	54
Day 19	50	48	62	56	88	64	64	58

DAY20	16	35	20	75	35	56	72	34
DAY21	34	56	64	68	56	64	45	62
Day 22	56	34	18	58	64	78	56	42
DAY23	46	28	64	56	67	58	18	34
DAY24	54	42	34	78	46	64	30	68
Day 25	40	80	55	44	88	80	34	64
DAY26	64	42	56	64	52	46	58	56
DAY27	68	45	32	38	56	80	56	58
DAY28	88	36	58	34	24	74	62	61

Values are expressed as the mean ± S.D

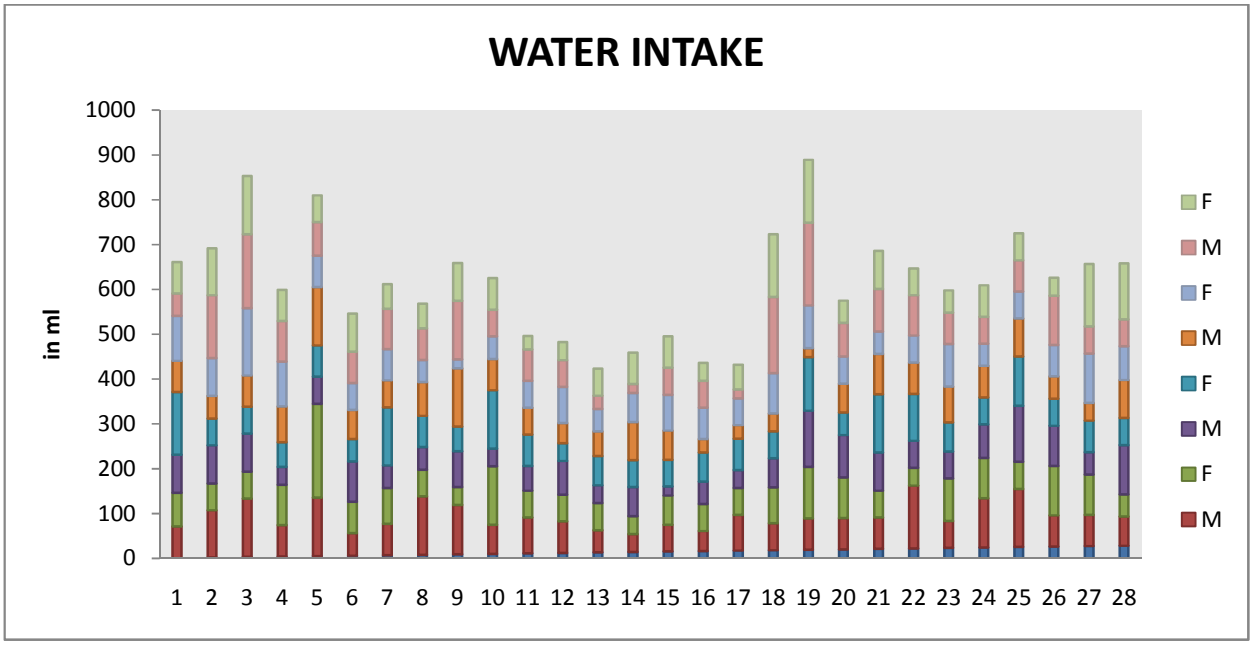


EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON WATER INTAKE IN ml

Groups	Control		Low Dose		Middle Dose		High Dose	
DAY	Male	Female	Male	Female	Male	Female	Male	Female
Day 1	70	75	85	140	70	100	50	70
DAY2	105	60	85	60	50	85	140	105
DAY3	130	60	85	60	70	150	165	130
Day 4	70	90	40	55	80	100	90	70
DAY5	130	210	60	70	130	70	75	60
Day 6	50	70	90	50	65	60	70	85
DAY7	70	80	50	130	60	70	90	55
DAY8	130	60	50	70	75	50	70	55
Day 9	110	40	80	55	130	20	130	85
DAY10	65	130	40	130	70	50	60	70
Day 11	80	60	55	70	60	60	70	30
DAY12	70	60	75	40	45	80	60	40
DAY13	50	60	40	65	55	50	30	60
Day 14	40	40	65	60	85	65	20	70
DAY15	60	65	20	60	65	80	60	70
Day 16	45	60	50	65	30	70	60	40
DAY17	80	60	40	70	30	60	20	55
DAY18	60	80	65	60	40	90	170	140
Day 19	70	115	125	120	20	95	185	140

DAY20	70	90	95	50	65	60	75	50
DAY21	70	60	85	130	90	50	95	85
Day 22	140	40	60	105	70	60	90	60
DAY23	60	95	60	65	80	95	70	50
DAY24	110	90	75	60	70	50	60	70
Day 25	130	60	125	110	85	60	70	60
DAY26	70	110	90	60	50	70	110	40
DAY27	70	90	50	70	40	110	60	140
DAY28	65	50	110	60	85	75	60	125

