A STUDY ON

KALLADAIPPU NOI

Dissertation submitted to

THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY
Chennai - 32

For the partial fulfillment of the requirements
for the degree of

DOCTOR OF MEDICINE (SIDDHA)

BRANCH - I Pothu Maruthuvam

DEPARTMENT OF POTHU MARUTHUVAM

GOVERNMENT SIDDHA MEDICAL COLLEGE

PALAYAMKOTTAI, TIRUNELVELI - 627 002

April - 2013

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

69, Anna Salai, Guindy, Chennai - 32.

DEPARTMENT OF SIDDHA

CERTIFICATE OF PARTICIPATION

This is to certify that Dr. .....K.NAMASIVAYAM.....

has participated as ~~Resource Person~~ / Delegate in the Workshop on

"Research Methodology & Biostatistics" for AYUSH Post Graduates &

Researchers organized by the Dept. of Siddha from 04.07.2011 to 08.07.2011.

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SCREENING COMMITTEE

Candidate Reg. No. 32101006

This is to certify that the dissertation topic KALLADAIPPU (UROLITHIASIS) and the drug ARUVAGAI CHOORANAM have been approved by the screening committee.

S.No	Name	Signature
1.	Prof. Dr.N.CHANDRAMOHAN DOSS, M.D(s) Principal & Chairman	
2.	Prof. Dr. R. THANGAMONEY, M.D(s)	
3.	Dr. A. SUBRAMANIAN, M.D(s)	

(Kindly make sure that the minutes of the meeting duly signed by all the participation are maintained by the college office)

APPLICATION FOR PERMISSION FOR ANIMAL EXPERIMENTS

Application to be submitted to send either to the CPCSEA (Address in Form A) or Institutional Animal Ethics Committee (IAEC).

Part A

1. Name and address of Establishment
   K. M. College of Pharmacy,
   Uthangudi, Melur road,
   Madurai – 625 107

2. Registration number and date of registration
   661/02/c/CPCSEA & 19/07/2002

3. Name, address and registration number of breeder from whom animals acquired (or to be acquired) for experiments mentioned in parts B and C. we are using the inbreed colony animals maintained by the Department Of Pharmacology, K. M. College of Pharmacy, Uthangudi, Madurai.

4. Place where animals are presently kept (or proposed to be kept)
   At animal house under the control of Department of Pharmacology

5. Place where experiment is to be performed.
   At Department of Pharmacology
   K. M. College of Pharmacy,
   Uthangudi, Melur road,
   Madurai – 625 107

6. Date on which experiments is to commence and duration of experiment
   01-05-2012 to 01-11-2012
   Six months

(The appropriate protocol form for the research proposal – Part B in the case of experiments using animals other than non human primates, Part C for the use of non human primates – to be duly filled in, signed and appended to this form)

Signature

Date : 18.06.2012
Place : Madurai

Name and Designation of
Chief Investigator

I. A. E. C. CHAIRMAN
INSTITUTIONAL ANIMAL ETHICAL COMMITTEE
K. M. COLLEGE OF PHARMACY
MADURAI-625 107.

* Applicable only for application to be submitted to CPCSEA

ANNEXURE

Investigator declaration

1. I certify that I have determined that the research proposal herein is not unnecessarily duplicate of previously reported research.
2. I certify that all individuals working on this proposal and experimenting on the animals have been trained in animal handling procedures.
3. For procedures listed under item 11, I certify that I have reviewed the pertinent scientific literature and have found no valid alternative to any procedure described herein which may cause less pain or distress.
4. I will obtain approval from the IAEC / CPCSEA before initiating any significant changes in this study.
5. Certified that performance of experiment will be initiated only up on review and approval of scientific intent by appropriate expert body (institutional scientific advisory committee / funding agency / other body (to be named)
6. Institutional biosafety committee (IBC) certification of review and concurrence will be taken required for studies utilizing DNA agents of human pathogens)
7. I shall maintain all the records as per format (Form D)

Signature

(DR.K.Namasivayam)

Name of Investigator

I. A. E. C. CHAIRMAN
INSTITUTIONAL ANIMAL ETHICAL COMMITTEE
K. M. COLLEGE OF PHARMACY
MADURAI-625 107

(For IAE / CPCSEA usage)

Proposal number	: Dr.K.Namasivayam/32101006/ MD(S)/Ph.D/KMCP/IAEC/33.
Date first received	: 20.05.2012
Date received after modification (if any)	:NA
Date received after second modification (if any)	:NA
Approval date	:10.06.2012
Expiry date	:01.11.2012
Name of IAEC / CPCSEA chairperson	:Dr.N.Chidambaranathan.

Date:10.06.2012

Signature

CPCSEA NOMINEE (M. SWAMY)
INSTITUTIONAL ANIMAL ETHICS COMMITTEE
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CONTENTS

ACKNOWLEDGEMENTS

ACKNOWLEDGEMENT

First I must be very grateful to THE LORD for completing this work sucessfully by HIS immense grace .

I express my profound thanks to the Honourable **Vice-Chancellor,** Tamilnadu M.G.R. Medical University, Chennai for permitting me to do this dissertation work.

My profound thanks are due to the **Commissioner,** Directorate of Indian Medicine and Homeopathy, Chennai for permitting me to do this dissertation.

My sincere thanks to **Dr. N. Chandra Mohan Dhas** M.D (s), Principal, Government Siddha Medical College, Palayamkottai for permitting me to avail the facilities in this institution.

I am thankful to **Dr. S. Soundararajan**, M.D (s), Vice Principal, Government Siddha Medical College, Palayamkottai for his moral support.

My heartful thanks to **Dr. S. Mohan,** M.D (s), Professor and Head, Post Graduate Department of Pothu Maruthuvam for his valuable guidance, suggestions and all the efforts that he provides to me to succeed my endeavour during this study.

I am grateful to **Dr. R. Thangamoney**, M.D (s), the Professor and Head, Department of Pothu Maruthuvam for his support and encouragement for this study.

I express my profound gratitude to **Dr. A. Manoharan,** M.D (s), Reader, Post Graduate Department of Pothu Maruthuvam for his dynamic advice and expert guidance throughout the study period.

I sincerly thank **Dr. S. Justus Antony,** M.D (s), Assistant Lecturer, Post Graduate Department of Pothu Maruthuvam for his friendly guidance, encouragement and valuable suggestions.

I extend my heartful thanks to **Dr. G. Subash Chandran**, M.D (s), Ph.D., Assistant Lecturer, Under Graduate Department of Pothu Maruthuvam, for his generous help and guidance.

I take this opportunity to expressing my profound gratitude and deep regards to eminent anatomist **Dr. A.S.Moni** M.B.B.S., M.Sc. (Anatomy) for the exemplary guidance in the field of anatomy and constant encourgement throughout the study.

I am obliged to **Dr. Gopinath**, M.D (RD). Bharani Scans who was grateful in providing radiological and ultrasongram studies to my patients.

I sincerely thank **Dr. V. Neelakandan,** M.B.B.S., M.D., Professor of Modern Medicine, Govt. Siddha Medical College Palayamkottai for having enriched my knowledge on modern aspects.

My sincere thanks to **Dr. M. Halith Mohamed**, M.Pharm, P.hd Department of pharmacology K.M.College of Pharmacy madurai who investigated the pharmacological actions of the trial medicine.

I extend my gratefulness to **Mrs.M. Alagammal**, M.Sc., Head of the Department of Herbal Botany and Herbal Pharmacognosy, for the help rendered in identification of herbs and drugs.

I express my deep sense of gratitude to Mrs. **N. Naga Prema,** M.Sc, M.Phil., and other staff members of the Department of Biochemistry who helped me in biochemical analysis of the trial medicines.

I would like to express my heartful thanks to **Dr. M. Kalaivanan,** M.Sc, M.Phil., Lecturer, for his technical Guidance and valuable suggestions.

My sincere thanks to **Dr. Athinarayanan,** M.D (s) H.O.D Aruvai Maruthuvam **Dr. Muthukumar,** M.D (s), and **Dr. Balamurugan** M.D (s) for their encouragement and guidance.

I wholeheartedly thank **Mrs. T. Poongodi,** M.Lis., M.Phil., Librarian for her assistance in collection of literatures.

My warm regards and special thanks to my classmates **Dr. S. Sivasubraminam, Dr. J. Jayasheeba**, my sisters - in law **Dr. S. Suba subramonian** M.D.(s) and fellow classmates for their help in various stages of my study.

My heartful thanks to the , staff nurses. pharmacists, lab technicians and attenders for their assistance in my study.

The co-operation rendered by the patients both out patients and in patients of the study is gratefully acknowledged .

I dedicate my success to the **Almighty** for his blessings, my beloved parents, my wife, lovable children and my brother for their everlasting love, support, encouragement and enthusiasm which motivated me to complete this work successfully.

Thanks are also due to **Mr. K. Murugan,** and **Mr. M. Arun** Kasi Graphics, South Bazaar, Palayamkottai for the timely and excellent execution of the dissertation.

I wish to convey my heartful thanks to one and all who have helped me in succeeding in this endeavour.

INTRODUCTION

INTRODUCTION

The Siddha system of Medicine is the ancient medicinal system.in the world. Siddha medicine is the earliest medicine ever documented in the world and the oldest medical system in existence. Siddha system of medicine can be considered as the crown of all the traditional arts of the ancient world owing to its richness and simplicity.

Siddhars are saints who attained Ashtama Siddhis which means eight super natural powers. Siddhis are acquired constant practice of certain yogic disciplines. Through their practices they are believed to have reached stages of insight which enabled them to tune into the powers hidden in various material substances and practices, useful for suffering and ignorant mankind.

Siddhars define health as a perfect state of physical, psychological, social and spiritual well being of an individual. Siddhars were of the concept that a healthy soul can only be developed through a healthy body. So they developed methods and medications that are believed to strengthen their physical body and mind

The human body is a composite of three humours such as vaatham, pittham and kabam and seven thathus such as saram, senneer, oon, kozhluppu, enbu, moolai and sukkilam. According to Siddha medicine various

psychological and physiological functions of the body are attributed to the combination of seven elements. The evenness of humours, body tissues and waste products is studied as health and its imbalance, may leads to disease when the normal equilibrium of the three humours (vaatham, pittham and kabam) is disturbed disease is caused.

The Siddhars classified the disease into 4448 types. One among the diseases which comes under the disorder of the Urinary system or visarka urupugal is KALLADAIPPU NOI. In modern system of medicine, KALLADAIPPU NOI is similarly compared and corelated in modern science as Urolithiasis.

Urinary stone constitutes one of the most common diseases in our country and pain due to Kidney stone is known to be the worst pain compared to any other pain. In India approximately 5-7 million patients suffer from stone disease and atleast 1/1000 of Indian population needs hospitalisation due to Kidney stone disease. 12% shave stone in than life time. 12% of men will suffer from kidney stone by age 70. 5% of women will suffer from kidney stone by age of 70. The problem of Urinary calculi is more common in males than in females. The highest incidence of kidney stone is in 30-45 years of age group and the incidence declines after the age of 50.

The disease of Urinary system is classified into :

1. Neerinai arukkal noigal

2. Neerinai perukkal noigal

In YUGI VAITHIYACHINTHAMANI - 800, Part II, KALLADAIPU NOI comes under Neerinai arukkal noigal. Kidney stones are small solid masses formed when salts and minerals normally found in Urine become solid crystals inside the kidney. The stones are made up of the concentrate of substances usually found in Urine. The size of the stones may vary from sand / gravel to the size of a bird's egg.

Several drugs are available for treating KALLADAIPPU NOI in Siddha medicine system. It is evident from Siddha literature that therapeutic value of several drugs have been proved. However, clinical trials on the treatment of KALLADAIPPU NOI have not yet been undertaken for the medicine ARUVAGAI CHOORANAM (internal) mentioned in the text Brahmamuni vaidhya soothiram - 360, Part - I, Page No.120. Hence this Siddha medicine has been chosen for my dissertation work to evaluate its therapeutic values in treating KALLADAIPPU NOI through clinical studies.

AIM AND OBJECTIVES

AIM AND OBJECTIVES

Renal Calculus is one of the most common disorders of the Urinary tract and most painful condition of the Urological disorders. There is no specific internal medicine for Renal Calculus in Modern Medicine. Only surgical procedures are performed to remove stones. Several Siddha literatures deal the origin of the disease and its treatment. Various preventive and curative treatments are found in Siddha literatures. Hence the disease KALLADAIPPU NOI has been taken for the present study and a Siddha medicine such as ARUVAGAI CHOORANAM (internal) has been selected from the literature for evaluating their efficacies in treating KALLADAIPPU NOI.

General objective

To evaluate the efficacy of the trial internal medicine ARUVAGAI CHOORANAM.

Specific objectives

1. To select the KALLADAIPPU NOI patients according to aetiology and clinical features revealed in Siddha literatures and compared with modern science.

2. To investigate Siddha fundamental and modern parameters during and after treatment in all selected patients.

3. To perform Urine analysis, haematological studies and Ultra sonography for all patients.

4. To perform stone analysis in selected cases.

5. To undertake biochemical and microbiological analysis of the trial medicine

6. To evaluate pharmacological actions such as urolithiatic and diuretic activities of the trial medicines.

ABSTRACT

ABSTRACT

Kalladaippu Noi is one of the most common and excruciating painful disease. The symptoms associated with Kallaidappu are renal colicky pain in loin, renal angle and lower abdomen. Pain radiating from loin to groin, thigh and external genetalia, abdominal distention, burning mixturation, anueria, oliguria, concentric urination, haematuria, pyuria, Nausea, Vomiting, fever, chills and sweating. In india approximately 5 to 7 million patients suffering from renal stone disease and atleast 1/1000 of indian population needs hospitalization due to renal calculas diseases. Hence this disease kallaidaippu was choosen for my disseatation work.

The inscriptions mentioned in the siddha literatures about the causes, types, symptoms and therapeutics of kalladaippu noi were informative and impressive.

A drug which correct crystalloid colliod imbalance and relieves the binding mucin of calculi, antispetic, antisposmadic and diuretic, should relax the detrusor muscle of urinary bladder and prevent the super saturation of crystalloid may have the roll in the management of urinary calculi. In siddha texts so many combination of drugs having all these properties are described treating kalladaippu noi. However clinical trials on the treatment of kalladaippu noi have not been undertaken for the medicine Aruvagai

chooranam (Internal) Brahmmamuni vaidya soothiram - 390, Part -I Page no.120. Hence these medicine has been choosen for the dissertation work to evaluate the therapeutic value in treating Kalladaippu noi in clinical study.

The disease was diagnosed by following various siddha diagnostic methods like Envagai Thervugal, Mukkutra Verupadugal, Neerkuri and Neikuri and Modern diagnostic methods that included laboratory, radiological and sonological investigations. A total of 40 patients of either sex (20 OP and 20 IP) were selected and administered with the following trial medicine at PG Department of Pothu Maruthuvam,Government Siddha Medical College and Hospital, Palayamkottai as below:

Aruvagai Chooranam - 2 gm BD Morning and Evening with Hot water after food

The trial medicine is analysed biochemically, microbiologically and pharmacologically. The biochemical analysis of trial medicine revealed the presence of various types of minerals and the microbiological analysis revealed the antibacterial Activity of the trial medicine. The pharmacological study revealed the litho triptic, diuretic and anti-spasmodic effect of the trial medicine. Ultra sonographic investigations were carried out for all the patients before the treatment to confirm the diagnosis of kalladaippu noi, revealed clinically, pathologically, biochemically and through microscopic examination. USG investigations done at the end of the treatment revealed good response of

the trial medicines in treating Kalladaippu noi in 80 % of OP and 65% of IP and moderate response in 15% of OP and 35% of IP. Hence, it can be concluded that the trial medicine, **Aruvagai Chooranam** (Internal) is highly effective and economically viable in curing Kalladaippu noi.

REVIEW OF LITERATURES

A. SIDDHA ASPECTS

REVIEW OF LITERATURES

SIDDHA ASPECTS

The Siddha system of medicine is considered to be the ancient traditional medicinal system in the world. Siddha literatures classified 4448 various diseases, that include aetiology, diagnosis, treatment, medicines, diet and prevention. Among the various diseases, 'Kalladaippu Noi" is one of the most common disease in India. Several preventive and curative treatments are found in various siddha literatures for Kalladaippu noi. The most prominent and ancient siddha literature is "Yugi Vaithya Chinthamani -800".

The Kalladaippu noi is one among the 'Neerinai Arukkal Noikal' which is an evident from the following poem mentioned in the ancient siddha literature, "Theran Karisal"

"நீரிரு வினைக் குணத்தை
நீயறி விரித்துச் சொல்வாம்
நீரினைப் பெருக்கலொன்றே
நீரினை யருக்க லொன்றே
நீரிழிவுடனே கொல்லும்
நீர்க்கட்டு வினைகளொன்று"

– தேரன் கரிசல்

நோய்நாடல் நோய்முதல்நாடல்–2ம்பாகம்,பக்.420

1. Verupeyar (Synonyms)

Ashmari Rogam

2. Eyal (Definition)

The Kalladaippu noi has been defined differently by various authors.

i) In “Agathiyar Gunavagadam”, Kalladaippu noi is defined as below:

“தானென்ற மூத்திரத்தில் நறநறவென்று
தங்கியதோர் பொடியெனும் மணல்தானப்பா
வானென்ற சிறியதொரு கல்லாவதப்பா
வளமாக வந்துவிழும் நோய்க்குத் தானே
ஏனென்ற **அஸ்மரி ரோகமென்ற** பேராம்
எளிதாகக் கல்லுகள்தான் விழுகும்போது
கோனென்ற குண்டிக்காய் மூத்திரக்குழலப்பா
குணமான மூத்திரப்பை நீர்தாரைக் கேளே“
“கேளடா முன்குறியில் எரிச்சல் கண்டு
கெடியாக வேதனைகள் காட்டுமப்பா
வாளடா சிறியதொரு கற்கள்தானே
வளமான மூத்திரப்பை குழல் வழிப்படியாய்த்
தேளடா வரும்போது திரேகந்தன்னில்
தெரிப்பதுபோல யிருவேதனை செய்யும்பாரு
நாளடா கற்கள்தா னிறங்கிவிட்டால்
நலமான வேதனைகள்தான் தீரும்பாரே”.

– அகத்தியர் குணவாகடம்

The above poem written by Agathiyar, defines Kalladaippu noi as "deposition of sand-like grains in urine, which results in formation of small size stones, followed by expulsion of stones along with urine". Further, he explained that the stones obstruct in the kidney, ureter, urinary bladder and urethra. When the stones pass from kidney to ureter, agonizing pain starts and intensifies. While stones reaching the urethral orifice, intense burning sensation in glanspenis occurs. Then the stones get expelled and pain is relieved.

ii) *In* "T.V.Sambasivam Pillai Agarathi", Kalladaippu noi is defined as*:* Large concentration of stone in the bladder or kidney produces calculus or gravel. It causes difficutly in passing urine.

iii) In Siddha Maruthuvam, Kalladaippu noi is defined as*:* Sudden obstruction of flow of urine during micturation, pain in the tip of the penis in male and clitoris in female, burning sensation in urethral orifice, pain radiating from loin to groin, presence of sand-like stones in the urine are the cardinal symptoms of this disease.

iv) Roga Nirnaya Saaram under Roga nithanam, Kalladaippu noi is defined as: Pain in and around the umbilicus, dysuria, urine odours like goat's urine, fever, chills and anorexia are common features of this disease.

Noi varum vazhi (Aetiology)

The causes of the disease mentioned in various siddha literature are as follows.

“தெளிந்ததோர் கல்லடைப்பு உற்பத்தி கேளாய்
சிறிதுநாட் டொடங்கியே மேகந் தன்னில்
தளிந்ததோர் சலப்பையி லுதிரந் தோய்ந்து
சந்தசத் தாகவே பருத்துக் கொள்ளும்
வளிந்ததோர் வாதபித்தங் கோபித் தக்கால்
வந்துபெருங் கல்லாய்நீர் வழிய டைத்து
நளிந்தோர் நாலுவிதக் **கல்ல டைப்பு**
நண்பான வரலாறு நாட்டக் கேளே” பா.725, பக்-283

“கலங்கினதோர் தண்ணீர்தான் குடித்த பேர்க்குங்
கல்லெலும்பு மயிர்மண்தான் கலந்தன் னத்தில்
அலங்கினதோ ரன்னக ளருந்த லாலும்
அழுகலோடு மூத்தபண்ட மருந்த லாலும்
மலங்கினதோர் மாப்பண்ட மருந்த லாலும்
மந்தத்தில் வாய்வான பதார்த்தந் தன்னை
துலங்கினதோர் ருசிதன்னிற் சுவைத்த லாலும்
சுருக்காய்க்**கல் லடைப்பு**வந்து தோன்றுந் தானே” பா.727, பக்.284

– யூகி லைத்திய சிந்தாமணி–800

The above mentioned poems reveal that in the patient suffering from chronic mega noi, the semen stagnates in the urinary tract for a long time, leading to the obstruction of the tract. This condition results in the deposition of urine constituents and formation of stones in the urinary tract. In mean while, due to the increased vatham and pitham, the small stones become large in size and obstruct the urinary passage. The formation of urinary stones is

also attributed to the drinking contaminated, hard water, consuming food adultered with sand and small stones, contaminated food, starchy food and unhealthy food habits etc.

“நீரினை தடுத்தல் செய்யின்
நீர்க்கட்டுத் துவாரம் புண்ணாம்
பாறிடுஞ் சந்து சந்தில்
பண்புறு நோவ தாகும்
நேரிலங் கயருங் காமியம்
நிச்சய நோதல் செய்யும்
பாரினி லபான வாயு
பண்புறச் சேரு மன்றே”.

– சித்த மருத்துவாங்கச் சுருக்கம், பக்.198

It is inferred from the above poem that when urine is ceased deliberately, obstruction of urine flow, sores in the urethral orifice, arthralgia, pain in the glanspenis, increased Abaana vayu in the abdomen will result in.

“சுக்கலந் தனைய டக்கின்
சுரமுட னீர்க்கட் டாகும்
பக்கமாங் கைகால் சந்து
பாரநோய் வழியிறங்கும்
மிக்கமார் நோயுண்டாகும்
மிகுந்திடும் பிரமே கந்தான்
தக்க தோர் போதுமாகின்
தரித்திடும் வாயுக்கூ றே”.

சித்த மருத்துவாங்கச் சுருக்கம்.பக்.212

As per the nature of the body of human beings, semen needs to be discharged regularly. In this regard, the above said poem emphasizes that delibrate ceasation of seminial discharge results in fever, lumbar pain, oliguria, chest pain, arthralgia and white discharge.

Pothu kuri Kunangal

The common symptoms of Kalladaippu noi include

(i) Frequent urination,

(ii) Suddent obstruction of urine flow,

(iii) Excruciating pain in the glans penis and anus,

(iv) Sometimes, when the stone attempts to expel by rolling down, it may not be able to expel due to obstruction either in urethra or in the urethral orifice. This condition will result in agonizing pain and swelling in the Genito-urinary tract.

(v) When the stones are rough and irregular with sharp projections burning sensation and pain will occur in the lower abdomen and urethral orifice. Somtimes it may lead to haematuria.

Noi naadal noi mudal nadal Vol-II. P.427

Syndromes associated with Kalladaippu noi

உக்காரச்சூலை

குத்து முத்காரசூலை யின்கு ணந்தான்
கோர்வையாய் விலாவுதனில் முதுகில் நெஞ்சில்
அத்தி யினில் நாபியில பானமாங்கு தத்தில்
அதிக துன்மாங்கிசந்தான் வளர்ந்து மேவிப்
பத்துமணற் படுக்கைப்போற் சலத்து வாரப்
பதிநெருக்கி மூத்திரமாங் கிரிச்சி யுண்டாய்த்
தத்துசடங் கடுப்பெடுத்து மதிக லங்கித்
தளர்ச்சி யொடுமயக்கமாகத் தள்ளுந் தானே"

யூகி லைத்திய சிந்தாமணி-800-பா.233, பக்.88

This poem reveal that the symptoms of kalladaippu noi include, unwanted proliferation of cells in chest, intercostal region, back of trunk, umbilicus, anus and urethral orifice, followed by stricture of urethral orifice by sand-like crystals, block in the urethra. In addition, dysuria, body pain, impairment of consciousness, tiredness and guiddiness also occur.

Classification

There are several types of kidney stones (Urolithiasis). In the siddha books, it is evident from various literatures written by siddhars. Some of them are given below.

A. In yugi vaidhya chinthamani-800

"தோன்றிடதோர் நாலினிட நாமங் கேளாய்

சுறுக்கான வாதத்தின் கல்ல டைப்பு

பூன்றியதோர் பித்தத்தின் கல்ல டைப்பு

புரண்டதோர் சிலேட்டுமத்தின் கல்ல டைப்பு

தீன்றியதோர் தொந்தமாங் கல்ல டைப்பு

தேகத்தைப் பற்றியே சிறிது காலம்

தான்றியே சலப்பையில் வந்தி ழிந்து

சருவியே லிங்கத்திற் றரிக்குந் தானே" பா.728, பக்.284

The above poem mentioned in the Yugi Vaidhya Chinthamani-800, classifies Kalladaippu noi in to four types. They are,

i . Vali kalladaippu

ii. Azhal kalladaippu

iii. lyya kalladaippu

iv. Mukkutra kalladaippu

i. Vali kalladaippu

"தரித்து நாபிக்குங் சுருக்காய் குற்றிச்

சலமலந்தான் வீழாமற் றம்ப மாகி

வரித்துமே லிங்கத்தில் வலியு மாகி

மருவியதோர் பொத்தியெலாஞ் சுரந்து கட்டி

திரித்தியே கிடைக்கொடாப் பிரட்டலாகித்

தேம்பியே மூச்சுமாய் வயிறு முப்பும்

உரித்ததோர் சதைபோல உவர்ப்பு மாகும்

ஓங்குகியதோர் வாதக்கல்ல டைப்பு தானே". பா.729, பக்.284

This poem clearly states that in Vali kalladaippu, patients suffer from acute pricking pain in the lower abdomen, scanty micturation, obstruction of urine flow, pain in the glans penis making them unable to sit. The other symptoms include pain in abdomen, albuminuria, and mucous discharge. Finally stone gets expelled along with urine.

ii. Azhal kalladaippu

"அடைப்பாகிச் சலந்தானு மருவ லாகி
அயங்காச்சிச் சொருகினாற் போலே காணும்
புடைப்பாகப் பொற்றியெங் கும்பு முக்கமாகிப்
பூட்டுப்போல் பிகுவாகிப் பிரட்ட லாகும்
மடைப்பாகி உதிரநிற மாய்க்கல் லாகி
வந்திழிந்து லிங்கத்தில் மாட்டிக் கொள்ளும்
குடைப்பாகிக் குற்றலாய்க் கூச்ச லாகிக்
குதட்டுமே பித்தக்கல் லடைப்பு தானே". பா.730, பக்.285

It is evident from the above poem that the cardinal features of Azhal kalladiappu include obstruction of urine flow, burning sensation in external meatus, acute pain in the urethra and excretion of small blood pigmented stones.

iii. lyya kalladiappu

"தானா தொப்புளிலே வில்லு போலச்
சலியாமற் சுரந்துமே சற்றே குற்றும்
ஏனான காலோடு கைகள் சந்து
இடுப்புதான் குடைச்சலா யிசிவு காணும்

வேனான லிங்கத்தின் வெண்மை தன்னில்

விறுவிறென் றேகடுப்பாகி வியர்வை யாகும்

தேனான வெளுப்புக்கல் சிறுகல் லாகச்

சிக்கலாய் வந்திறங்குஞ் சேட்பந் தானே". பா.731, பக்.285

This poem clearly mentions that the symptoms of Iyya kalladaippu are acute pain and in around the umbilicus, pain radiating towards thigh, joint pain, burning micturation, profuse sweating and expulsion of small white stones.

iv. Mukkutra kalladaippu

"வந்திறங்கும் நீர்த்தாரை யடியிற் றானும்

மாவருத்த முண்டாகி வலியு மாகி

நொந்திறங்கி நீர்தானு மருவி பாயும்

நொய்தான சிறுமணல் போல் நொறுங்கி கல்லான்

சந்திறங்கி நீர்வழியில் வந்து வீழும்

தாக்கான சிறங்கைக்கல் தினமொன் றுக்கு

துந்திறங்கித் தினந்தினமு மிழந்து கொல்லும்

தொந்தமாங் கல்லடைப்புச் சூட்டிட் டாயே". பா.732, பக்.286

The above poem reveals that the patients ailing from Mukkutra kalladaippu will suffer from the symptoms like severe burning pain in urethral orifice, dysuria, oliguria, expulsion of handful of sand grain like stones with urine every day.

B.In Siddhar Aruvai Maruthuvam

Kalladaippu noi is classified into four types

i. Vali kalladaippu

ii. Azhal kalladaippu

iii. Iyya kalladaippu

iv. Venneer or Manar kalladaippu

C. In Thanvanthiri Vaithyam [II part, Page No. (9,10)]

"திருத்திய வாத பித்தச் சிலேற்பனம் பிரகோபித்தால்
வகுத்தசு மரித்தா நான்கு வகைப்படும் **கல்லரிப்பன்**
பிரிந்திடுஞ் சிலேற்பனாசு மரிபித்தா சுமரி பின்னு
மிருத்திடு சுக்கிலாசு மரிநான்கு மெய்துமென்றே." (1)

The alteration of three dhoshas results in occurrence of the following four types of Ashmari

i. Kallarippan

ii. Pitha Ashmari

iii. Slathma Ashmari

iv. Sukkila Ashmari

i. Kallarippan

"சுத்துநீர் நாளந்தன்னிற் சுக்கிலந்தனிற் சிலேற்பனம்
பித்தமீதுலர்த்தல் கல்லாய்ப் பீசகிநீ ரடைத்துக் கொள்ளுங்
கொத்துநீ ரிற்றுவீழுங் கொப்புள்நோ குடம்பு காயுஞ்
சித்தா யருசி யுண்டாஞ் சேர்ந்த**கல் லெரிப்பனாமே**" (2)

It is learnt from this poem that when kapam and pitham increase, urine and semen dry up, resulting in the formation of stone which in turn lead to obstruction of urinary tract, dysuria, pricking pain in umbilicus, fever and anorexia.

ii. Slathma Ashmari

"நீர் வரு தாளத் தன்னில் நின்றுநீர் சிறுத்துக் கொண்டு
சோர்ந்தரும் சிவப்பு வெண்மை சுக்கிலம் போல வீழும்
பேர்பெற நாலாமெட்டும் பின்னமாய்க் கல்லு வீழும்
ஏர்பெறு சிலேற்பனத்தில் அச்மரி என்னலாமே" (3)

This poem states that when the calculus arrive the urethral orifice, the volume of urine gets reduced gradually, leading to oliguria. Ultimately, the stone is broken into four to eight pieces and pass through the urine.

iii. Pitha Ashmari

"பெய்யும்நீர் நாளத் தன்னில் பித்தத்தா லெரிப் பெழுந்து
செய்யுவுஷ் ணத்தால்வெந்து சேங்கொட்டை போற்கல் லுண்டாம்
நய்யவே தனைகள் செய்யும் நவில் குணம் பித்தந்தன்னில்
எய்தசு மரியென்றேமுன் னியம்பின ரறிவின் மிக்கோர்" (4)

It is evident from this poem that when pitham accumulates in the urethral orifice, severe pain will result in along with burning sensation. This condition will lead to formation of calculus of a size of anocardium.

iv. Sukkila Ashmari

"சுக்கிலம் வருங்காலத்தில் தம்பித்தாற் சுக்கிலந்தான்
மிக்ககல் லாகிவெம்பி விதனமாய் நீர்விடாமற்
சிக்கிநீர் விழா மலங்கே மணல் விழும் வெளுக்குந்தேகம்
மிக்குணஞ் சுக்கிலாசு மரியசாத் தியமென்றோதே" (5)

If semen discharge is caesed it gets concentrated and dried up in the urethra, preventing the flow of urine which results in anuria. Under this condition sand grains like stones pass through the urine and anaemia occur.

D. In Roga Nirnaya Saaram under Roga Nithanam (Page. 79 & 80)

Ashmari Rogam is classified into five types as given below.

i. Vatha Ashmari

ii. Pitha Ashmari

iii. Kapa Ashmari

iv. Sukkila Ashmari

v. Swargara Ashmari (or) Kalladaippu Rogam

i. Vatha Ashmari

Urine turns to black in colour, dribbling, grunting teeth and rubbing of penis.

ii. Pitha Ashmari

Tip of penis turns to black in colour and urine turning to red, white and yellow in colour

iii. Kapa Ashmari

Urine becomes white in colour and highly viscous and flows down like honey.

iv. Sukkila Ashmari

Caesation of seminal discharge during sexual intercourse leads to retention of semen in vas defrens or spermaticcord, which get dried up by vatham. This condition eventually results in inflammation of testis and lower abdominal pain.

v. Swarkara Ashmari (or) Kalladaippu Rogam

Semen is retained in the spermatic region and gets dried up. The dried semen turns to stones of size of sand, green gram, ground nut and get mixed up with urine and pass through the urethral orifice.

E. In Anubhava Deva Ragasiyam I Part (Page no. 131),

Ashmari Rogam is classified into five types.

i. Vatha Ashmari

ii. Pitha Ashmari

iii. Kapa Ashmari

iv. Sukkila Ashmari

v. Swarkara Ashmari or Kalladaippu Rogam

i. Vatha Ashmari

Due to increased vatham, rigor, grunting teeth, rubbing of penis and umbilicus, crying, vomiting, forced excretion of faeces, dysuria and dribbling of black colour urine occur.

ii. Pitha Ashmari

The symptoms include increased temperature in the lower abdomen, flatulence, appearance of glans penis as peal of semicorpus anocardium and urine turning to red, yellow or white in colour.

iii. Kapa Ashmari

The cardinal features are acute pain in the lower abdomen and urine turning to white in colour and highly viscous and flowing down like honey.

iv. Sukkila Ashmari

The symptoms are pain and inflammation in the testis, lower abdominal pain, urine taking a long time to get expelled during urination and pain during micturation.

v. Swarkara Ashmari (or) Kalladaipppu Rogam

The dried semen is crushed by vatham into small stone of various sizes ranging from fine particles of sand or mustard to as large as green gram, or bengal gram and even dates which block the passage of urine. If vatham is in

normal level, stones will be expelled with urine. When vatham is not in normal level, even a drop of urine is not expelled during micturation.