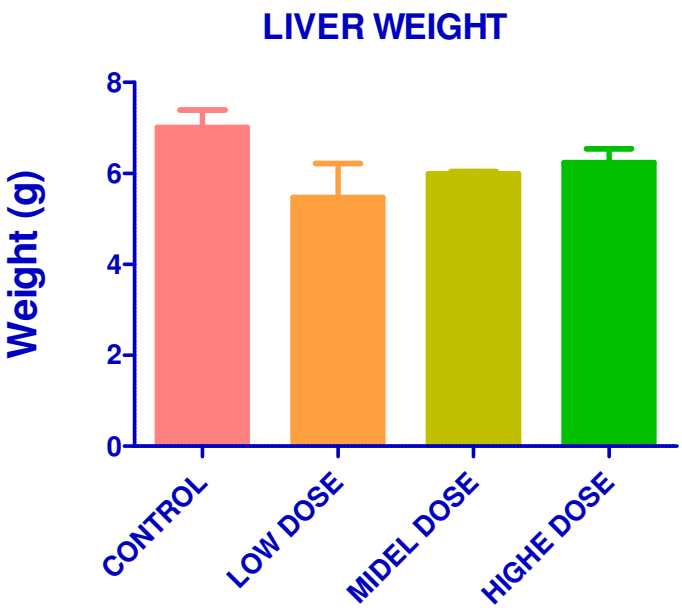
Values are expressed as the mean ± S.D

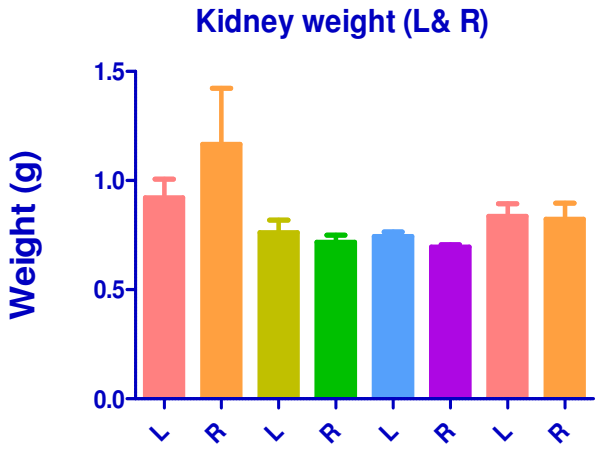


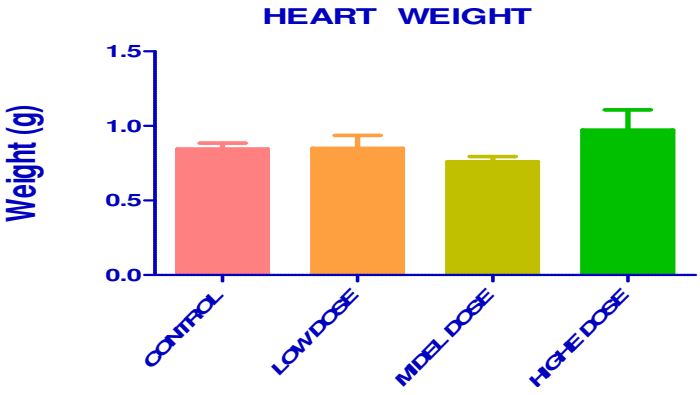
EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON ORGAN WEIGHT in gm

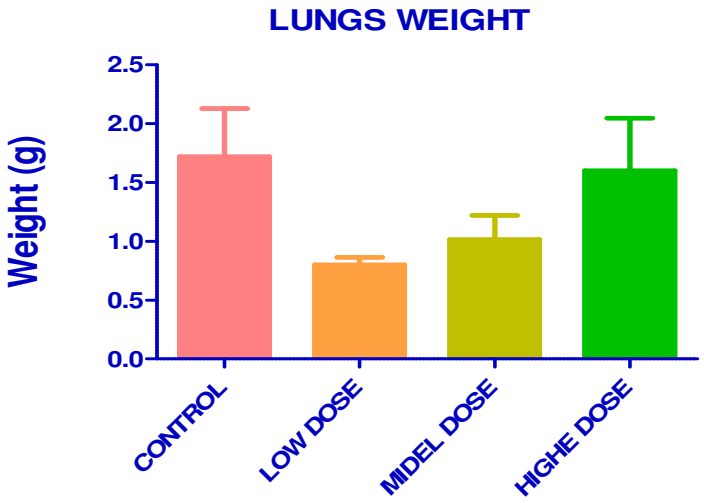
GROUP		CONTROL	Low Dose	Middle Dose	High Dose
LIVER WEIGHT		7.015±0.3805	5.468±0.7463	5.987±0.0561	6.24±0.3043
KIDNEY WEIGHT	L	0.921±0.08582	0.7613±0.05674	0.7443±0.01975	0.8363±0.05655
	R	1.165±0.2567	0.717±0.03279	0.696±0.009074	0.8233±0.07304
HEART WEIGHT		0.8463±0.0393	0.8493±0.08815	0.7603±0.03398	0.972±0.1363
LUNGS WEIGHT		1.721±0.4071	0.8027±0.06003	1.016±0.2056	1.601±0.4463
TESTIS WEIGH		2.841±0.383	2.511±0.3985	2.101±0.3407	2.412±0.4074
UTERUS		0.4477±0.0465	0.463±0.04579	0.4347±0.04944	0.6013±0.1393

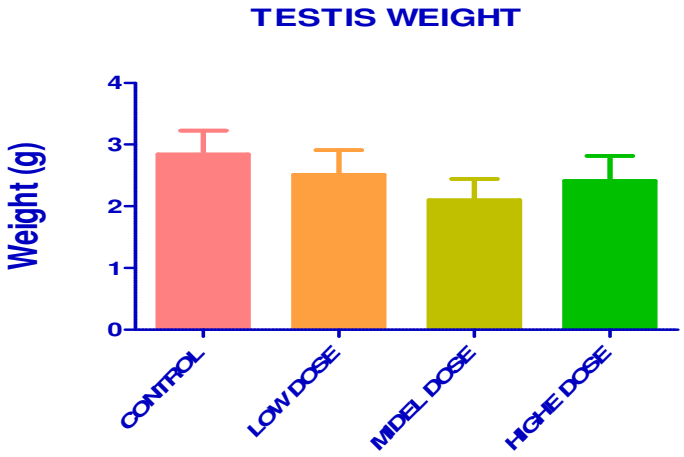
Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.