F. In Sikitcha Rathna Deepam - Vaidhya Chinthamani - II part (Page. no.140,141)

Kalladaippu Rogam is classified into following four types.

i. Vatha kalladaippu

ii. Pitha kalladaippu

iii. Slaethuma kalladaippu

iv. Mukkutra kalladaippu

i. Vatha kalladaippu

The symptoms include acute pricking pain in the lower abdomen, obstruction of the flow of urine, scanty micturation, pain in the penis, making the patient unable to sit, crying, flatulence, presence of albumin in the urine and mucous discharge with urine.

ii. Pitha kalladaippu

The symptoms are obstruction of the flow of urine, burning sensation in the urethral orifice (the burning sensation refers to melting point of iron put on the external meatus), acute pain in the urethra and expulsion the small blood stained stones.

iii. Slaethuma kalladaippu

In this kalladaippu, patient suffers from severe pain in the lower abdomen, pain radiating towards the thigh, joint pain associated with rigor and pain in the tip of glans penis. Finally, small white coloured stones are expelled along with urine.

iv. Mukkutra kalladaippu

Pain in urethral orifice, pain during micturation, presence of small sand grain like stones in urine are the cardinal features of Mukkutra kalladaippu.

6. Mukkutra verupadugal (Pathology)

The three uyir thathukkal are formed by combination of

Idakalai + Abaanan - vatham

Pinkalai + Praanan - Pitham

Sulumunai + Samaanan- Kapam

Under normal condition, the three factors tend to be in their states of equilibrium (1:½:¼)

“உற்றதோர் உடலின் கூறு
உறுப்புடன் விரவி நின்று
முற்றுமே நோய்களெல்லா
முதிர்பெறத் தோன்றும் போது
பற்றுமே வாதபித்த

சிலேற்பனந் தன்னிலொன்றை

பற்றியே தோன்றுமென்று

பகர்ந்தனர் முனிவர் தானே”

– அகத்தியர் குருநாடி–பக்–65

As per the siddha principles, the manifestation of any diseases is the result of disturbed kutrams (ie, vatham, pitham, kapam).

முக்குற்ற வேறுபாடுகள்

உணவு, நீர் முதலியவைகளால் வளிக்குற்றமும், தீக்குற்றமும் மிகுந்து உடல் நீரைச் சுண்டச் செய்து, சிறுநீரிலுள்ள உப்பை நீர்க்குண்டிக்காயில் உறையச் செய்து, கீழ்நோக்குக்கால் (அபானன்) வன்மையோடிருந்தால் அக்கற்களை எளிதில் சிறுநீருடன் வெளியேற்றியும், வன்மையற்றிருந்தால் கற்களை அவ்வப்போது வெளியாக்காது அங்கங்கே சிறுநீர் போகும் வழியில் எங்கேனும் தங்கச் செய்து கல்லடைப்பு நோயைப் பிறப்பிக்கும்.

– நோல்நாடல் நோய்முதல்நாடல்–பாகம்2, பக்.–427

“வாயுவினாலே மலசலங் கட்டிடும்

பிரிந்திடும் பித்தம் போராஞ் சலத்தினிலே”

– சித்தமருத்துவஆய்வுச் சுருக்கம், பக்.154

The above poem mentioned in Siddha Maruthuvanga Surukkam emphasizes that alteration in diet, salt and water intake will lead to alteration, mainly increase in vatha and pitha kutram in the body, which in turn result in sedimentation of urine in the kidney. Under this condition, if Abaanan is favourable, these sedimented deposits get expelled with the urine. If it is unfavourable, these deposits do not get expelled with urine. Instead, they get

deposited in the urinary tract, which pave way for the occurrence of this disease.

Functions of Mukkutram

Vatham Pain in the body, twitching pricking pain, inflammation, reddish complexion, dryness of skin, hardness of limbs, astringent sense of taste in the mouth, unpalatable taste, sweating during sleep, traumatic pain, constipation, oliguria, blackish discolouration of skin, stool and urine and muddy conjunctiva.

Pitham Hyperacidity, burning sensation in the stomach, yellowish discolouration of skin, eye, urine, sense of defeacation, profuse sweating, dizziness etc.

Kapam Fair complexion, itching, dullness, cold, heaviness, loss of sensation, sweetness in mouth, indigestion etc.,

Roles of Mukkutram

Abnormal change in these three mukkutram lead to abnormal changes in structure, function and behaviour of various body organs.

Vatham

The term vatham denotes vayu, dryness, pain and flatulence. Based on functions and locations, it is classified into the following ten types. They are

- Piraanan (Uyirkaal)
- Abaanan (Keezh Nokkukaal)

- Viyaanan (Paravukaal)
- Uthaanan (Melnokkukaal)
- Samaanan (Nadukkaal)
- Nagan
- Koorman
- Kirugaran
- Devathathan
- Dhananjeyan

In Kallaidaippu noi, **Abaanan** was affected by increased urine concentration due to stone formation in the urinary pathway which result in the obstruction of the flow of urine, scanty micturation, haematuria (due to sharp edged stones) and dysuria. When **Uthaanan** was affected, nausea and vomiting will occur.

Pitham

It is the thermal life force of the body. It is subdivided into five types. They are,

- Anarpitham
- Ranjaga pitham
- Sathaga pitham
- Pirasaga pitham
- Alosaga pitham

In Kalladaippu noi, **Sathaga pitham** was affected by decrease in urine output due to increased pitham and acidic urine. This condition favours the formation of stones in the urinary pathway.

Kapam

It is responsible for the streamlined functions of the body and maintains body's defence mechanism intact. It is classified into five types as below,

- Avalambagam
- Kilethagam
- Pothagam
- Tharpagam
- Santhigam

In Kalladaippu noi, **Santhigam** was affected, patients will not be able to walk and move the joints (hip and knee joints) freely.

UDAL THATHUKKAL

When the functional elements (vatham, pitham and kapam) are upset, repercussions are felt immediately over the components due to alteration in the nature of somatic components.

1) Saaram (Digestive essence)

It is responsible for the growth and development. It keeps the individual in good temperament and enriches the blood.

In Kalladaippu noi, **Saaram** is affected by change in our food habits, which result in increase in level of Vitamin D and become hypervitaminosis. Increased Vitamin D is a main cause for Kalladaippu noi (Renal calculi).

2) Senneer (Blood)

It is responsible for the colour of blood and for the intellect, nourishment, strength, vigour and valour of the body.

In Kalladaippu noi, **Senneer** is affected. Mean while increased calcium and phosphorus level in the blood may cause Kalladaippu noi.

3) Oon (Muscle)

It gives suitable contour to the body, required for the physical activity. It feed the fat next day and gives a sort of plumpness to the body.

In Kalladaippu noi, **Oon** is affected. When there is a change in the level of vitamins due to change in our food habits. The decrease in vitamin A level may lead to destruction and shrinkage of the mucous membrane in the urinary tract. Sometimes, damaged mucous membrane get mixedup with urine and expelled.

4) Kozhuppu (Fat)

It lubricates the organs to facilitate frictionless function.

5) Enbu (Bones)

It supports and protects the vital organs, bestows a definite structure to the body and is responsible for the posture and movement of the body.

6) Moozhai (Bone marrow, brain)

It nourishes the bone (marrow) and the brain which is the centre that controls every other system of the body.

7) Sukkilam or Suronitham (Sperm & Ovum)

It is responsible for reproduction.

In Kalladaippu noi, Sukkilam is affected by the increased body heat and hence semen in the spermatic region get dired up and shrunken and become small vesicle stones.

நோய் கணிப்பு முறை (DIAGNOSIS AND PROGNOSIS)

In Piniyari Muraimai, the following principles are followed in Siddha system. They are,

1. Poriyaal arithal
2. Pulanaal arithal

3. Vinaathal

The maruthuvar (physician) should observe the patient, palpate and interrogate the patient thoroughly.

Poriyaal arithal and Pulanal arithal

Poriyaal arithal means understanding by the five organs of perception, whereas Pulanaal arithal is the understanding by sensing the objects. They are,

Mei	-	Ooru (Somatic sense)
Vaai	-	Suvai (Taste)
Kan	-	Oli (Vision)
Mookku	-	Natram (Smell)
Sevi	-	Osai (Sound)

Vinaathal (Interrogation)

The first and foremost step in diagnosing a disease is to get to know the personal history of the patient through interrogation. By vinaathal, the physician should ask the patients about their native place, socio-economic status, food habits, personal habits, complaints and duration of illness etc. Poriyaal arithal, pulanaal arithal and vinaathal are applied through eight tools of investigation that are “Envagai Thervugal”.

Some of the vital aspects of vinaathal are,

1) Mukkutra Kaalam (Age distribution)

The period of a human life of 100 years is divided into three stages.

Stage	Year	Dominant Humor
First Stage	01 - 33 years	Vatha Period
Second Stage	34 - 66 years	Pitha Period
Third Stage	67 - 100 years	Kaba Period

Thinai (Land)

The study of dwelling places of patients is essential as the prevalence of endemic diseases is very common in certain areas.

Generally, the Nilam is classified into five. They are,

1. Kurinji Nilam Mountain and its surroundings
2. Mullai Nilam Forest and its surroundings
3. Marutha Nilam Fertile plains and their surroundings
4. Neithal Nilam Seashore and their surroundings
5. Palai Nilam Deserts and their suroundings

Marutha nilam people are more prone to diseases than other land people, as fertile lands of Maruthanilam is used for industrial purpose which pave way for urbanisation and settlement of huge population in smaller area.

Paruvakalam (Season)

In Siddha system of medicine, Siddhars classified a year into five seasons, each having two months.

S.No.	Kaalam	Kuttram	State of Kuttram
1.	Kar Kaalam (Avani & Purattasi) (Aug. 16 - Oct 15)	Vatham Pitham	Vettrunilai valarchi Thannilai valarchi
2.	Koothir Kaalam (Iypasi & Karthigai) (Oct. 16 - Dec. 15)	Vatham Pitham	Thannilai valarchi Vettrunilai valarchi
3.	Munpani Kaalam (Margazhi & Thai) (Dec. 16 - Feb. 15)	Pitham	Thannilai adaithal
4.	Pinpani Kaalam (Masi & Panguni) (Feb. 16 - April 15)	Kapam	Thannilai valarchi
5.	Elavenir Kaalam (Chithirai & Vaikasi) (Aprl. 16 - June 15)	Kapam	Vettrunilai valarchi
6.	Mudhu Venir Kaalam (Aani & Aadi) (June 16 - Aug. 15)	Vatham	Thannilai valarchi

Envagai Thervugal

"நாடிஸ்பரிசம் நாநிறம் மொழிவிழி
மலம் மூத்திரமிவை மருத்துவராயுதம்"

--அகத்தியர் நாடி

The above mentioned poem list out the Envagai Thervugal as below,

1. Naadi (Pulse)

2. Sparisam (Palpation)

3. Naa (Tongue examination)

4. Niram (Colour of the body)

5. Mozhi (Speech)

6. Vizhi (Eye examination)

7. Malam (Motion examination)

8. Moothiram (Urine examination)

Naadi nadai in Kalladaippu

விழுகும் சிலநேரம் விடுபட்டு நீரோடும்
ஒழுகிய வாயுவும் ஒதுங்கினால் நோகாது
வழுகிய மந்தத்தால் வாயுவந்தே புகில்
கழுமி முதிர்ந்திடும் கல்லொரிப்பு ஆகுமே

–திருமூலர் கருக்கிடை லைத்தியம் – 600

When vatham and mantham combine together, Kalladaippu noi occurs.

"அறைந்தோம்வாத ரோகியுடல்
அழற்கண்முகமும் பல்மலமும்
நிறைந்த விழியில் நீர் வடியும்
நீண்ட நாவு கறுத்திடவும்
திறைந்தமுள்ளாய் தானிருக்குஞ்
சிறு நீர் பொருமிக்கடுத்து வரும்
உறைந்த நீருங்கருகருத்து
முறையாய் ரோகமு முண்டாமே"

–அகத்தியர் நாடி,

–நோய் நாடல் நோய்முதல்நாடல் திரட்டு–முதல்பாகம்,பக்.165

“மேவியவாதஞ் செய்யும்

குணந்தனை விரும்பிக்கேளு

தாவிய வயிறு மந்தஞ்

சந்துகால் பொருத்து நோவாம்

சேவிய தாது நாசஞ்

சிறுத்துடன் சிறு நீர்வீழும்

காவியங் கண்ணினாளே

மலமது கருகிக் காணும்”

– இரத்தினசுருக்க நாடி

–நோய் நாடல் நோய்முதல்நாடல் திரட்டு–முதல்பாகம்,பக்.165

Agathiar naadi and Raththina churukka naadi describes that aggravation of vatham produces symptoms of Kalladaippu noi.

“பொருளான வாதத்தில் பித்தஞ் சேர்ந்து

பொருத்து குணங்களா முஷ்ண வாயுசத்தி

செரியாமை புளித்தேப்பம் பொருமல் நீரிற்

சிவப்பு மலம் பிடித்தலுருந்தாது நட்டம்

கருவான தேகமதிலுளைச்சல் சோம்பல்

கை கால் தறிப்பு நாக்கசக்கு மன்னம்

பரிவான வூண் குறைதல் ருசி கேடாதல்

பல நோயும் வருத்திவைக்கும் பாங்கு தானே”

– சதகநாடி

–நோய் நாடல் நோய்முதல்நாடல் திரட்டு–முதல்பாகம்,பக்.171

“ஏவலாய் குழலாய் பித்தஞ் செய்குணம் விளம்பக்கேளாய்

கோலவேல் விழி சிவந்து குளிர்ந்திடிரிருக்கு மல்லால்

சீலவே நீர்கடுத்து நொந்து சுறுக்கெனச்சி வந்து வீழும்

ஞாலமே கிறுகிறென்று நாவுலர்ந்திருக்குங்காணே".

– இரத்தின சுருக்க நாடி

–நோய் நாடல் நோய்முதல்நாடல் திரட்டு–முதல்பாகம்,பக்.168

The above poem reveals that aggravation of pitham produces the symptoms of Kalladaippu noi.

"எண்ணிய வாதமொன்றும் பித்தமிரண் டெழுந்துதாகில்

புண்ணென யுடம்புநோவாம் புகையெழ யெரியும் நெஞ்சு

திண்ணமாய் நாவரண்டு சிறுத்துநீர்க் கடுத்து விழும்

அண்ணவார் உரைந்தவுண்மை யாயுரு தேவந்தானே"

– தன்வந்திரி வைத்தியம் –முதல்பாகம் பக்.11

Sathaganaadi and Dhanvanthiri vaidhyam describes, when vatham and pitham combine together it results in the occurrence of Kalladaippu noi.

ஸ்பரிசம் (Touch)

By sparism, the temperature of skin (thatpam-cold or veppam-heat), smoothness, roughness, sweating, dryness, hard patches, swelling, abnormal growth of organs and tenderness can be felt.

On examination in Kalladaippu patients, tenderness over the lower abdomen, renal angle and lumbar region can be felt in Kalladaippu noi. In Valikalladaippu, swelling can be felt (may be due to hydronephrosis).

In pitha kalladaippu, body temperature increases in lower abdomen. In Iyyakalladaippu, sweating occurs all over the body at the time of colic.

நா (Tongue)

The physician is expected to observe the features of the tongue and its associated structures that include colour, size, shape, coating, moisture, movement, ulcer, fissures, crust and condition of teeth and gums. In Kalladaippu noi, if the patient suffers from constipation (valikalladaippu), the tongue would seem to be coated.

நிறம் (Colour)

The physician is required to observe the colour of the skin, conjunctiva, tongue, nail bed and hair etc and make a note of any abnormal colour changes. Normally,

Vali udal - Black colour

Azhal udal - Yellow or red colour

lyya udal - White or yellow colour

In Kalladaippu noi, body complexion depends upon the body constitution. Pallor of the body is observed in Sukkila ashmari.

"சிக்கிநீர் விழா மலங்கே மணல்விழும் வெளுக்குந்தேகம்
மிக்குணஞ் சுக்கிலாசு மரியசாத் தியமென்றோதோ"

-தன்வந்திரி வைத்தியம்,2ம் பாகம்-பக்.10

மொழி (Speech)

By examining mozhi (speech), characters, hoarseness, slurring speech, various disorders of speech such as dysarthria can be noted. In Kalladaippu

noi, there is low pitch voice due to agonizing pain in lower abdomen and burning micturation.

விழி (Eye)

The colour of conjunctiva is observed in Kalladaippu noi patients, the conjunctiva is pallor due to haematuria. In haematuria may cause secondary anaemia.

மலம் (Stools)

It is necessary to examine the nature, colour and quantity of stool and presence of blood or pus. In Valikalladaippu, proctalgia and oliguria occur due to renal colic.

"தரித்து நாபிக்குங்கீழ் சுருக்காய் குற்றிச்
சலமலந்தான் வீழாமற் றம்பமாகி"

-யூகி லைத்திய சிந்தாமணி-800-பக்.284

நீர்க்குறி (Urine examination)

Urinary examination is a good diagnostic method compared to Naadi and other Envagai Thervugal. Theraiyar mentioned about urine examination as below.

நீர்க்குறிச்சிறப்பு

“தர்க்கசாத் திரிக ளானோர்
தங்களிற் றேர்ந்து நாடி
வர்க்கமாம் நாடி தன்னில்
வருவது மயக்க மென்றே
உற்றநீர்ப் பரீஷை யாய்ந்தே
யுரைத்தன ரிதற்கு நேராய்
மற்றொரு விதிநூ லில்லை
மருத்துவக் கலைவல்லோர்க்கே”

– சித்த மருத்துவாஞ்சச் சுருக்கம், பக்.568

Siruneerin pothugunam

“வந்தநீர்க் கரியெடை மணம் நுரை எஞ்சலென்
றைந்திய லுளவை யறைகுது முறையே”

– சித்த மருத்துவாஞ்சச் சுருக்கம், பக்.510

The above poems states that the five parameters should be examined in each urine sample.

1. Niram (Colour) 2. Eadai (Specific gravity) 3. Nurai (Froth) 4. Natram (Smell) 5. Enjal (Deposits)

Niram (Colour)

Nira Thogai

"பீதம் செம்மைபைங் கருமை வெண்மையென்
றோதைங் கொழுமையை யொத்துகு நீரே"

-- சித்த மருத்துவாஙகச் சுருக்கம், பக்.510

They above poem reveals that urine colour may be any one of the followings,

1. Yellow
2. Red
3. Green
4. Black
5. White

கல்லடைப்பு நீரின் குணம் (Colour indicating urinary stones)

"தீப்புலால் கழுநீர்ச் செயலெனிற் குண்டிக்
காய்த்துர்ப் பலத்தால் கதித்த நீராமத்
துர்ப்பலக் கபமும் சோரியும் கொதிப்புறப்
பற்பக லாகப் பையப் பதிந்ததே"

-- சித்த மருத்துவாஙகச் சுருக்கம், பக்.520

The urine colour resembling the colour of the flesh washed water, indicate the occurrence of kidney diseases. (crystaluria)

Edai (Specific Gravity)

"மிகத்தடிப் பும்மிகத் தேறலும் இன்றெனில்
சுகத்தைத் தரும்மெய்ச் சுபாவநீர் நன்றே"

– சித்த மருத்துவாஙகச் சுருக்கம், பக்.528

Urine which is not thick, is considered healthy.

Nurai (Froth)

"பந்தமெய்ப் பசையிள கப்படும் பருவத்
தந்தர்ப் பூதமாய் அநிலமூத் திரத்தில்
சம்பந்தப் படும் ததிநுரைப் புனலே"

– சித்த மருத்துவாஙகச் சுருக்கம், பக்.528

Urine is frothy in nature under normal condition. When there is a change in vali, azhal, iyyam there will be a change in the frothiness of urine too.

Naatram (Smell)

மணவிலக்கணம்

"காணிதில் சீழுங் கலந்திழி மணமுறின்
கருப்பநா பிகளுளுங் காமநா ளத்துளும்
விரணமுன் டின்றேல் எய்துமஸ் மரியல
திருத்தலே திண்ண மெனமனத் துன்னே"

– சித்த மருத்துவாஙகச் சுருக்கம், பக்.519

The above states that foul odour with pyuria is observed in patients with urolithiasis assoicted with secondary urinary tract infection and urethral ulcer.

Enjal (Deposits)

"நார்த்தி நீர்பால் போல
நவையுற்றங் கிழியு மானால்
மாரற்ப முற்ற நீரி
லடிமண்டிக் கிடந்த தானால்
பாரிந்த மெழுகு மாங்காய்
பற்றிய கல்லி னாலே
சீருற்ற செய்கை யென்று
தெரிவுறச் செப்ப லாமே"

– சித்த மருத்துவாங்கச் சுருக்கம், பக்.575

In Siddha Maruthuvanga Surukkam the following clinical features have been mentioned with regard to Kalladaippu noi. They are,

i. Pyuria - curd like micturaiton (cloudy urination)

ii Crystaluria - sand like deposits

Neikuri

"அருந்துமா றிரதமும் அவிரோ தமதாய்
அஃகல் அலர்தல் அகாலவுண் தவிர்ந்தழற்
குற்றள வருந்தி உறாங்கி வைகறை
ஆடிக் கலசத் தாவியே காதுபெய்
தொருமுகூர்த் தக்கலைக் குட்படு நீரின்
நிறக்குறி நெய்க்குறி நிருமித்தல் கடனே"

– சித்த மருத்துவாங்கச் சுருக்கம், பக்.509

Preparation of Patient

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

Method

After waking up in the early morning, urine should be collected in a glass container and must be examined within 1½ hours. Then a drop of gingelly oil should be added through the side of the container without any disturbance . The nature of neikuri should be noted under direct sunlight.

Obeservation

Vatha neer

"அரவென நீண்டிடின் அஃதே வாதம்"

– சித்தமருத்துவாங்கச் சுருக்கம், பக்.532

The drop of oil lengthening like a snake, it indicates vatha neer.

Pitha neer

"ஆழிபோற் பரவின் அஃதே பித்தம்"

– சித்தமருத்துவாங்கச் சுருக்கம், பக்.533

The drop of oil spreading like a ring, indicates pitha neer.

Kapa neer

"முத்தொத்து நிற்கின் மொழிவதென் கபமே"

– சித்தமருத்துவாங்கச் சுருக்கம், பக்.534

The drop of oil remaining like a pearl, indicates kaba neer.

Thontha neer

"அரவிலாழியும் ஆழியில் அரவும்
அரவின்முத்தும் ஆழியில் முத்தும்
தோற்றில் தொந்த தோடங்களாமே"

The thonthaneer appears as a combination of the above patterns.

Mukkutra neer

The drop of oil immersing in to the urine, indicates mukkutra neer.

NOI KANIPPU VIVAADHAM

(Differential diagnosis of Kalladaippu)

நீரடைப்பு

சிறுநீர் சுருங்கி அளவில் குறைந்திழிதலும் நீர்ப்பையும் நீர்ப்புழையும், எரிதலும் வயிறு விம்மி நோகுதலுமான இயல்புடையது. நீர்ப்புழையில், எரிச்சல், நமை, நோதல் என்னுங் குறிகளைக்காட்டி, சிறுநீர் கழியும் போது தாங்க முடியாத எரிச்சலையும் நோயையுந் தந்து சூட்டுடன் நீர் இறங்கும். அப்போது நீரிறங்குதற்கு முன்பேனும், பின்பேனும் பச்சைக் குருதி வெளியாகும். சிலவேளை நீருடன் குருதி கலந்து கருத்து வெளியாவதும் உண்டு. இத்துடன் இளைப்பு, பெருமூச்சு, ஆயாசம், மார்புநோய், முக வீக்கம், சிறுசுரம், இடுப்பு நோய், ஆண்குறி வீக்கம், அடி வயிறு நோதல், குத்தல் என்னுங் குறி குணங்கள் இன்மையாலும்.

நீர்க்கட்டு

நாழி கணக்காய்ச் சிறுநீர் பெய்யாமலே இருப்பினும், நீர்ப்பை நிறையாது இருத்தல், நீர்ப்புழை வழியே சலாகையிடினும் சிறு சொட்டு நீரும் வெளியாகாதிருத்தல் என்னும் இயல்புடையதாம். நீர்க்கட்டு நோய்களில், நீர்க் குண்டிக்காயுடன் தொடரும். நீர்ப்புழைகளில் ஒன்று தடைப்பட்டு மற்றொன்றின் தொழில் கெடாதிருப்பின் மிகுதியும் கேடு உண்டாவதில்லை. இரண்டு புழைகளும் ஒரே காலத்தில் அடைபடுமாயின், தீமைகள் பல செய்யும். சிறுநீர் முற்றிலும் கட்டுப்பட்டு, சிறிதும் இறங்காமை, மயக்கம், தலை சுற்றல் என்னும் குறிகுணங்களை காட்டி, வெகு சீக்கிரத்தில் படுக்கையில் கிடக்கச் செய்து, அரட்டல், புரட்டல், கைகால்கள சில்லிடல், நாவறட்சி, கொறுக்குவலி, கண்மணி சுருங்கல் என்னும் குறிகுணங்கள் இன்மையாலும்

நீர்ச்சுருக்கு

நீரினையருக்க லென்னும் நீர்க்கட்டின் குணத்தைக் கேட்டி
நீதமில் லாமற்கோச நீர்ப்புழை நெருப்பு போலாம்
நீபனா யுதத்தாற் பட்ட நீலவம் பராமாங் குக்கி

எனத்தேரன் கரிசலில் கூறியதுபோல், இந்நோயில் சிறுநீர் சுருங்கி வெளியாகாமலும், நீர்ப்புழையில் குத்தல், எரிச்சல் வலி ஆகியவற்றை உண்டாக்கியும், முகத்தை வீங்கச் செய்தும், சொட்டு சொட்டாய் நீரிறங்கியும் துன்புறுத்தும் இயல்புடையதாம். வழக்கம் போல் நீர் சரியாக இறங்காமல், மிக்க நேரங் கழித்து நீர்க்கழிகையில் அந்நீர் அளவில் குறைந்தும் எடையில் சுருங்கியும் நிறத்தில் சிவந்தும் சிலவேளை புலால் மணத்துடன் வெளிப்படும். நீர்ப்புழையில் தாங்கமுடியாத வலி, எரிச்சல் என்னுங் குறிகளை உண்டாக்கி, நீர் சொட்டு சொட்டாய் இறங்கும். இந்நோயில் ஐயங் கூடில் முகத்தில் வீக்கமும், இடுப்பில் வலியும் ஏற்படும்.

மேற்கண்ட குறிகுணங்கள் இன்மையாலும், சிறுநீர்க் கழிக்குங்கால் அஃது இறங்கிக் கொண்டிருக்கும் போதே, திடீரென நீரடைத்தல், குறிமுனை நோதல், நீர்ப்புழை எரிதல், இடுப்பின் பின்புறத்தும், முதுகுத் தண்டின் பக்கத்தும் நோதல், சிறுநீரில் மணலையொத்த சிறுகற்கள் கலந்திருத்தல், முன்பு கூறிய முற்குறிகளைக் காட்டி அடிக்கடி வெளியாகும். நீர் முற்றும் வெளியாகாமல் திடீரென அடைத்துக் கொள்வதும் உண்டு. அப்போது தாங்கமுடியாத வலி ஆண்குறியிலும் எருவாய்க்கு மேற்பகுதியிலும் உண்டாகும். சில வேளைகளில் கல் புரண்டு கொண்டே வந்து, வெளியாவதற்கு முயன்று ஆண்குறி நடுவில் அல்லது முனையில் வந்து தடைப்பட்டு ஆங்கு மிகுந்த வலியையும் வீக்கத்தையும் உண்டாக்கும். கற்கள் கரடுமுரடாயேனும், கூர்மையாயேனுமிருப்பின் கீழ் வயிற்றிலும், நீர்ப்புழையிலும் தாங்கமுடியாத எரிச்சலையும் வலிமையும் தந்து குருதியை மிகவும் வெளிப்படுத்தும்.

சாத்தியம், அசாத்தியம் (Prognosis)

“சூட்டிட்ட சாத்தியத்தைச் சொல்லக் கேளாய்
சுளுக்காகும் வாதத்தின் கல்ல டைப்பு
பூட்டிட்ட பித்தத்தின் கல்ல டைப்புப்
புகழான சேட்டுமத்தின் கல்ல டைப்பு
மூட்டிட்ட இதுமூன்று மசாத்ய மாகி
முனையான மருந்துகளிற் செம்மை யாகும்
தோட்டிட்ட தொந்தமாங் கல்ல டைப்புத்
தொடுசுறவே கொல்லுமிது சூட்சந் தானே”

– யூகி வைத்திய சிந்தாமணி–800

According to Yugi Vaidhya Chinthaamani and Siktcharathna Deepam, Vatha, Pitha and Kapa Kalladaippu noi are curable and preventable. Mukkutra Kalladaippu is not curable.

According to Roga Nirnaya Saaram under Roga Nithanam, symptoms of Kalladaippu noi like scrotal swelling and anuria are not curable.

மருத்துவம் (Line of Treatment)

The main objective of treatment is to bring down the deranged mukkutrams to natural equilibrium by giving purgatives, which cure derangement of vatham, which is one of the causes for Kalladaippu noi.

"பேதியால் வாதம் தாழும்"

"வாந்தியால் பித்தம் தாழும்"

"நசிய அஞ்சனத்தால் கபம் தாழும்"

As per the above mentioned poem purgation should be given to all patients as per their body condition.

In this present study,

Aruvaghai Chooranam - 2 gm (BD Morning & Evening with hot water after food)

is given to the selected patients which showed good response and in all my Kalladaippu noi patients.

In Siddha system, treatment is not only for curing the disease but also for prevention and improving the body condition after curing the disease. This is said as kappu, neekkam and thiraippu.

The mode of preparation and properties and constituents of ingredient of the drug are given in **Annexure-I**.

Fermentation

An attack of renal colic may be aborted by the application of heat fermentation (hot water bottle) to the lumbar region. Immediate treatment of loin pain or renal colic is bed rest.

Diet

Diet for Kalladaippu Patient

குருவை அல்லது மணக்கத்தை அரிசியாலாக்கிய சோறும் முள்ளங்கி *(Raphanus sativus)* கீரைத்தண்டு, சிறுகீரை *(Amaranthus gangeticus)* வாழைத்தண்டு *(Plantain stem)*, அவரை *(Dolichos lablab)*, வெண்டை *(Hibiscus esculentas)*, வசலை *(Portulacca oleracea)* பசலைக்கீரை *(Portulacea Pudrifida)*, காசினிக்கீரை *(Hibiscus kannabinus)* பார்லி அரிசிக்கஞ்சி *(Parley water)* கொடுக்கவும்.

Diet restriction for Kalladaippu

தக்காளி (Tomato), முட்டைகோஸ் (Cabbage), காலிஃப்ளவர் (Cauliflower) நீக்கவும். உப்பு நிறைந்த நீர் குடிக்கக்கூடாது.

Advice

1. Patients should drink large quantity of water (4 lit/ day)

2. Patient should not suppress the excretion of urine and seminal fluid.

3. Regarding prevention **Anubhava vaidhya deva ragasiyam** states that one should not suppress the excretion of Moothiram (Urine) and Sukkilam (Seminal fluid) is most predisposing cause for Kalladaippu noi.

REVIEW OF LITERATURES

B. MODERN ASPECTS

MODERN ASPECTS

Anatomy and Physiology of Urinary System

kidney

The **kidneys** are organs that serve several essential regulatory roles in most animals, including vertebrates and some invertebrates

Measurement

The kidney is approximately

Length 11–14 cm

Width 6 cm and

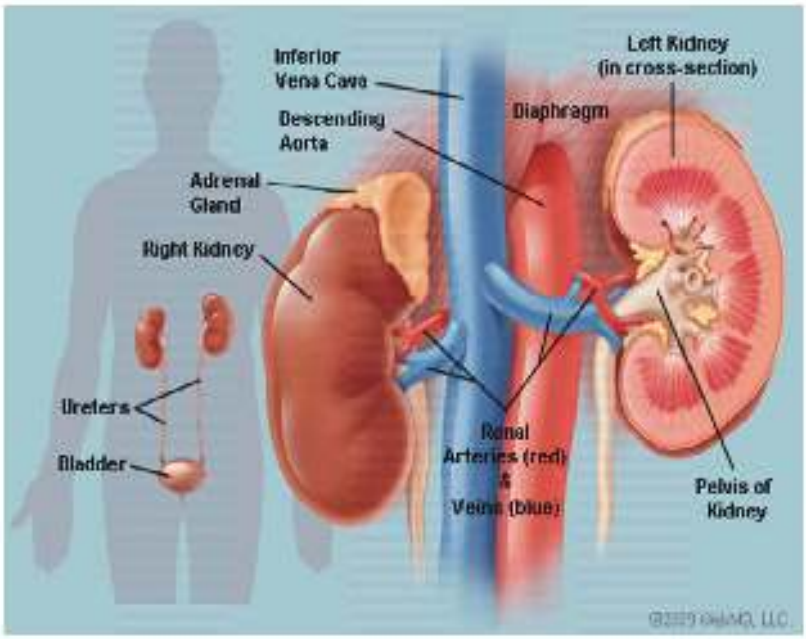
Thickness 4 cm .