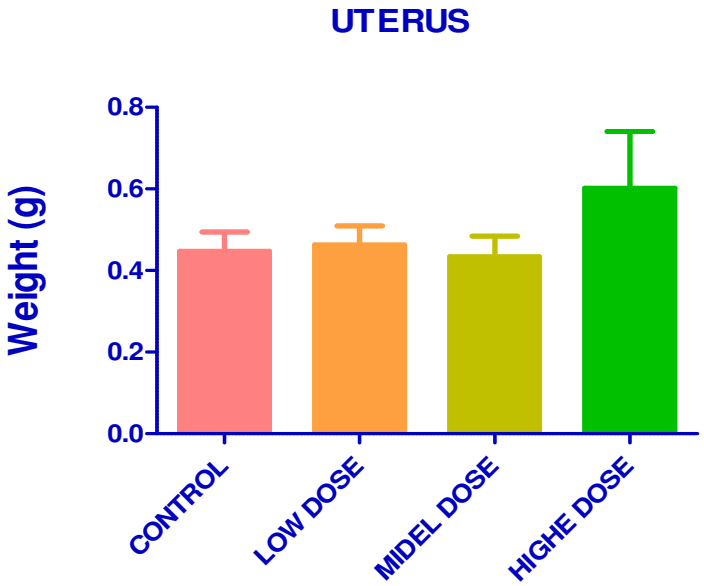

LIVER WEIGHT
Weight (g)
8
6
4
2
0
CONTROL
LOW DOSE
MIDEL DOSE
HIGHE DOSE


Kidney weight (L& R)
Weight (g)
1.5
1.0
0.5
0.0
L
R
L
R
L
R
L
R


HEART WEIGHT
Weight (g)
1.5
1.0
0.5
0.0
CONTROL
LOW DOSE
MIDEL DOSE
HIGHE DOSE


LUNGS WEIGHT
Weight (g)
2.5
2.0
1.5
1.0
0.5
0.0
CONTROL
LOW DOSE
MIDEL DOSE
HIGHE DOSE

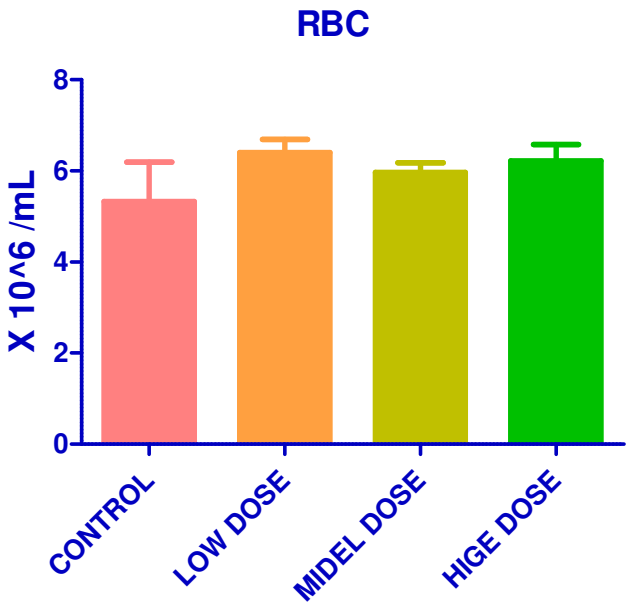

TESTIS WEIGHT
Weight (g)
4
3
2
1
0
CONTROL
LOW DOSE
MIDEL DOSE
HIGHE DOSE

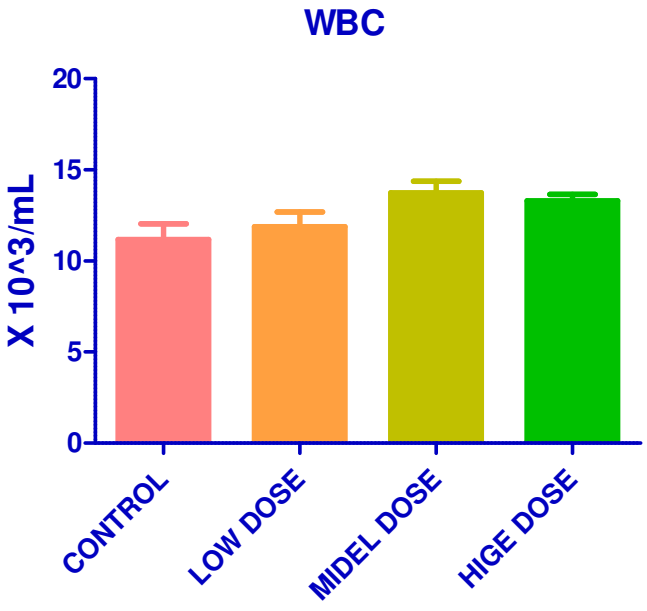

UTERUS
Weight (g)
0.8
0.6
0.4
0.2
0.0
CONTROL
LOW DOSE
MIDEL DOSE
HIGHE DOSE

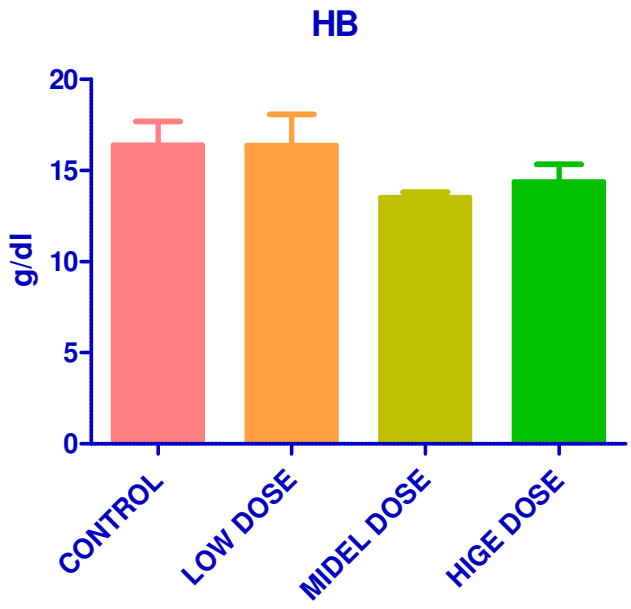
EFFECT OF SUB ACUTE DOSES (28 DAY) 0F VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON HAEMATOLOGICAL PARAMETERS

Groups	Control	Low Dose	Middle Dose	High Dose
Rbc ($X10^3/\mu l$)	5.33±0.8585	6.403±0.289	5.96±0.2173	6.213±0.3619
Wbc($X10^6/\mu l$)	11.17±0.8762	11.87±0.8212	13.73±0.636	13.3±0.3606
Hb (g/dl)	16.4±1.29	16.37±1.707	13.5±0.3055	14.37±0.977

Values are expressed as the mean ± S.D; Statistical significance (p)calculated by one way ANOVA followed by dunnett's ns- no significant $^{*}P< 0.001$, $^{**}P < 0.01$, $^{***}P < 0.05$ calculate by comparing treated group with CONTROL group.



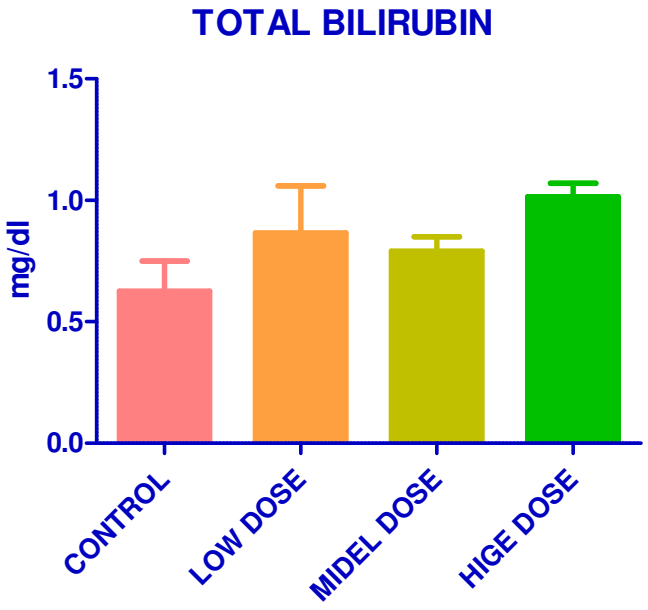

WBC
X 10^3/mL
20
15
10
5
0
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE


HB
g/dl
20
15
10
5
0
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE

EFFECT OF SUB ACUTE DOSES (28 DAY) 0F VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON BIOCHEMICAL PARAMETER (LIVER PROFILE)