Location

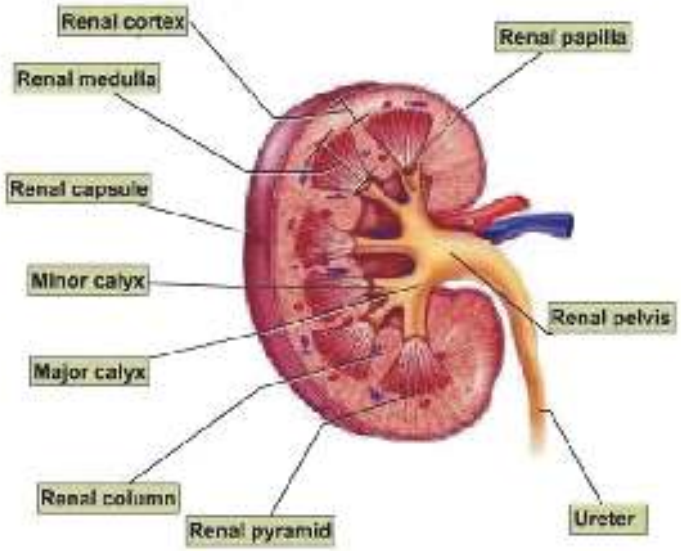
Located at the rear of the abdominal cavity in the retroperitoneum, located between the transverse processes of T12-L3 vertebrae, left kidney typically somewhat more superior in position than the right. The upper poles are normally oriented more medially and posteriorly than the lower poles.

The kidney has a bean-shaped structure; each kidney haa convex and concavesurface. The concave surface, the renal hilum, is the point at which the renal artery enters the organ, and the renal vein and ureter leave.

Anatomy of Kidney



Cross section of Kidney



The kidney is surrounded by tough fibrous tissue, the renal capsule, which is itself surrounded by perinephric fat, renal fascia and paranephric fat.

The anterior (front) border of these tissues is the peritoneum, while the posterior (rear) border is the transversalis fascia.

The superior border of the right kidney is adjacent to the liver; and the spleen, for the left kidney. Therefore, both move down on inhalation.

The substance, or parenchyma, of the kidney is divided into two major structures: superficial is the renal cortex and deep is the renal medulla.

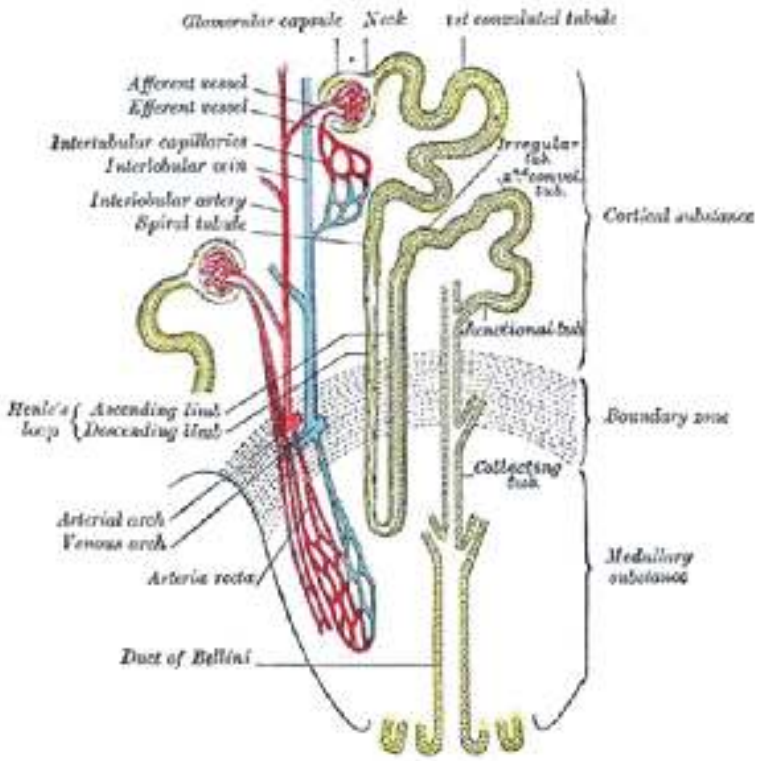
Grossly, these structures take the shape of 8 to 18 cone-shaped renal lobes, each containing renal cortex surrounding a portion of medulla called a renal pyramid . Between the renal pyramids are projections of cortex called renal columns.

NEPHRON

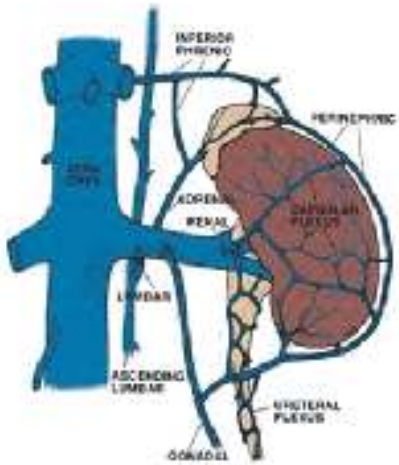
Nephron is the basic structural and functional unit of the kidney. Its chief function is to regulate the concentration of water and soluble substances like sodium salts by filtering the blood, reabsorbing what is needed and excreting the rest as urine.

A nephron eliminates wastes from the body, regulates blood volume and blood pressure, controls levels of electrolytes andmetabolites, and

Nephron



Blood supply



regulates blood pH. Its functions are vital to life and are regulated by hormones such as antidiuretic hormone, aldosterone, and parathyroid hormone.

In humans, a normal kidney contains 800,000 to 1.5 million nephrons.

The initial filtering portion of a nephron is the renal corpuscle, located in the cortex, which is followed by a renal tubule that passes from the cortex deep into the medullary pyramids. Part of the renal cortex, a medullary ray is a collection of renal tubules that drain into a single collecting duct.

The tip, or papilla, of each pyramid empties urine into a minor calyx; minor calyces empty into major calyces, and major calyces empty into the renal pelvis, which becomes the ureter.

Types of nephrons

Two general classes of nephrons are cortical nephrons and juxtamedullary nephrons, both of which are classified according to the length of their associated Loop of Henle and location of their renal corpuscle. All nephrons have their renal corpuscles in the cortex. *Cortical* nephrons have their Loop of Henle in the renal medulla near its junction with the renal cortex, while the Loop of Henle of juxtamedullary nephrons is located deep in the renal medulla; they are called *juxtamedullary* because their renal corpuscle is located near the medulla The majority of nephrons are cortical. Cortical nephrons have

a shorter loop of Henle compared to juxtamedullary nephrons. The longer loop of Henle in juxtamedullary nephrons create a hyperosmolar gradient that allows for the creation of concentrated urine.

Each nephron is composed of an initial filtering component the “renal corpuscle” and a tubule specialized for reabsorption and secretion (the “renal tubule”). The renal corpuscle filters out large solutes from the blood, delivering water and small solutes to the renal tubule for modification

Renal Corpuscle

Composed of a glomerulus and the Bowman’s capsule, the renal corpuscle (or Malphigian corpuscle) is the beginning of the nephron. It is the nephron’s initial filtering component.

The glomerulus is a capillary tuft that receives its blood supply from an afferent arteriole of the renal circulation. The glomerular blood pressure provides the driving force for water and solutes to be filtered out of the blood and into the space made by Bowman’s capsule. The remainder of the blood (only approximately 1/5 of all plasma passing through the kidney is filtered through the glomerular wall into the Bowman’s capsule) passes into the efferent arteriole.The diameter of efferent arteriole is comparatively less than that of afferent arteriole, increasing the hydrostatic pressure in the glomerulus. It then moves into the vasa recta, which are only found in juxtamedullary

nephrons and not cortical nephrons. The vasa recta are collecting capillaries intertwined with the convoluted tubules through the interstitial space, in which the reabsorbed substances will also enter. This then combines with efferent venules from other nephrons into the renal vein, and rejoins the main bloodstream.

The Bowman's capsule, also called the glomerular capsule, surrounds the glomerulus. It is composed of a visceral inner layer formed by specialized cells called podocytes, and a parietal outer layer composed of a single layer of flat cells called simple squamous epithelium.

Fluids from blood in the glomerulus are filtered through the visceral layer of podocytes, and the resulting glomerular filtrate is further processed along the nephron to form urine

The renal tubule is the portion of the nephron containing the tubular fluid filtered through the glomerulus.[5] After passing through the renal tubule, the filtrate continues to the collecting duct system, which is not part of the nephron

The components of the renal tubule are:

· Proximal convoluted tubule (lies in cortex and lined by simple cuboidal epithelium with brushed borders which help to increase the area of absorption greatly.)

· Loop of Henle (hair-pin like i.e. U-shaped and lies in medulla)

· Descending limb of loop of Henle

· Ascending limb of loop of Henle

· The ascending limb of loop of Henle is divided into 2 segments: Lower end of ascending limb is very thin and is lined by simple squamous epithelium. The distal portion of ascending limb is thick and is lined by simple cuboidal epithelium.

· Thin ascending limb of loop of Henle

· Thick ascending limb of loop of Henle

· Distal convoluted tubule

Blood supply

The kidneys receive blood from the renal arteries, left and right, which branch directly from the abdominal aorta. Despite their relatively small size, the kidneys receive approximately 20% of the cardiac output.

Each renal artery branches into segmental arteries, dividing further into interlobar arteries which penetrate the renal capsule and extend through the renal columns between the renal pyramids. The interlobar arteries then supply blood to the arcuate arteries that run through the boundary of the

cortex and the medulla. Each arcuate artery supplies several interlobular arteries that feed into the afferent arterioles that supply the glomeruli.

The **interstitum** (or **interstitium**) is the functional space in the kidney beneath the individual filters (glomeruli) which are rich in blood vessels. The interstitum absorbs fluid recovered from urine. Various conditions can lead to scarring and congestion of this area, which can cause kidney dysfunction and failure.

After filtration occurs the blood moves through a small network of venules that converge into interlobular veins. As with the arteriole distribution the veins follow the same pattern, the interlobular provide blood to the arcuate veins then back to the interlobar veins which come to form the renal vein exiting the kidney for transfusion for blood.

NERVE SUPPLY

The kidney and nervous system communicate via the renal plexus, whose fibers course along the renal arteries to reach each kidney.

Input from the sympathetic nervous system triggers vasoconstriction in the kidney, thereby reducing renal blood flow. The kidney also receives input from the parasympathetic nervous system, by way of the renal branches of Vagus nerve (Cranial nerve X).

Sensory input from the kidney travels to the T10-11 levels of the spinal cord and is sensed in the corresponding dermatome. Thus, pain in the flank region may actually be referred pain from the corresponding kidney.

Function of Kidniys

Kidneys perform vital functions. By excreting urine, kidneys play principal role in the maintenance of internal environment. In addition, kidneys perform many other functions as described below.

Role in homeostasis

The primary function of kidneys is homeostasis. It is accomplished by the formation of urine. Kidneys are not only the excretory organs, but are also the regulatory organs. Their major role is in homeostasis. During the formation of urine, kidneys regulate various activities in the body, which are concerned with homeostasis.

i. Excretion of waste products

Kidneys excrete the unwanted waste products which are formed during metabolic activities.

a. Urea - End product of amino acid metabolism

b. Uric Acid - End product of nucleic acid metabolism.

c. Creatinine - End product of metabolism in muscles.

d. Bilirubin - End product of haemoglobin degradation.

Kidneys also excrete harmful foreign chemical substances like, toxins, drugs, heavy metals, pesticides etc.

ii. Maintenance of water balance

Kidneys maintain the water balance in the body by conserving water when it is decreased and excreting water when it is excess in the body.

iii. Maintenance of electrolyte balance

Maintenance of electrolyte balance, especially sodium is in relation to water balance. Kidneys retain sodium if the osmolarity of body water decreases and eliminate sodium when osmolarity increases.

iv. Maintenance of acid base balance

The pH of the blood and body fluids should be maintained within normal range for healthy living. Body is under constant threat to develop acidosis, because of production of lot of acids during metobolic activities. However, it is prevented by kidneys, lungs and blood buffers which eliminate these acids. Among these organs, kidneys play major role in preventing acidosis. Infact, kidneys are the only organs, which are capable of eliminating certain metabolic acids like sulphuric and phosphoric acids.

2. Haemopoietic function

Kidneys stimulate the productions of erythrocytes by secreting erythropoietin. Erythropoietin is the important stimulating factor for erythropoiesis. Kidneys also secrete another factor called thrombopoietin, which stimulates the production of the thrombocytes.

3. Endocrine function

Kidneys secrete many hormonal substance in addition to erythropoietin and thrombopoietin. The hormones secreted by kidneys includes erythropoietin, thrombopoietin, renin, 1,25 dihydroxy cholecalciferol, prostaglandins and kinins

4. Regulation of blood pressure.

Kidneys play an important role in the regulation of arterial blood pressure. Kidneys regulate arterial blood pressure by two ways.

i. By regulating the volume of extracellular fluid

ii. Through renin - angiotensin mechanism

Regulation of blood calcium level

Kidneys play a key role in the regulation of blood calcium level by activating 1, 25-dihydroxy cholecalciferol into vitamin D. Vitamin D is necessary for the absorption of cacium from intestine.

Ureters

The **ureters** are the two tubes which convey the urine from the kidneys to the urinary bladder. Each commences within the sinus of the corresponding kidney as a number of short cup-shaped tubes, termed **calyces,** which encircle the renal papillæ. Since a single calyx may enclose more than one papilla the calyces are generally fewer in number than the pyramids—the former varying from seven to thirteen, the latter from eight to eighteen. The calyces join to form two or three short tubes, and these unite to form a funnel-shaped dilatation, wide above and narrow below, named the **renal pelvis,** which is situated partly inside and partly outside the renal sinus. It is usually placed on a level with the spinous process of the first lumbar vertebrae.

The ureter descends retroperitoneally on the lateral pelvic wall. At the level of the ischial spine, it turns forward and medially. In the male, the ureter lies in the sacrogenital fold and is crossed medially by the ductus deferens. In the female, the ureter is at first related to the posterior border of the ovary; it then lies in the uterosacral ligament and is crossed anteriorly by the uterine

artery. It passes about 2 cm lateral to the cervix uteri (and hence may be endangered in hysterectomy) and courses in front of the lateral border of the vagina. A ureteric stone at this level may even be palpable per vaginam. On entering the back of the bladder, the ureter is embedded for about 2 cm in the wall of that organ. There the ureteric lumen is narrowest, and the muscular coats of the ureter and bladder are continuousThe **Ureter Proper** measures from 25 to 30 cm. in length, and is a thick-walled narrow cylindrical tube which is directly continuous near the lower end of the kidney with the tapering extremity of the renal pelvis. It runs downward and medialward in front of the Psoas major and, entering the pelvic cavity, finally opens into the fundus of the bladder.

The ureter is composed of three coats: fibrous, muscular, and mucous coats.

The fibrous coat (tunica adventitia) is continuous at one end with the fibrous tunic of the kidney on the floor of the sinus; while at the other it is lost in the fibrous structure of the bladder.

The muscular coat (tunica muscularis) consists of two layers, longitudinal and circular: the longitudinal fibers become lost upon the sides of the papillæ at the extremities of the calyces; the circular fibers may be traced surrounding the medullary substance in the same situation. In the ureter

proper the muscular fibers are very distinct, and are arranged in three layers: an external longitudinal, a middle circular, and an internal.

The mucous coat (tunica mucosa) is smooth, and presents a few longitudinal folds which become effaced by distension. It is continuous with the mucous membrane of the bladder below, while it is prolonged over the papillæ of the kidney above. Its epithelium is of a transitional character, and resembles that found in the bladder

The upper half of the ureter is in the abdomen proper; the lower half is in the pelvis.

The **abdominal part** (*pars abdominalis*) lies behind the peritoneum on the medial part of the Psoas major, and is crossed obliquely by the internal spermatic vessels. It enters the pelvic cavity by crossing either the termination of the common, or the commencement of the external, iliac vessels.

At its origin the *right* ureter is usually covered by the descending part of the duodenum, and in its course downward lies to the right of the inferior vena cava, and is crossed by the right colic and ileocolic vessels, while near the superior aperture of the pelvis it passes behind the lower part of the mesentery and the terminal part of the ileum. The *left* ureter is crossed by the left colic vessels, and near the superior aperture of the pelvis passes behind the sigmoid colon and its mesentery.

The **pelvic part** (*pars pelvina*) runs at first downward on the lateral wall of the pelvic cavity, along the anterior border of the greater sciatic notch and under cover of the peritoneum. It lies in front of the hypogastric artery medial to the obturator nerve and the umbilical, obturator, inferior vesical, and middle hemorrhoidal arteries. Opposite the lower part of the greater sciatic foramen it inclines medialward, and reaches the lateral angle of the bladder, where it is situated in front of the upper end of the seminal vesicle and at a distance of about 5 cm. from the opposite ureter; here the ductus deferens crosses to its medial side, and the vesical veins surround it. Finally, the ureters run obliquely for about 2 cm. through the wall of the bladder and open by slit-like apertures into the cavity of the viscus at the lateral angles of the trigone. When the bladder is distended the openings of the ureters are about 5 cm. apart, but when it is empty and contracted the distance between them is diminished by one-half. Owing to their oblique course through the coats of the bladder, the upper and lower walls of the terminal portions of the ureters become closely applied to each other when the viscus is distended, and, acting as valves, prevent regurgitation of urine from the bladder.