Groups	Control	Low Dose	Middle Dose	High Dose
Total Bilirubin(mg/dl)	0.625±0.125	0.865±0.195	0.79±0.06	1.015±0.055

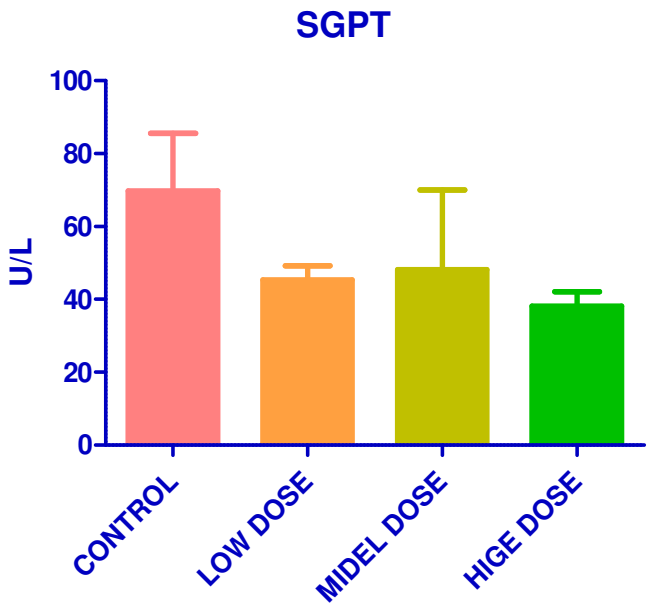
Values are expressed as the mean ± S.D; Statistical significance (p)calculated by one way ANOVA followed by dunnett's ns- no significant $^{*}P< 0.001$, $^{**}P < 0.01$, $^{***}P < 0.05$ calculate by comparing treated group with CONTROL group.

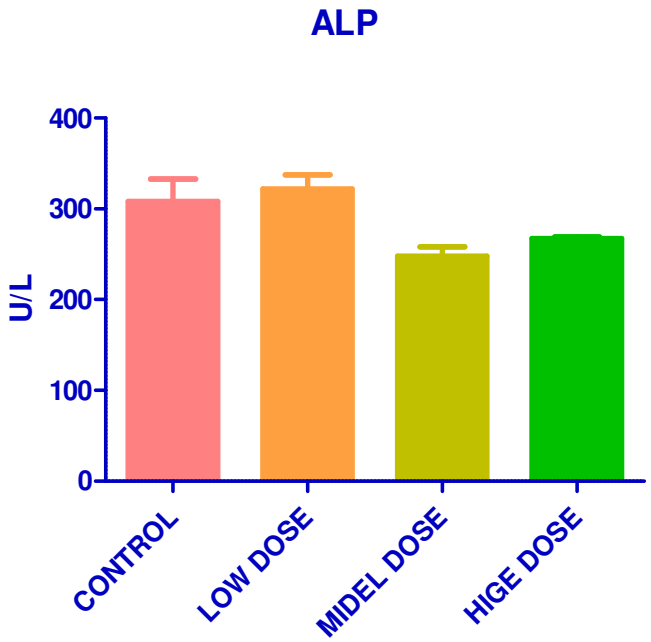


EFFECT OF SUB ACUTE DOSES (28 DAY) 0F VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON BIOCHEMICAL PARAMETER (LIVER PROFILE)

Groups	Control	Low Dose	Middle Dose	High Dose
SGOT (U/L)	85.95±9.25	133.2±37.95	77.9±14.9	81.35±3.05
SGPT (U/L)	69.79±15.72	45.4±3.8	48.15±21.85	38.15±3.95
ALP (U/L)	308.2±24.55	321.8±15.75	247.8±10.55	267.3±1.9

Values are expressed as the mean ± S.D; Statistical significance (p) calculated by one way ANOVA followed by dunnett's ns- no significant $^{*}P< 0.001$, $^{**}P < 0.01$, $^{***}P < 0.05$ calculate by comparing treated group with CONTROL group.

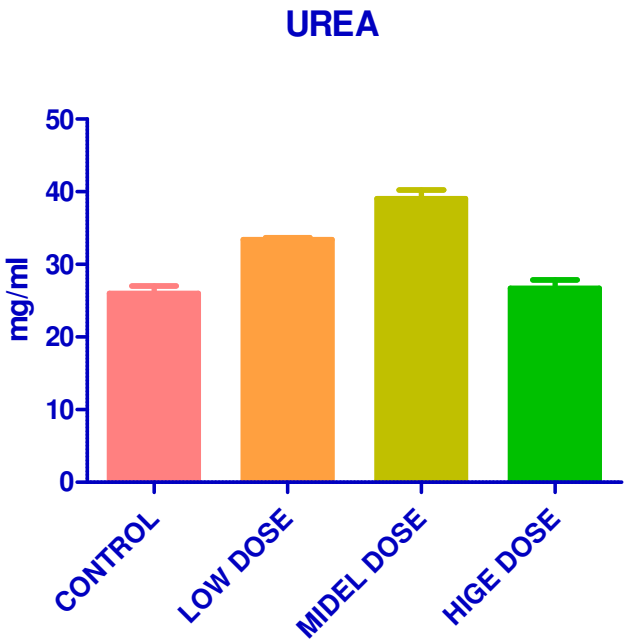

SGPT
100
80
60
40
20
0
U/L
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE


ALP
400
300
200
100
0
U/L
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE

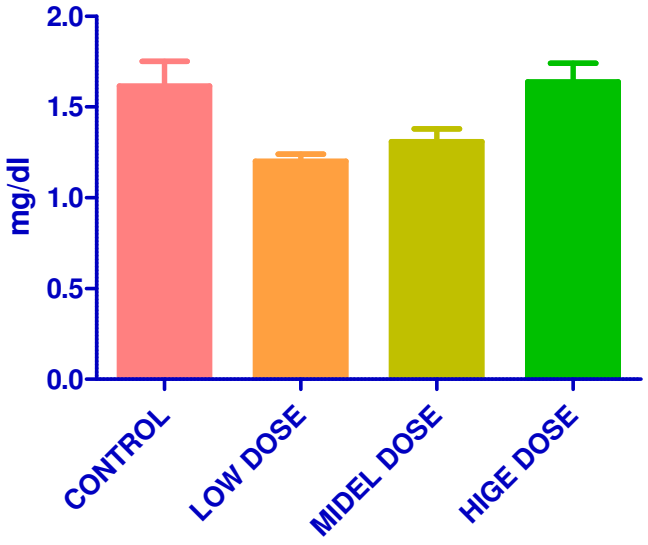
EFFECT OF SUB ACUTE DOSES (28 DAY) 0F VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON BIOCHEMICAL PARAMETER (KIDNEY PROFILE)