Vessels and Nerves

The **arteries** supplying the ureter are branches from the renal, internal spermatic, hypogastric, and inferior vesical.

The **nerves** are derived from the inferior mesenteric, spermatic, and pelvic plexuses.

Constrictions of the ureter

There are 3 main constrictions in the ureter

1. At pelvic ureteric junction

2. At pelvic brim

3. Where ureter pierces the bladder wall.

Constriction of ureter is important because, some times ureteric calculi may cause obstruction at the sites of constrictions of the ureter.

Urinary bladder

The urinary bladder is a musculomembranous sac which acts as a reservoir for the urine; and as its size, position, and relations vary according to the amount of fluid it contains.

The empty bladder in vivo lies almost entirely within the pelvis and rests on the pubis and pelvic floor. As the organ fills, it ascends into the abdomen proper and may reach the level of the umbilicus. In infancy, however, even the empty bladder lies mostly within the abdomen proper.

Ligaments

The bladder is connected to the pelvic wall by the fascia endopelvina. In front this fascial attachment is strengthened by a few muscular fibers, the **Pubovesicales,** which extend from the back of the pubic bones to the front of the bladder; behind, other muscular fibers run from the fundus of the bladder to the sides of the rectum, in the sacrogenital folds, and constitute the **Rectovesicales.**

The vertex of the bladder is joined to the umbilicus by the remains of the urachus which forms the **middle umbilical ligament,** a fibromuscular cord, broad at its attachment to the bladder but narrowing as it ascends.

From the superior surface of the bladder the peritoneum is carried off in a series of folds which are sometimes termed the **false ligaments of the bladder.** Anteriorly there are three folds: the **middle umbilical fold** on the middle umbilical ligament, and two **lateral umbilical folds** on the obliterated hypogastric arteries. The reflections of the peritoneum on to the side walls of the pelvis form the lateral false ligaments, while the sacrogenital folds constitute posterior false ligaments.

Relations.

The empty bladder is less rounded and is commonly said to have four surfaces: superior, right and left inferolateral, and posterior (or base).

The superior surface and the upper part of the base are covered by peritoneum. As the bladder fills and ascends, the peritoneum is lifted off the abdominal wall; hence the reflection becomes higher. The peritoneal relations are important in rupture of the bladder, which may result in either intraperitoneal or extraperitoneal extravasation of urine Behind, the peritoneum forms the rectovesical (or uterovesical) pouch. The superior surface is related to the intestine and the body of the uterus.

The inferolateral surfaces are related to the retropubic space, which contains veins and a pad of fat. The base faces backward and downward and is related to the seminal vesicles, ductus deferentes, and rectum or to the vagina and supravaginal cervix.

The apex of the bladder is connected to the umbilicus by the median umbilical ligament, which is a remnant of the urachus. The bladder is connected to the umbilicus also by the right and left medial umbilical ligaments, which are the obliterated umbilical arteries. The main part of the bladder is termed its body. The lowest part, or neck, of the bladder is attached to the pelvic diaphragm and is continuous in the male with the prostate. Another fascial support, the lateral ligament, extends backward on each side from the base of the bladder to the sacrogenital fold.

The triangular area formed between the orifices of the right and left ureters and the internal urethral orifice is termed the trigone. Its mucosa is

smooth, flat, red to pink, and firmly attached. Muscle fibers between the two ureteric orifices raise a fold known as the interureteric ridge. Behind the internal urethral orifice, a median fold (the uvula) formed by muscle fibers, the middle lobe of the prostate, or by both may develop with increasing age.

Structure

The bladder is composed of the four coats:

i. serous

ii. muscular

iii. submucous

iv. mucous coats.

The **serous coat** (*tunica serosa*) is a partial one, and is derived from the peritoneum. It invests the superior surface and the upper parts of the lateral surfaces, and is reflected from these on to the abdominal and pelvic walls.

The **muscular coat** (*tunica muscularis*) consists of three layers of unstriped muscular fibers: an external layer, composed of fibers having for the most part a longitudinal arrangement; a middle layer, the fibers are arranged, more or less, in a circular manner; and an internal layer, in which the fibers have a general longitudinal arrangement.

The fibers of the external layer arise from the posterior surface of the body of the pubis in both sexes (*musculi pubovesicales*), and in the male from the adjacent part of the prostate and its capsule. At the sides of the bladder the fibers are arranged obliquely and intersect one another. This layer has been named the Detrusor urinæ muscle.

The fibers of the middle circular layer are very thinly and irregularly scattered on the body of the organ, and, although to some extent placed transversely to the long axis of the bladder, are for the most part arranged obliquely. Toward the lower part of the bladder, around the internal urethral orifice, they are disposed in a thick circular layer, forming the Sphincter vesicæ, which is continuous with the muscular fibers of the prostate.

The internal longitudinal layer is thin, and its fasciculi have a reticular arrangement, but with a tendency to assume for the most part a longitudinal direction. Two bands of oblique fibers, originating behind the orifices of the ureters, converge to the back part of the prostate, and are inserted by means of a fibrous process, into the middle lobe of that organ. They are the muscles of the ureters, described by Sir C. Bell, who supposed that during the contraction of the bladder they serve to retain the oblique direction of the ureters, and so prevent the reflux of the urine into them.

The **submucous coat** (*tela submucosa*) consists of a layer of areolar tissue, connecting together the muscular and mucous coats.

The **mucous coat** (*tunica mucosa*) is thin, smooth, and of a pale rose color. It is continuous above through the ureters with the lining membrane of the renal tubules, and below with that of the urethra. The loose texture of the submucous layer allows the mucous coat to be thrown into folds or *rugæ* when the bladder is empty. Over the trigonum vesicæ the mucous membrane is closely attached to the muscular coat, and is not thrown into folds, but is smooth and flat.

Blood Supply and Lymphatic Drainage.

The bladder is supplied mainly by the superior and inferior vesical arteries, which arise directly or indirectly from the **internal iliac artery**. The veins drain into **the internal iliac vein**. The lymphatic vessels go to the various iliac nodes.

Innervation

The bladder is supplied by branches of the vesical and prostatic plexuses, which are extensions of the inferior hypogastric plexuses.

The branches include:

(1) parasympathetic motor fibers to the detrusor (i.e., the muscular coat); (2) sensory fibers that are stimulated by stretching, causing a sensation of fullness and activating reflexes;

(3) sympathetic fibers to blood vessels.

Micturition (or urination) is preceded by contraction of the diaphragm and abdominal wall. The neck of the bladder descends, the detrusor contracts reflexly, and urine is expelled from the bladder.

Urethra

The urethra is a fibromuscular tube that conducts urine from the bladder (and semen from the ductus deferens) to the exterior. It begins at the neck of the bladder, traverses the pelvic and urogenital diaphragms, and ends at the external urethral orifice.

The female urethra, about 4 cm in length, is fused with the anterior wall of the vagina. It ends between the clitoris and the vagina.

The male urethra, about 20 cm in length, comprises three parts: prostatic, membranous, and spongy The prostatic part, which is the most dilatable, descends through the prostate. Its posterior wall presents a median ridge, the urethral crest, the summit of which is termed the colliculus seminalis (or the verumontanum). A diverticulum, the prostatic utricle (probably corresponding to portions of the uterus and vagina) opens on the colliculus, as do the ejaculatory ducts. The prostatic ducts open into a groove, the prostatic sinus, on each side of the urethral crest. The membranous part descends from the apex of the prostate to the bulb of the penis and is

surrounded by the sphincter urethrae. The lowermost part of the membranous urethra is liable to rupture or to penetration by a catheter. The spongy part lies in the corpus spongiosum and traverses the bulb, body, and glans of the penis. It is slightly dilated near its origin (intrabulbar fossa) and termination (navicular fossa). The two bulbourethral glands (which are situated bilaterally in the sphincter urethrae and behind the membranous urethra) open into the proximal portion of the spongy urethra. The external urethral orifice is the narrowest portion of the entire urethra.

Vessels and nerves

The artries are derived from inferior vesical and internal pudental arteries.

The veins drain into vesical and vaginal veins.

The nerves are from the pelvic plexus and pudental nerves.

RENAL CALCULUS

· Renal Calculus, commonly known as Kidney Stone is a solid concretion or crystal aggregation formed in the kidneys from dietary minerals in the urine.

About 80% of those with kidney stones are men. Men most commonly experience their first episode between 20-30 years of age, while for women the age at first presentation is somewhat later.

Normally, urine contains chemicals that prevent the crystals from forming. These inhibitors do not work for everyone and therefore some people form stones. If the crystals remain tiny, they travel through the urinary tract and pass out of the body via urine without causing any symptoms.

The biggest risk factor for kidney stones is not drinking enough fluids.

Classification

Kidney stones are typically classified by their location or chemical composition.

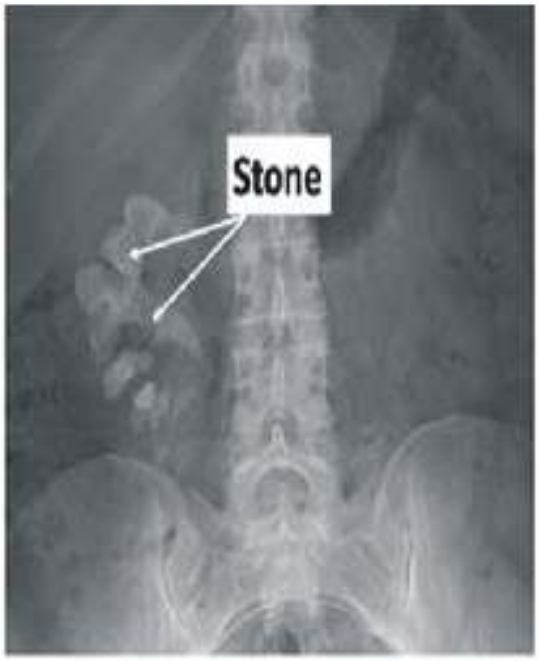
Kidney stones by location

Nephrolithiasis (In the kidney)

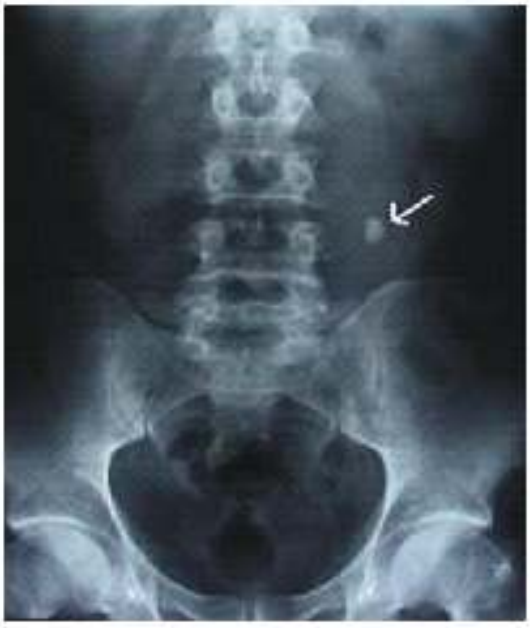
Ureterolithiasis (Ureter)

Cystolithiasis (Bladder)

Renal calculus Right



Renal calculus Left



Kidney stones by chemical composition

Calcium-containing

Struvite

Uric acid

Cystine

Other compounds

Stones can form when urine contains too much of certain substances. These substances can create small crystals that become stones. The stones take weeks or months to form.

Calcium stones

Most common. They are more common in men between age 20 - 30.

Nearly 80 out of 100 kidney stones (80%) are made of calcium compounds, especially calcium oxalate.[1] Calcium phosphate and other minerals also may be present.

Conditions that cause high calcium levels in the body, such as hyperparathyroidism, increase the risk of calcium stones.

High levels of oxalate also increase the risk for calcium stones.

Calcium Phosphate Stones are formed when other underlying health conditions are present, especially **renal tubular acidosis (RTA).**

They usually have a smooth surface, are hard and grow to a large size and can damage the kidneys.

Oxalate stones

Oxalate is present in certain foods such as spinach. It's also found in vitamin C supplements.

Diseases of the small intestine increase the risk of these stones.

Cystine stones

Can form in people who have cystinuria. This disorder runs in families and affects both men and women.

Struvite stones

About 10 to 15 out of 100 kidney stones (10% to 15%) are struvite stones.[1]

They can also be called **infection stones** if they occur with kidney or urinary tract infections (UTIs). These types of kidney stones sometimes are also called staghorn calculi if they grow large enough.

Struvite stones can be serious, because they are often large stones and may occur with an infection.

Women are affected more than men because of their higher risk of urinary tract infections.

These stones can grow very large and can block the kidney, ureter, or bladder.

Uric acid stones

About 5 to 10 out of 100 kidney stones (5% to 10%) are made of uric acid, a waste product normally passed out of the body in the urine. common in men than in women.

Occur in people who have

- Low urine output.
- A diet high in animal protein, such as red meat.
- An increase in how much alcohol you drink.
- Gout.
- Inflammatory bowel

Symptoms

Symptoms doesnot occur until the stones move down the tubes (ureters) through which urine empties into bladder. When this happens, the stones can block the flow of urine out of the kidneys.

The hallmark of stones that obstruct the ureter or renal pelvis is excruciating, intermittent pain that radiates from the flank to the groin or to the genital area and inner thigh.[1] This particular type of pain, known as renal

colic, is often described as one of the strongest pain sensations known. Pain may move to groin area (groin pain) or testicles (testicle pain)

Renal colic caused by kidney stones is commonly accompanied by urinary urgency, restlessness.

Ureteral obstruction causes postrenal azotemia and hydronephrosis (distension and dilation of the renal pelvis and calyces), as well as spasm of the ureter. This leads to pain, most commonly felt in the flank (the area between the ribs and hip), lower abdomen, and groin (a condition called renal colic).

Renal colic can be associated with nausea, vomiting, fever, blood in the urine, pus in the urine, and painful urination.

Other symptoms can include:

- Abnormal urine colour
- Blood in the urine
- Chills
- Fever
- Nausea
- Vomiting

Mechanical cause

Three mechanisms are currently thought to contribute to urinary stone formation. They are,

i) Precipitation - Crystallization from supersaturated solutions

ii) Absence of inhibits of stone formation normally present in urine

iii) Presence of macromolecular matrix

Precipitation of a substance to form stones depend on many factors including solubility, concentration and urine characteristics i.e., pH 7.

Normal constituents of urine that inhibit stone formation include citrate, pyrophosphate and magnesium. Reduced concentration of these substances contribute to stone formation. The disease caused by renal calculi is 'Gout'. It forms the urate calculus.

Pathogenesis of stones

Urinary stones usually arise because of the breakdown of a delicate balance. The kidneys must conserve water, but they must also excrete materials that have a low solubility. These two opossing requirements must be balanced during adaptation to a particular combination of diet, climate and activity. The problem is mitigated to some extent by the fact that urine contains

substances that inhibit crystalization of calcium stones and others that bind calcium in soluble complexes. But these protective mechanisms are less than perfect. When the urine becomes supersaturated with insoluble materials, because excretion rates are excessive and / or because water conservation is extreme, crystals from and may grow and aggregate to form a stone.

Supersaturation

In a solution in equilibrium with crystals of calcium oxalate, the product of the chemical activities of the calcium oxalate ions in the solution in termed the equilibrium solubility product, because it is the activity product that is unique to the equilibrium condition.

If the crystals are removed, and if either calcium or oxalate, ions are added to the solution, the activity product will increase, but the solution may remain clear, no new crystals form. Such a solution is considered to be metastably supersaturated. If new calcium oxalate seed crystals are now added, they will grow in size, usually the activity product reaches a critical value at which a solid phase begins to develop spontaneously. This value is called the upper limit of metastability or the formation product. Stone growth in the urinary tract requires a urine that, on the average, is above the equilibrium solubility product. Persistance of a stone requires and average activity product at least equal to the solubility product. Execessive supersaturation is common in stone formation.

Urine supersaturation can be increased by dehydration or by over excretion of calcium, oxalate or phosphate. Supersaturation of the urine with cystine or uric acid also occurs, when over excretion of the urine or low urine volume is present. Urine pH can also be an important factor. Phosphate and uric acid are weak acids that dissociate readily over the physiological range of pH.

Nucleation

Homogeneous nucleation

In urine that is supersaturated with respect of calcium oxalate, these two ions form clusters. The higher the supersaturation, the larger and more numerous the clusters become. Most small clusters eventually disperse because the internal forces that hold them together are too weak to overcome the random tendency of ions to move away. Clusters of over 100 ions can remain stable because attractive forces balance surface looses. Once they are stable, nuclei can grow at levels of supersaturation below that needed for their creatine. The formation product marks the point at which stable nuclei become frequent enough to create a permanent solid phase.