Groups	Control	Low Dose	Middle Dose	High Dose
Urea (mg/dl)	26.03±1.01	33.45±0.25	39.08±1.18	26.74±1.13
Uric acid (mg/dl)	1.615±0.135	1.2±0.04	1.31±0.07	1.64±0.1
Creatinine (mg/dl)	0.33±0.05	0.275±0.005	0.23±0.02	0.29±0.09

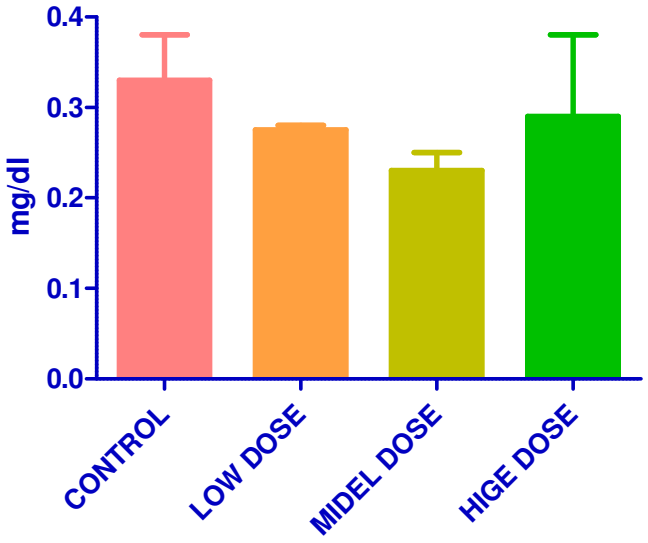
Values are expressed as the mean ± S.D; Statistical significance (p)calculated by one way ANOVA followed by dunnett's ns- no significant $^{*}P< 0.001$, $^{**}P < 0.01$, $^{***}P < 0.05$ calculate by comparing treated group with CONTROL group.



URIC ACID



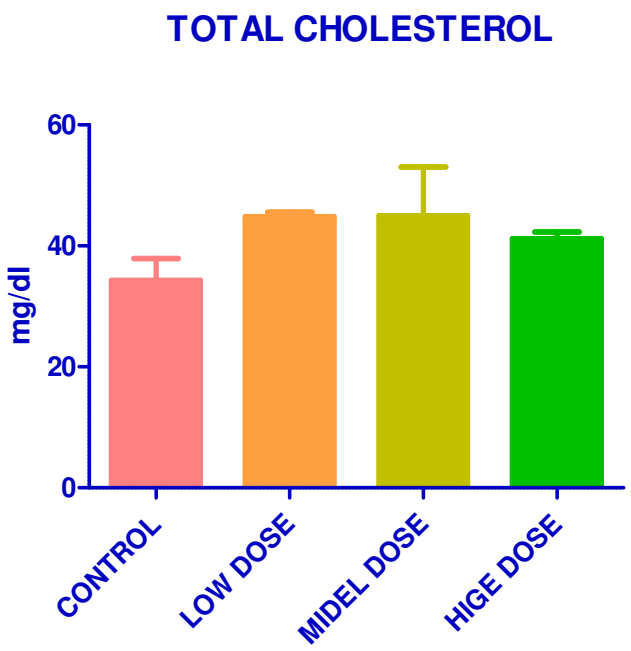
CREATININE

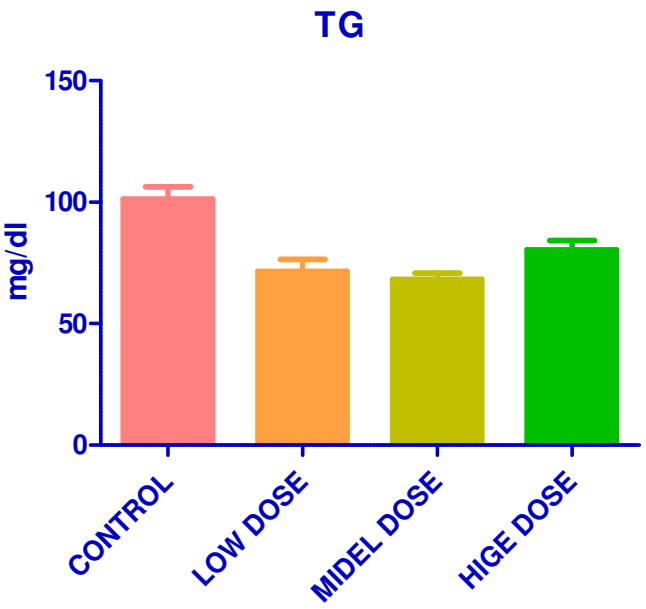


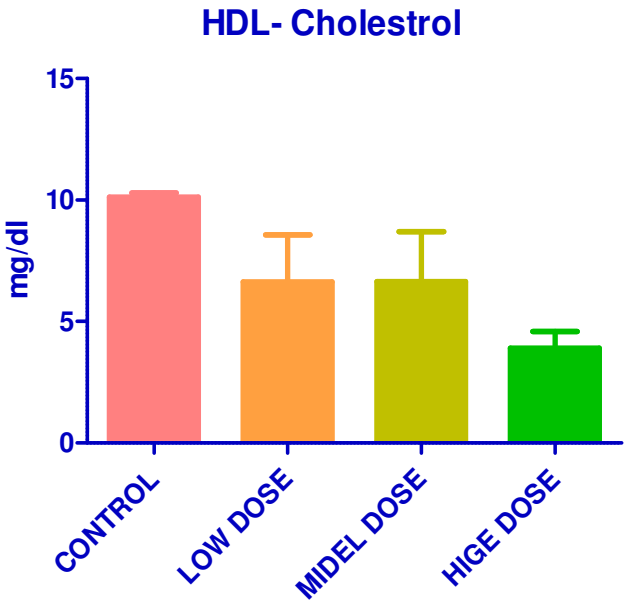
EFFECT OF SUB ACUTE DOSES (28 DAY) 0F VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY ON BIOCHEMICAL PARAMETER (LIPID PROFILE)

Groups	Control	Low Dose	Middle Dose	High Dose
Total cholesterol (mg/dl)	34.3±3.6	44.85±0.75	44.95±8.05	41.2±1.1
Triglycerides (mg/dl)	101.3±5	71.55±4.85	68.28±2.48	80.4±3.8
HDL-Cholesterol (mg/dl)	10.12±0.185	6.625±1.945	6.65±2.05	3.9±0.7

Values are expressed as the mean ± S.D; Statistical significance (p)calculated by one way ANOVA followed by dunnett's ns- no significant $^{*}P< 0.001$, $^{**}P < 0.01$, $^{***}P < 0.05$ calculate by comparing treated group with CONTROL group.




TG
150
100
50
0
mg/dl
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE


HDL- Cholestrol
15
10
5
0
mg/dl
CONTROL
LOW DOSE
MIDEL DOSE
HIGE DOSE

RESULTS:

CLINICAL SIGNS:

All animals in this study were free of toxic clinical signs throughout the dosing period of 28 days.

Mortality:

All animals in control and in all the treated dose groups survived throughout the dosing period of 28 days.

Body weight:

Results of body weight determination of animals Table-1 from control and different dose groups exhibited comparable body weight gain throughout the dosing period of 28 days.

Food consumption:

During dosing and the post-dosing recovery period, the quantity of food consumed by animals from different dose groups was found to be comparable with that by control animals.

Organ Weight:

Group Mean Relative Organ Weights (% of body weight) are recorded in Table No.4 Comparison of organ weights of treated animals with respective control animals on day 29 was found to be comparable similarly.

Hematological investigations:

The results of hematological investigations (Table 4) conducted on day 29 revealed following significant changes in the values of different parameters investigated when compared with those of respective controls; however, the increase or decrease in the values obtained was within normal biological and laboratory limits or the effect was not dose dependent.

Biochemical Investigations:

Results of Biochemical investigations conducted on days 29 and recorded in Table 2 revealed the following significant changes in the values of hepatic serum enzymes studied. When compared with those of respective control. However, the increase or decrease in the values obtained was within normal biological and laboratory limits.

Histopathology:

In histopathological examination, revealed normal architecture in comparison with control and treated animal.

DISCUSSION:

1) All the animals from control and all the treated dose groups up to 500 mg/kg survived throughout the dosing period of 28 days.

2) No signs of toxicity were observed in animals from different dose groups during the dosing period of 28 days.

3) Animals from all the treated dose groups exhibited comparable body weight gain with that of controls throughout the dosing period of 28 days.

4) Food consumption of control and treated animals was found to be comparable throughout the dosing period of 28 days

5) Haematological analysis conducted at the end of the dosing period on day 29, revealed no abnormalities attributable to the treatment.

6) Biochemical analysis conducted at the end of the dosing period on day 29 no abnormalities attributable to the treatment.

7) Organ weight data of animals sacrificed at the end of the dosing period was found to be comparable with that of respective controls.

8) Histopathological examination revealed normal architecture in comparison with control and treated animal.

SUMMARY AND CONCLUSION:

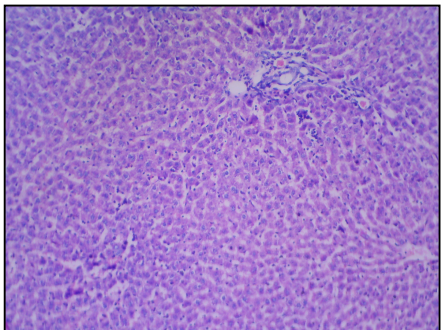
In conclusion **VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY** can be considered safe, as it did not cause either any lethality or adverse changes with general behavior of rats and also there were no observable detrimental effects (100 to 300 mg/kg body weight) over a period of 28 days. Our results have demonstrated that the **VISHNU CHAKRA MATHIRAI WITH INJI JUICE AND HONEY** is relatively safe when administered orally in rats.

9.0 ABBREVATION

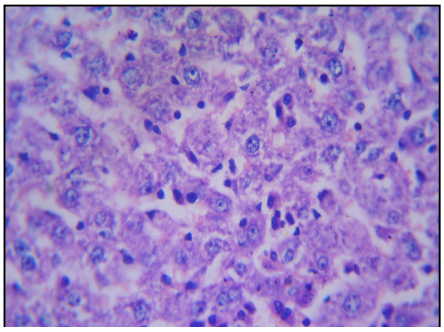
No.	Number
Mg	Milligram
Kg	Kilogram
LD_{50}	Lethal Dose $_{50}$
p.o.	peros
mL	Milliliter
%	percentage
R&D	Research and Development
EDTA	Ethylene Diamine Tetra Acetic Acid
M	Male
g%	Gram percentage
g	Gram
NOAEL	No-Observed-Adverse-Effect-Level
MLD	Minimum Lethal Dose
MTD	Maximum Tolerated Dose
OECD	Organisation of Economic Co-operation and Development
CPCSEA	Committee for the Purpose of Control and Supervision of Experiments on Animals

HISTOPATHOLOGY - TOXICITY STUDY

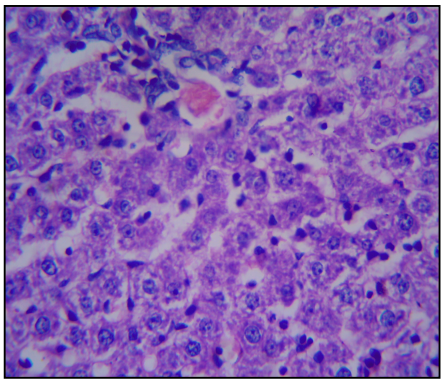
SPECIMEN : A) Liver. Group – : Vishnu chakra mathirai .



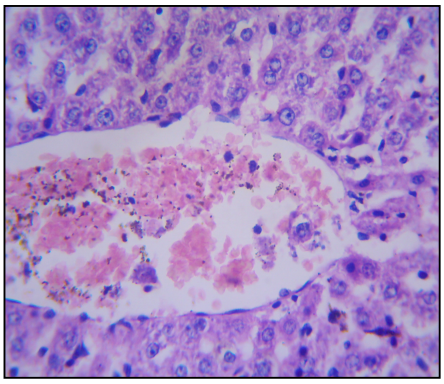
10x shows mild altered architecture with peripotal inflammation



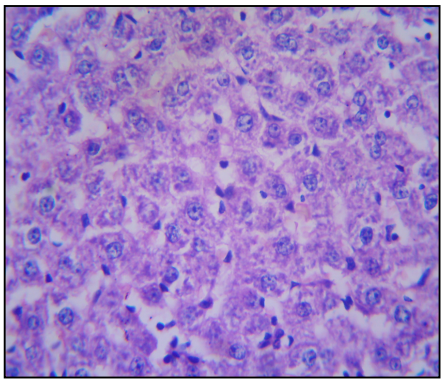
40x show kupffer cell hyperplasia



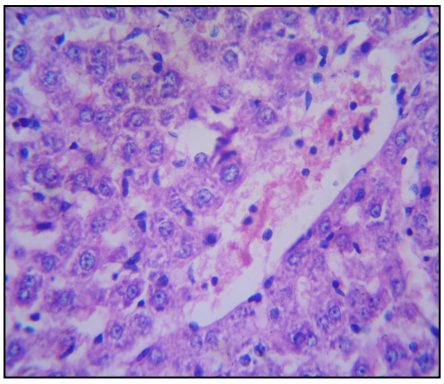
40x shows bile uct hyperplasa



40x shows central vein congestion



40x shows hepatocytic necrosis with sinusoidal dilatation



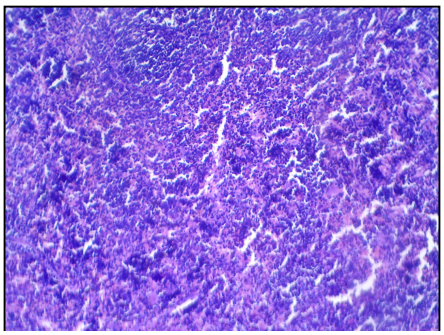
40x shows sinusoidal dilatation and central vein congestion