Heterogenous nucleation

If a supersaturated urine is seeded with performed nuclei of a crystal that is similar in structure to calcium oxalate, calcium and oxalate ions in solution will bind to the crystal's surface as they would upon a seed crystal of

calcium oxalate itself. The organised growth of one crystal on the surface of another is called epitaxial growth, and the seeding of a supersaturated solution of foreign nuclei is called heterogenous nucleation. Sodium, hydrogen, urate, uric acid and hydroxyapatite crystals can serve as heterogenous nuclei that permit calcium oxalate stones to form even though urine calcium oxalate supersaturated never exceeds the metastable limit.

Inhibitors of crystal growth and aggregation

Stable nuclei must grow and aggregate to produce a stone of clinical significance. Urine contains potent inhibitors of both of these processes of calcium oxalate and calcium phosphate but not for uric acid, cystine are struvite. Inorganic pyrophosphate is more than calcium oxalate crystal. Other urine components that appear to be glycoproteins inhibit the growth of calcium oxalate crystals. Slowing of crystals growth increases the apparent upper limit of metastability, because a consequence of the presence of these inhibitors, crystal growth in urine is slow compared with growth in simple salt solutions, and the upper limit of metastability is higher. Urine citrate may also inhibit crystal growth or nucleation.

Tests

· The diagnosis of kidney stones is made on the basis of information obtained from the history, physical examination, urinalysis, and radiographic studies. Ultrasound examination and blood tests may also aid in the diagnosis.

Blood tests to check calcium, phosphorus, uric acid, and electrolyte levels

Kidney function tests

Urinalysis to see crystals and look for red blood cells in urine

Examination of the stone to determine the type

Stones or a blockage can be seen on:

· Abdominal CT scan

· Abdominal/kidney MRI

· Abdominal x-rays

· Intravenous pyelogram (IVP)

· Kidney ultrasound

· Retrograde pyelogram

Ureteric calculi

Form from crystalline aggregates of organic molecules· Life time risk of developing a ureteric calculus is about 5%· Occur most commonly in men aged between 30 - 60 years· 90% are idiopathic· 10% are due to· Hyperparathyroidism§ Vitamin D excess§ Primary hyperoxaluria· Recurrence rate at 10 years is about 50%·

Overall, 60% of patients with a ureteric calculus will pass the stone spontaneously within 4 weeks and without the need for urological intervention. ·

90% of patients with ureteric calculi will have blood in their urine (visible or microscopic).·

70% of ureteric calculi are already in the lower third of the ureter by the time of presentation.

Chemical composition·

Calcium oxalate (40%)·

Calcium phosphate (15%)·

Mixed oxalate / phosphate (20%)·

Struvite (15%)

Uric acid (10%)

Clinical features·

Stones usually present with pain due to obstruction of urinary flow.

May cause few symptoms or may present with typical ureteric colic·

Ureteric colic typically is severe colicky loin to groin pain.

Pain may radiate into scrotum in men and labia in women.

May also cause frequency, urgency and dysuria·

Pain may settle with passage of the stone or if stone fails to migrate·

Abdominal examination is usually unremarkable·

Microscopic haematuria is often present

Differential diagnosis·

The differential diagnosis included renal and non-renal causes·

Renal causes include:

i) Cystitis and urinary tract infection

Although symptoms like frequent micturation, dysuria, microscopic or visible haematuria are present in cystitis and urethritis, the typical ureteric colic pain (i.e. pain radiating from loin to groin) is present in renal calculus (supra pubic pain during and after voiding) is present in cystitis, desire to pass more urine after micturation, due to spasm of the inflammed bladder wall is present in cystitis is not usually a symptom of calculi.

ii) Pyelonephritis

Acute onset of pain in loin radiating to iliac fossae and suprapubic area, tenderness in lumbar region, dysuria, vomiting are present in pyelonephritis, resembling renal calculus, but fever associated with rigors, urine examination showing neutrophils, organisms, tubular epithelial cells are not usually present in renal calculus.

iii) Perinephric abscess

Marked pain and tenderness are present in this disease. But the patient will be extremely ill with fever, leucocytosis and positive blood cultures. Urinary symptoms are usually absent and the urine contains neither pus cells or organisms.

Non-renal causes include:

Appendicitis

Ectopic pregnancy

Salpingitis

Torted ovarian cyst

Abdominal aortic aneurysm

Investigation·

The following investigations should be considered

Midstream urine specimen

KUB plus ultrasound

Intravenous urogram (IVU)

Complications·

Complications of ureteric calculi include:

Obstruction

Ureteric strictures

Infection

Acute infection in an obstructed kidney is a urological emergency·

Patient is usually unwell with loin pain, swinging pyrexia and dysuria.

Without drainage, rapid renal destruction may occur.

Chronic infection with urease-producing organisms (e.g. Proteus) precipitates stone formation.

Magnesium ammonium phosphate or staghorn calculi result.

Staghorn calculi can lead to a deterioration in renal function

Management

Check serum electrolytes and calcium.

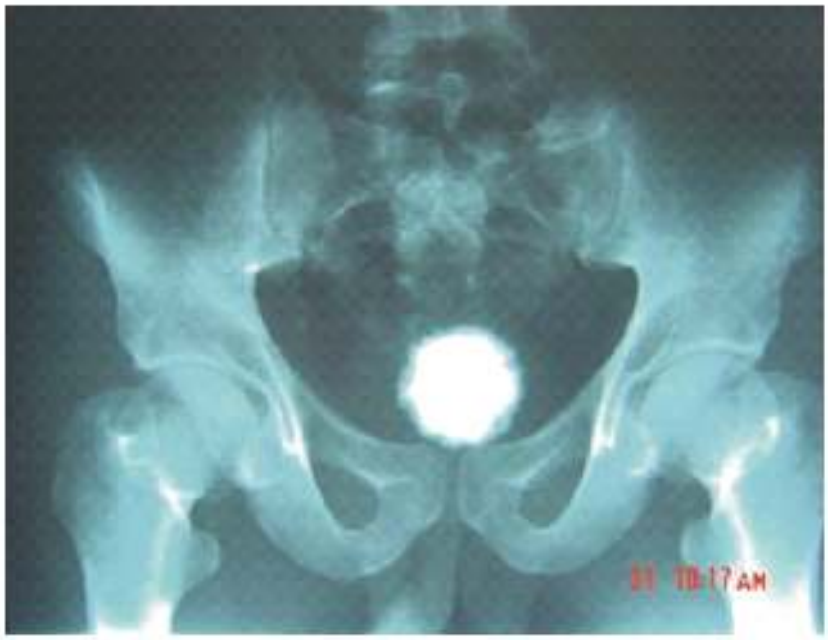
Urinalysis will normally show microscopic haematuria· IVU to confirm diagnosis and ureteric obstruction· **Most stones < 5 mm in diameter pass spontaneously**

If total obstruction occurs in the presence of infected urine need urgent decompression.

Bladder Stone

Vesical calculus or **cystolith** is a solid concretion or crystal aggregation found in the urinary bladder.

Vesical calculus



Causes

· Bladder stones may occur whenever the kidneys, bladder, or ureters become inflamed.

· The use of urinary catheters may cause a bladder stone.

Individuals who are paralyzed or are unable to adequately pass urine may require the use catheters placed into the bladder. The use of these tubes may lead to an infection, which irritates the bladder, resulting in stone formation. Finally, a kidney stone may travel down the ureter into the bladder and become a bladder stone.

· Bladder stones are somewhat more common in men who have prostate enlargement. The large prostate presses on the urethra and makes it difficult to pass urine. Over time stagnant urine collects in the bladder and minerals like calcium start to precipitate.

· Other individuals who develop bladder stones had spinal cord injury, paralysis or some type of nerve damage. When nerves to the back are damaged, the bladder cannot empty and stagnant urine results.

Signs and symptoms

Bladder stones are small particles that can form in the bladder. In most cases bladder stones develop when the urine becomes very concentrated or

when one is dehydrated. This allows for the minerals like calcium or magnesium to crystallize and form stones.

Bladder stones vary in number size and consistency. In some cases bladder stones do not cause any symptoms of signs and are discovered as an incidental finding on a plain radiograph. when symptoms do occur these may include

- fever.
- severe lower abdominal and back pain.
- difficult urination,/ frequent urination at night.
- painful urination and blood in the urine.
- The pain may also be associated with nausea, vomiting and chills.

Diagnosis

The diagnosis of bladder stone includes urinalysis, ultrasonography, X rays or cystoscopy) The intravenous pyelogram can also be used to assess the presence of kidney stones.

CT scans are more sensitive and can identify very small stones not seen by other tests.

Diet for Kidney stones

Diet for Calcium Stones

It is better to avoid foods and beverages such as coffee, chocolate, and fast foods.

Vitamin B6 is also reported to reduce urinary calcium.

AVOID Oxalate-rich foods include spinach, colocasia, beets, nuts, chocolate, black tea, coffee, chocolate milk, dark beers, soy drinks and some fruit juices. It is also in butters, wheat bran, whole wheat flour, bran cereals, berries, rhubarb, figs, citrus peel,green leafy vegetables, beans, potatoes and sweet potatoes, peppers.

Diet for Uric Acid Stones

Food rich in uric acid includes meats, sweet breads. Meats rich in purines converts into uricacid. Individuals with uric acid stones or those at risk for kidney stones limit themselves of *meat* ,liver, kidney and brain, meat extracts and broths, gravy made from meat.

1. Drink plenty of fluid

- Drink more fluid, especially water helps to flush out the kidneys and dilute stone-forming substances, making stones less likely to form.
- Drink at least 2- 3 litres, or 10 cups, of fluid daily.
- Have a cup of fluid (250mL) each hour during waking hours, and a large glass of water before going to bed.
- Drink a glass of water if you wake up during the night.
- Spread out your fluid intake during the day.

- AVOID strong black tea and orange, juice, as these are high in oxalates.
- Avoid grape fruit juice,softdrink, Drink 100ml of lemon juice daily (could be added to water).

2. Limit salt

Limit sodium intake to less than 2300mg per day.

To reduce salt /sodium:

Buy fresh foods, or foods without salt - fruit, fresh vegetables, fresh meats, chicken, fish, eggs, porridge, rice, pasta most sodium (75%) comes from processed foods.

- Limit processed foods high in salt e.g. soup, processed meats, sauces, gravy, crisps and snack.
- "low salt" or "no added salt" foods are the best choices.

Surgical Treatments

Depending upon the location of the stone, either operative or endoscopic approach is chosen. Endoscopic method is preferred for stones located distal to the bladder. Some of the non-operative techniques devised are extra-corporeal shock wave lithotripsy(ESWL), precutaneous nephrolithotomy (PCNL) and Cystolithotripsy. These also cause side effects such as haemorrhage, hypertension , tubular necrosis and subsequent fibrosis of the kidney.

MATERIALS AND METHODS

MATERIALS AND METHODS

A clinical study on "The evaluation of efficacy of the trial medicine namely, **Aruvagai Chooranam (Internal)** in treating **Kalladaippu noi**", was undertaken at the Post Graduate Department of Pothu Maruthuvam, Government Siddha Medical College and Hospital, Palayamkottai. For the study, a total of 40 patients of either sex (20 Out-Patients and 20 In-Patients), suffering from Kalladaippu noi were selected and administered the said trial medicine towards treating the disease. The patients, both in-patients and out-patients were selected after diagnosing the Kalladaippu noi, through clinical, pathological, biochemical and microscopic examination. In addition, Ultra-Sonogram was also done for all the patients and radiological investigation was carried out for the selected cases to confirm the occurrence of Kalladiappu noi, diagnosed through the above mentioned routine methods. After discharging the in-patients from the IP ward, treatment with the trial medicine was continued in the OP Department as follow-up cases.

Preparation of trial medicines

The trial medicine, Aruvagai Chooranam (Internal) is selected based on their medicinal values in treating Kalladaippu noi, mentioned in the Siddha Literature, Brahmamuni Vaidhya Soothiram - 390, Part - I, Page no. - 120,

Edition - II. The ingredients were collected, purified and medicine were prepared, stored and given to the patients based on the reference cited above.

Pharmacological analysis of the trial medicine

Pharmacological actions of the trial medicine were studied at KM College of Pharmacy Madurai. Experiments were conducted with albino rats (for lithotriptic and diuretic activity) by following the standard procedures to determine the pharmacological actions like Lithiatic and diuretic effect of the trial medicine. The procedures, results and inferences are given in detail in **Annexure – I**.

Biochemical analysis of the trial medicine

Biochemical analyses of the trial medicine were carried out at the Biochemistry Unit of Government Siddha Medical College, Palayamkottai. Experiments were conducted by the unit by following the standard procedures to know the presence of minerals like Calcium, Sulphate, Chloride, Carbonate, Starch, Ferric Iron, Ferrous Iron, Phosphate, Albumin, Tannic Acid, Unsaturated Compound, Reducing sugar, Amino Acid and Zinc. The results of the biochemical analysis and inferences are given in **Annexure – II**.

Criteria for the selection of patients

For the present study, patients were selected based on the following criteria.

i. Radiological report / Ultra-Sonogram report, indicating the presence of Renal Calculi

ii. Urine analysis report, indicating the presence of crystals, albumin and RBC depositions in the urine

iii. Past history of Renal Calculi

iv. Clinical history of patients with the following symptoms

- Renal colicky pain in loin, renal angle and lower abdomen
- Pain radiating from loin to groin, thigh and external genitalia
- Abdominal distension
- Burning micturation
- Obstruction during micturation
- Anuria
- Oliguria
- Concentric urination
- Haematuria
- Pyuria
- Nausea
- Vomiting
- Fever & Chills
- Sweating

Collection and maintenance of Patients' database

A proforma was prepared to collect details about the patients' personal and family history, present symptoms, history of recent and past illness, laboratory investigation (including urine and blood analysis), Ultra-Sonogram, method adopted for disease treatment and management and follow-up actions. The details collected were recorded in proforma for each individual patient and database was maintained for all the patients.

Investigation of Kalladaippu noi patients

The patients were subjected to the following investigations to establish the diagnosis. The investigations were carried out regularly before and after the treatment.

i) Urine examination

The urine of patients was subjected to microscopic investigations with regard to the colour, specific gravity, sugar, albumin, RBCs, cast, pus cells, epithelial cells, crystals and other pathological constituents.

ii) Biochemical examination of blood

The blood of patients was tested biochemically to estimate the blood urea and creatinine level to know the present functional status of kidney and its excretion.

iii) Radiography (Plain X-Ray Abdomen KUB)

Some of the patients were subjected to radiological examination like X-Ray KUB.

iv) Ultra-Sonogram (USG Abdomen KUB)

All the patients were subjected to USG Abdomen KUB before and after the treatment.

v) Analysis of kidney stones

Knowing the chemical composition of the stone helps the doctor identify why the patient is prone to stone formation. The kind of stone a person's body makes determines what dietary changes may be needed. For example, limiting oxalate in the diet may help prevent calcium oxalate stones but will do nothing to prevent uric acid stones. Some dietary recommendations may apply to more than one type of stone. Most notably, drinking enough water helps prevent all kinds of kidney stones. In the present study, the kidney stones collected by some of the patients during the course of treatment were analysed in a well reputed medical laboratory to determine the types of stones. The stone analysis reports are given in **Annexure – IV**.

Criteria for measuring the positive outcome of the study

The positive outcomes of the study included removal of stones with urine, removal of disintegrated stones in the form of sand grains with urine, absence of crystals, albumin and RBC depositions in urine (evident from urine

analysis report), absence of stones (evident from USG report), complete relief from / reduction in severity of symptoms like colicky pain, nausea/vomiting, haematuria, pyuria and dysuria. The patients were said to be “cured and symptom free patients” based on the above mentioned criteria for the positive outcomes.

OBSERVATION AND RESULTS

OBSERVATION AND RESULTS

The results obtained from the present study were recorded in the proforma with respect to the following parameters for each patient both out-patients and in-patients. They were analysed statistically to arrive at the percentage composition.

1. Age
2. Sex
3. Religion
4. Occupation
5. Socio-economic status
6. Food habits
7. Personal habits
8. Aetiological factors
9. Thinai
10. Kaalangal
11. Paruvakaalam
12. Thegi (Constitution of body)
13. Mukkutram
    A. Derangement of Vatham
    B. Derangement of Pitham
    C. Derangement of Kabam
14. Udal Thathukkal
15. Envagai Thervugal
16. Neerkuri
17. Neikuri
18. Duration of illness
19. Clinical manifestations
20. Incidence of various types of calculi
21. Urine analysis
22. Ultra sonogram
23. Stone analysis
24. Case details and Laboratory investigations
    A. Out-Patients
    B. In-Patients
25. Grading outcomes of the study

Age

Sl. No.	Age (in years)	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	21 – 30	1	5	3	15
2.	31 – 40	8	40	3	15
3.	41 – 50	10	50	1	5
4.	51 – 60	1	5	11	55
5.	Above 60	-	-	2	10

In the present study, in out-patients, Kalladaippu noi was found to be most common in the age group, 41 – 50 years, and, in in-patients, it was predominant in the age group between, 51 - 60 years.

Sex

Sl. No.	Sex	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	Male	13	65	9	45
2.	Female	7	35	11	55

The above table shows most of the out-patients were males and in-patients were females.