MICROSCOPIC APPEARANCE:

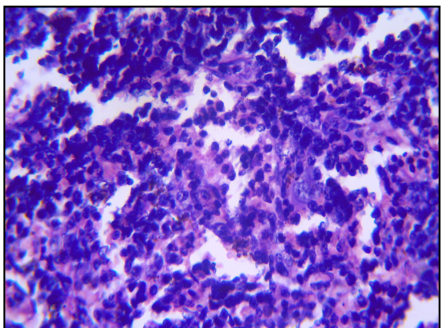
Section from liver shows lobular architecture with interface hepatitis. Individual Hepatocytes shows reactive atypia. Portal triad shows no significant pathology. Central vein and Sinusoids show dilatation.

SPECIMEN : B) spleen.

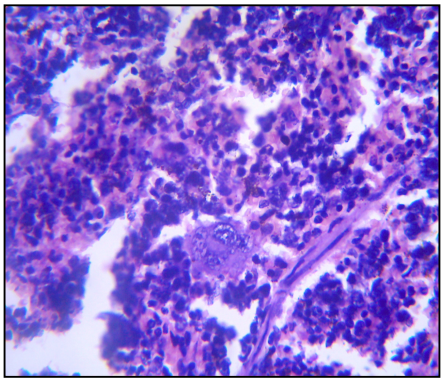
Group – : Vishnu chakra mathirai



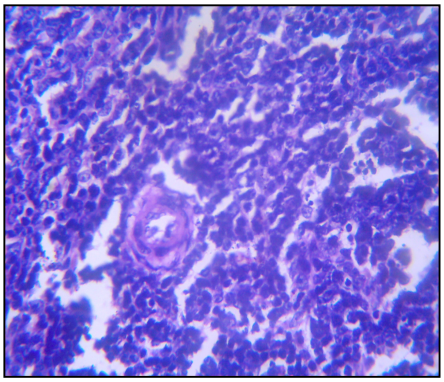
10x shows normal spleen with red and white pulp



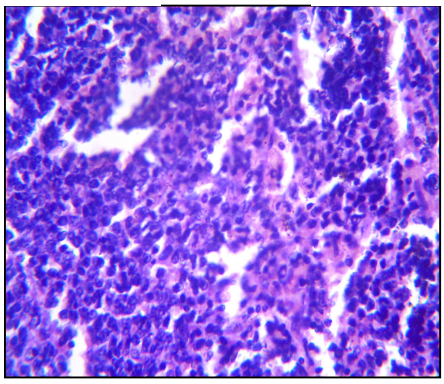
40 x show slymphocytic infiltrates



40x shows megakaryocytes



40x shows pencillar artery



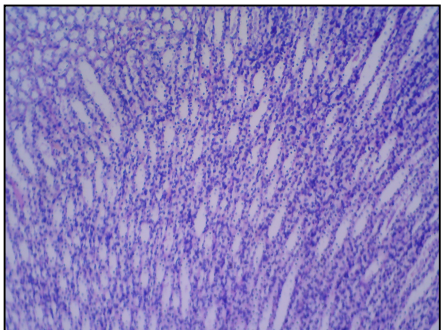
40x shows white pulp with lymp[hocytic infiltrates

MICROSCOPIC APPEARANCE:

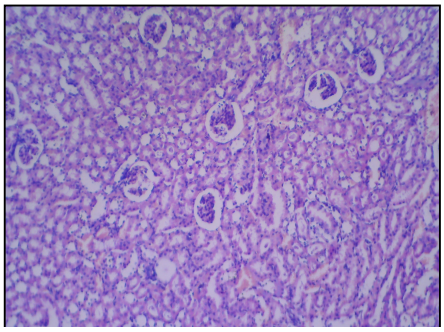
Section studied from spleen shows normal white pulp and red pulp. Red pulp shows pigment laden macrophages and congested vessels. White pulp shows lymphocytic infiltrates forming germinal centre. The pencillar artery shows normal morphology. Megakaryocytes

SPECIMEN : C) Kidney.

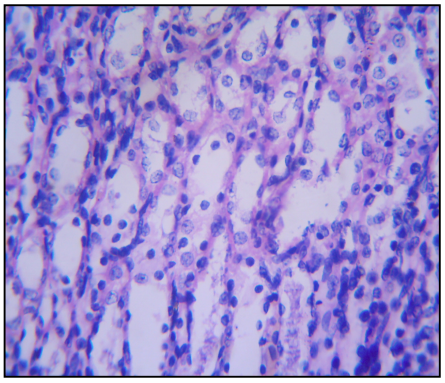
Group – : Vishnu chakra mathirai



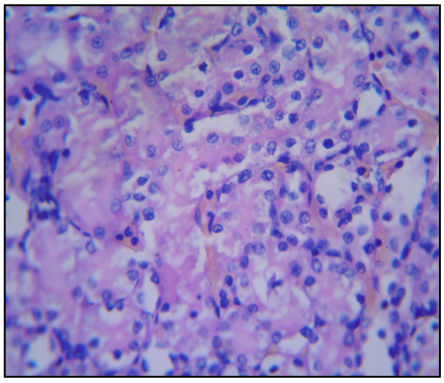
10x shows normal interstitium



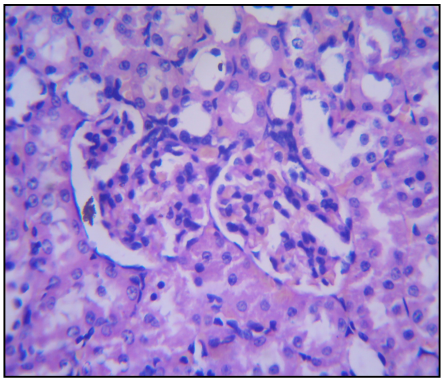
10x shows normal kidney with cortex and medulla



40x shows interstitium



40x shows normal tubules



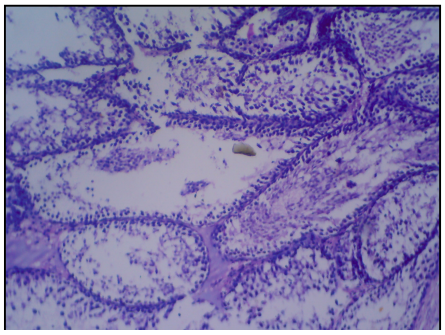
40xc shows normal glomeruli

MICROSCOPIC APPEARANCE:

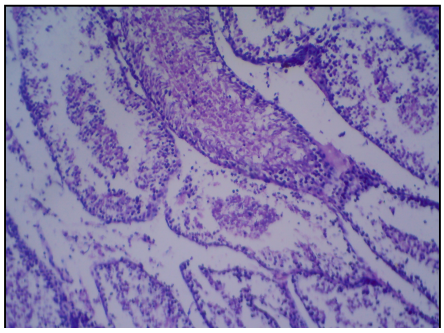
Section from kidney shows both cortex and medulla. Glomeruli and tubules shows no significant pathology. Interstitium shows no significant pathology. Blood vessels show congestion. There is no evidence of toxic changes.

SPECIMEN : D) Testis

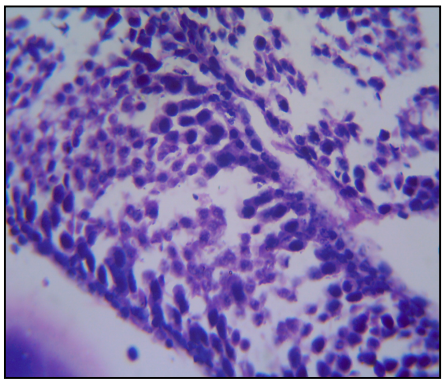
Group – : Vishnu chakra mathirai



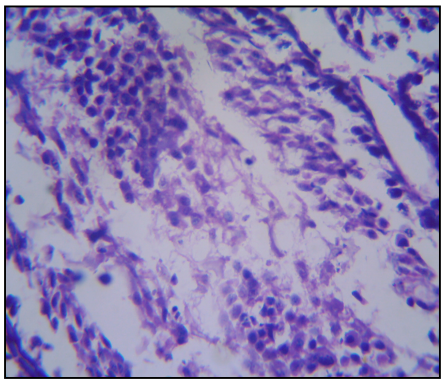
10x shows focal maturation arrest



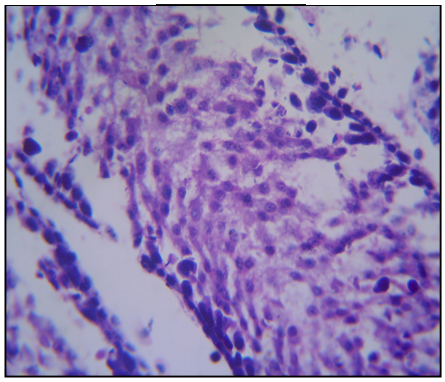
10x shows variying stages of maturation with focal maturation arrest



40x shows maturation arrest



40x shows spermatogenesis



40x shows normal spermatogenesis

MICROSCOPIC APPEARANCE:

Section from testes with seminiferous tubules showing maturation arrest with lacking of spermatogenesis.

Name : **Ref. No. : [H0 331A/18]**	**Rec.On : 21/03/2018** **Rep.On : 18/04/2018**

HISTOPATHOLOGY

TOXICITY STUDY

SPECIMEN : A) Liver
Group – : Kirubakaran - VCM.

GROSS APPEARANCE:

Received a specimen of liver measuring 3.6x2.5x1.4cms.

(PE): Two bits – One block.

MICROSCOPIC APPEARANCE:

Section from liver shows mild altered lobular architecture with kupffer cell hyperplasia. Individual Hepatocytes shows mild hepatocytic necrosis. Portal triad shows bile duct hyperplasia and periportal inflammation. Central vein shows congestion. Sinusoids show dilatation.

Dr.C.R.Ajeethkumar.M.D. (Path).

Consultant pathologists:
Dr.S.Kalyani.M.D. (Path), Dr. C.R.Ajeeth kumar.M.D. (Path),

Checked

Name :	Rec.On : 21/03/2018
Ref. No. : [H0 331B/17]	Rep.On : 18/04/2018

HISTOPATHOLOGY

Toxicity study

SPECIMEN **: B) spleen.**

Group –I : Kirubakaran - VCM

GROSS APPEARANCE:

Received a specimen of spleen measuring 2.0x0.6x0.5cms.

(PE): Two bits – One block.

MICROSCOPIC APPEARANCE:

Section studied from spleen with white pulp and red pulp shows normal morphology. The pencillar artery shows normal morphology. Megakaryocytes are also seen. There is no evidence of toxic changes.

Dr.C.R.Ajeeth kumar. M.D. (Path),

Consultant pathologists:
Dr.S.Kalyani.M.D. (Path), Dr. C.R.Ajeeth kumar.M.D. (Path),

Checked

Name :	Rec.On : 21/03/2018
Ref. No. : [Ho 331C/18]	Rep.On : 18/04/2018

HISTOPATHOLOGY

Toxicity study

SPECIMEN : **C) Kidney**.

Group – I : Kirubakaran - VCM

GROSS APPEARANCE :

Received specimen of kidneys each measuring 1.4x0.7x0.5cms and 1.3x0.6x0.5cms.

PE : Two bits – One block.

MICROSCOPIC APPEARANCE:

Section from kidney shows both cortex and medulla. Glomeruli and tubules shows no significant pathology. Interstitium shows no significant pathology. Blood vessels show congestion. There is no evidence of toxic changes.

Dr. C.R.Ajeeth kumar.M.D. (Path).

Consultant pathologists:
Dr.S.Kalyani.M.D. (Path), Dr. C.R.Ajeeth kumar.M.D. (Path),

Checked

Name :	Rec.On : 21/03/2018
Ref. No. : [Ho 331D/18]	Rep.On : 18/04/2018

HISTOPATHOLOGY

Toxicity study

SPECIMEN : **D) Testis**.

Group – I : Kirubakaran - VCM

GROSS APPEARANCE :

Received specimen of both testis measuring each 1.1x0.5x0.4cms and 1.0x0.5x0.4cms.

PE : Two bits – One block.

MICROSCOPIC APPEARANCE:

Section from testes with seminiferous tubules showing focal maturation arrest with lacking of spermatogenesis.

Dr. C.R.Ajeeth kumar.M.D. (Path).

Consultant pathologists:
Dr.S.Kalyani.M.D. (Path), Dr. C.R.Ajeeth kumar.M.D. (Path),