Religion

Sl. No.	Religion	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	Hindu	15	75	20	100
2.	Christian	2	10	-	-
3.	Muslim	3	15	-	-

It is observed from the above table that majority of the patients were Hindus and the rest were Christians and Muslims.

Occupation

Sl. No.	Age (in years)	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	Farmer	1	5	2	10
2.	Coolie	2	10	4	20
3.	Driver	2	10	1	5
4.	Private jobs	7	35	2	10
5.	Govt. employee	3	15	-	-
6.	Home maker	5	25	10	50
7.	Gold Smith	-		1	5

It is understood from the above table that most of the OP were holding private jobs and IP were Home makers.

Socio-economic status

Sl. No.	Occupation	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	Rich	5	25	-	-
2.	Middle class	8	40	14	70
3.	Poor	7	35	6	30

The above mentioned table shows that most of the patients, both OP and IP were hailing from the middle class families.

Food Habits

Sl. No.	Diet	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	Vegetarian	2	10	3	15
2.	Mixed diet	18	90	17	85

The above mentioned table shows majority of the patients were taking mixed food, containing both vegetarian and non-vegetarian items.

Personal Habits

Sl. No.	Habits	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	Alcohol intake	3	15	2	10
2.	Smoking	3	15	4	20
3.	Both alcohol & smoking	3	15	4	20
4.	Tobacco / Betel chewing	2	10	2	10
5.	No bad habits	9	45	8	40

It is observed from the above table that only about 45 % of OP and 40% of IP were found to have no bad habits. The rest were having bad habits like drinking alcohol, smoking, tobacco and betel chewing.

Aetiological factors

Sl. No.	Aetiological factors	Out-Patients		In-Patients	
		Number of cases	%	Number of cases	%
1.	Family History	-	-	-	-
2.	Previous History	3	15	6	30
3.	Recurrent UTI	-	-	-	-
4.	Others	17	85	14	70

The result shows that about 15% of OP and 30% of IP had previous history of Kalladaippu noi. Others might have got Kalladaippu noi due to drinking contaminated water / hard water, inadequate intake of water, altered food habits, poor health awareness, suppressing seminal discharge etc.,

Thinai

Sl. No.	Thinai	Out-Patients		In-Patients	
		Number of cases	%	Number of cases	%
1.	Kurinchi	-	-	-	-
2.	Mullai	-	-	-	-
3.	Marutham	19	95	20	100
4.	Neithal	1	5	-	-
5.	Paalai	-	-	-	-

In this study, it is learnt from the above table that majority of the out-patients and all the in-patients were from Marutha Nilam.

Mukkutra Kaalam

Sl. No.	Kaalam (in years)	Out-Patients		In-Patients	
		Number of cases	%	Number of cases	%
1.	Vaatha Kaalam (0 – 33)	2	10	3	15
2.	Pitha Kaalam (34 – 66)	18	90	16	80
3.	Kaba Kaalam (67 – 100)	-	-	1	5

From the above table, it is understood that most of the out-patients and in-patients came under Pitha Kaalam.

Paruvakaalam

Sl. No.	Kaalam	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	Kaar Kaalam	10	50	4	20
2.	Koothir Kaalam	2	10	15	75
3.	Munpani Kaalam	-	-	-	-
4.	Pinpani Kaalam	-	-	-	-
5.	Ilavenil Kaalam	-	-	-	-
6.	Mudhuvenil Kaalam	8	40	1	5

The result reveals that Kalladaippu noi was more commonly seen in karkalam (OP). and in Koothikalam (IP)

Thegi (Constitution of body)

Sl. No.	Kaalam	Out-Patients		In-Patients	
		Number of cases	%	Number of cases	%
1.	Vatha Thegi	5	25	5	25
2.	Pitha Thegi	13	65	15	75
3.	Kapa Thegi	2	10	-	-

The result shows that Pitha thegi patients were affected by Kalladaippu noi more than others.

Mukkutram

A. Derangement of Vatham

Sl. No.	Types	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	Praanan	-	-	-	-
2.	Abaanan	20	100	20	100
3.	Viyaanan	6	30	7	35
4.	Uthaanan	6	30	4	20
5.	Samaanan	20	100	20	100
6.	Naagan	-	-	-	-
7.	Koorman	-	-	-	-
8.	Kirugaran	-	-	-	-
9.	Devathathan	-	-	-	-
10.	Dananjayan	-	-	-	-

It is known from the above table that all the patients both OP and IP had disturbances in Abanan and Samanan. Only a few patients had disturbances in Viyanan and Uthanan.

B. Derangement of Pitham

Sl. No.	Types	Out-Patients		In-Patients	
		Number of cases	%	Number of cases	%
1.	Anarpitham	-	-	-	-
2.	Ranjagam	-	-	-	-
3.	Pirasagam	-	-	-	-
4.	Sadhagam	20	100	20	100
5.	Alosagam	-	-	-	-

The table states that Sadhaga pitham was affected in all the patients.

C. Derangement of Kapam

Sl. No.	Types	Out-Patients		In-Patients	
		Number of cases	%	Number of cases	%
1.	Avalampagam	-	-	-	-
2.	Kilethagam	-	-	-	-
3.	Pothagam	-	-	-	-
4.	Tharpagam	-	-	-	-
5.	Santhigam	3	15	7	35

The study suggests that only santhigam was affected in 3 of the out patients and 7 of the in patients.

Udal Thathukkal

Sl. No.	Types	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	Saaram	20	100	20	100
2.	Senneer	-	-	1	5
3.	Oon	-	-	-	-
4.	Enbu	-	-	-	-
5.	Kozhuppu	-	-	-	-
6.	Moolai	-	-	-	-
7.	Sukkilam / Suronitham	-	-	-	-

It is learnt from the above table only saram was affected in all the patients.

Envagai Theervugal

Sl. No.	Types	Out-Patients		In-Patients	
		Number of cases	%	Number of cases	%
1.	Naa	-	-	1	5
2.	Niram	-	-	-	-
3.	Mozhi	-	-	-	-
4.	Vizhi	-	-	1	5
5.	Malam	-	-	-	-
6.	Moothiram	20	100	20	100
7.	Naadi				
	i) Vatha pitham	16	80	15	75
	ii) Vatha kapam	-	-	-	-
	iii) Pitha vatham	4	20	5	25
	iv) Pitha kapam	-	-	-	-
	v) Kapa vatham	-	-	-	-
	vi) Kapa pitham	-	-	-	-
8.	Sparisam	-	-	-	-

The table clearly states that only moothiram was affected in all the patients and vatha pitha naadi was observed in most of the patients.

Neerkuri

Sl. No.	Types	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	Niram (Colour)				
	Normal	6	30	5	25
	Yellowish	16	80	14	70
	Yellowish Red	-	-	3	15
2.	Edai (Specific				
	Normal	20	100	20	100
	Increased	-	-	-	-
	Decreased	-	-	-	-
3.	Manam (Smell)				
	Normal	5	25	8	40
	Tamarind Smell	13	65	10	50
	Foul Smell	2	10	2	10
4.	Nurai (Frothy)				
	Normal	20	100	20	100
	Increased				
	Less Frothy				
5.	Enjal (Quantity)				
	Increased	1	5	2	10
	Decreased	14	70	13	65
	Normal	5	25	5	25

The above table shows that colour of urine was yellowish, smell was like tamarind in most of the patients. Nurai and edai were normal in all the patients. Enjal was decreased in most of the patients.

Neikuri

Sl. No.	Types	Character	Out-Patients		In-Patients	
			No. of	%	No. of cases	%
1.	Vatha Neer	Lengthens like a snake	6	30	9	45
2.	Pitha Neer	Spreads like a ring	12	60	8	40
3.	Kapa Neer	Resembles a pearl	2	10	3	15

The Neikuri shows that in majority of the patients, pitha neer spread like a ring.

Duration of illness

Sl. No.	Duration	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	Less than 1 month	6	30	-	-
2.	Between 2 – 6 months	11	55	16	80
3.	Between ½ - 1 year	3	15	3	15
4.	Between 1 – 1½ years	-	-	1	5
4.	Between 1 – 2 years	-	-	-	-
5.	Between 2 – 3 years	-	-	-	-

It is learnt from the table that majority of the patients experienced symptoms of Kalladaippu noi only in the previous 2-6 months period.

Clinical manifestations

Sl. No.	Symptoms	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	Renal colicky pain	20	100	20	100
2.	Abdominal distension	4	20	6	30
3.	Burning micturation	17	85	16	80
4.	Obstruction during micturation	9	45	7	35
5.	Anuria	-	-	-	-
6.	Oliguria	15	75	13	65
7.	Concentric urination	12	60	13	65
8.	Haematuria	-	-	3	15
9.	Pyuria	20	100	18	90
10.	Nausea & Vomiting	7	35	8	40
11.	Fever & Chills	-	-	-	-
12.	Sweating	-	-	1	5

The study shows that all the patients experienced renal colicky pain and burning micturation. More than 50% of the patients experienced oliguria, concentric urination and obstruction during micturation.

Incidence of various types of calculi

Sl. No.	Types	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	Renal Calculi	10	50	17	85
2.	Renal with Ureteric Calculi	4	20	3	15
3.	Vesical Calculi	-	-	-	-
4.	Ureteric Calculi	4	20	-	-
5.	Ureteric Calculi with Hydro-ureteronephrosis	1	5	-	-
6.	Renal, Ureteric Calculi with Hydro-ureteronephrosis	1	5	-	-

Ultrasonographic investigations done before the treatment shows that the majority of the patients suffered from presence of renal calculi.

Urine analysis

Sl. No.	Constituents of urine	Before Treatment				After Treatment			
		Out-Patients		In-Patients		Out-Patients		In-Patients	
		Number of cases	%	Number of cases	%	Number of cases	%	Number of cases	%
1.	Albumin	1	5	5	25	-	-	1	5
2.	Sugar	1	5	1	5	-	-	-	5
	Deposits								
1.	Pus cells	16	80	18	90	1	5	2	10
2.	Epithelial cells	4	20	3	15	-	-	-	-
3.	RBCs	4	20	3	15	-	-	-	-
4.	Cast / Crystals	-	-	2	10	-	-	-	-

The laboratory investigations done before treatment revealed that most of the patients had pus cells in their urine and only few had epithelial cells, RBCs and cast / crystals.

Ultra-sonography report

Sl. No.	Location of Calculus	Before Treatment				After Treatment			
		Out-Patients		In-Patients		Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%
1.	Renal Calculi	10	50	13	65	2	10	3	15
2.	Renal with Ureteric Calculi	4	20	4	20	-	-	1	5
3.	Vesical Calculi	0	-	0	0	-	-	-	-
4.	Ureteric Calculi	4	20	3	15	-	-	-	-
5.	Ureteric Calculi with Hydro-ureteronephrosis	1	5	0	0	1	5	-	-
6.	Renal, Ureteric Calculi with Hydro-ureteronephrosis	1	5	0	0	1	5	-	-

Ultrasonographic investigations done after the treatment shows that, majority of the patients had no calculus and were free from symptoms of Kalladaippu noi.

Stone analysis

Sl. No.	OP / IP No.	Name	Age / Sex	Composition of stone
1.	OP No. 59399	Mr. Velayutham	41 / Male	Calcium oxalate and urate
2.	OP No. 64882	Mr. Chelladurai	33 / Male	Calcium oxalate and urate
3.	OP. No. 78119	Mr. Ganabathy	50 / Male	Calcium oxalate and urate

Three stones are received from three different patients at the end of the treatment and stones were analysed in a renowned laboratory to ascertain the composition of stones. The analysis of the stones revealed the presence of calcium oxalate and uric acid. The stone analysis reports of all the three patients are enclosed as **Annexure V.**

Grading outcomes of the study

Sl. No.	Response	Out-Patients		In-Patients	
		No. of cases	%	No. of cases	%
1.	Good	16	80	13	65
2.	Moderate	3	15	7	35
3.	Poor	1	5	-	-

It is understood from the above table that good response was noticed is in 80 % of OP and 65% of IP and moderate response in 15% of OP and 35% of IP. Hence, it can be concluded that the trial medicine, Aruvagai Chooranam is very effective in curing Kalladaippu noi.

CASE DETAILS - OUT - PATIENTS							
Sl.No	**O.P.No**	**Name**	**Age/Sex**	**Course of treatment**		**No of days treated**	**Results**
1	45406	Mr.kather batcha	32/M	6/18/2012	8/21/2012	64	Good
2	45651	Mrs. Eissakiammal	36/F	6/19/2012	9/13/2012	86	Fair
3	46023	Mrs.Sairabanu	35/F	6/20/2012	9/13/2012	85	Good
4	46256	Mrs. Saroja	50/F	6/21/2012	8/30/2012	70	Good
5	46421	Mr. Soundrarajan	43/M	6/21/2012	7/11/2012	20	Fair
6	46555	Mrs. Padmavathy	37/F	6/29/2012	8/10/2012	42	Good
7	52030	Mr.Kathiravian	44/M	7/10/2012	9/13/2012	65	Good
8	52573	Mr.Sundravel	37/M	7/12/2012	10/31/2012	111	Good
9	52651	Mr. Sunmugasundram	53/M	7/2/2012	8/23/2012	52	Good
10	53229	Mr.Kumaravel	45/M	7/14/2012	10/26/2012	104	Good
11	56437	Mr.Sureshperumal	28/M	7/25/2012	11/2/2012	99	Fair
12	58623	Mr.Ezhilan	43/M	8/2/2012	8/30/2012	28	Poor
13	59399	Mr.velayutham	41/M	8/4/2012	9/11/2012	38	Good
14	60853	Mr.Buhari	40/M	8/9/2012	11/18/2012	101	Good
15	64882	Mr.Chelladurai	39/M	8/23/2012	11/8/2012	77	Good
16	64848	Mr.Jayakani	48/M	8/23/2012	11/2/2012	71	Good
17	64978	Mrs.Kandhimathi	37/F	8/23/2012	11/2/2012	71	Good
18	69425	Mr.Danaraj	42/M	9/6/2012	11/18/2012	73	Good
19	71797	Mrs.Usha	45/F	9/13/2012	12/4/2012	82	Good
20	78119	Mr.Ganapathi	50/M	10/2/2012	11/6/2012	35	Good

LABORATORY INVESTIGATION - OUT - PATIENTS															
Sl.No	O.P.No	TC (Cells/Cumm)		DC Cells (%)						ESR (mm)				Hb (%)	
		BT	AT	BT			AT			BT		AT		BT	AT
				P	L	E	P	L	E	1/2hr	1 hr	1/2hr	1 hr		
1	45406	8,200	8,400	64	30	6	66	32	2	1	3	1	2	13	13.2
2	45651	7,400	7,800	66	28	6	63	32	5	4	10	2	5	11.2	11.4
3	46023	8,000	7,800	59	37	4	64	33	3	4	8	2	4	10.2	10.4
4	46256	7,200	7,600	66	28	6	62	30	8	4	10	3	5	10.8	11
5	46421	8,100	8,300	57	40	3	59	33	8	7	15	4	6	11.5	11.8
6	46555	8,700	8,200	62	30	8	60	38	2	15	25	7	13	11.4	11.6
7	52030	6,000	6,500	63	33	4	62	31	7	2	4	2	3	13	13.2
8	52573	8,400	8,100	70	28	2	60	38	2	6	12	3	6	11.5	11.9
9	52651	7,200	7,800	62	36	2	60	35	5	6	13	2	8	13.5	14
10	53229	8,300	8,400	57	40	3	55	39	6	13	29	7	14	14	14.1
11	56437	8,300	8,000	57	40	3	60	37	3	2	5	1	3	11.5	11.9
12	58623	8,000	8,300	59	37	4	64	30	6	2	5	2	3	13.5	13.6
13	59399	7,900	8,000	62	34	4	55	39	6	5	12	3	6	13	13.4
14	60853	8,000	8,400	66	31	3	60	37	3	10	13	5	7	13	13.6
15	64848	7,100	7,500	66	30	4	60	34	6	8	12	3	4	13.5	13.6
16	64882	7,200	7,600	62	30	8	60	38	2	10	14	5	7	10.1	11
17	64978	9,000	8,800	63	33	4	62	35	3	25	30	10	20	11.2	11.7
18	69425	8,500	8,700	62	36	2	64	30	6	2	5	1	3	13	13.4
19	71797	8,700	8,300	64	34	2	63	32	5	6	14	4	8	13	13.6
20	78119	8,500	8,300	63	33	4	60	32	8	2	5	1	3	13.5	13.7

BT- Before Treatment, AT- After Treatment, TC- Total Count, DC- Differential Count, P- Polymorphs, E- Eosinophils, ESR- Erythrocyte Sedimentation Rate, Hb- Haemoglobin.

LABORATORY INVESTIGATION -(OUT - PATIENTS) - II											
Sl.No	O.P.No	Blood sugar (mgs %)		Blood Urea (mgs %)		Total Cholesterol (mgs %)		Serum Bilirubin (mgs %)		Serum Creatinine (mgs %)	
		BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
1	45406	72	90	18	20	122	125	0.8	0.8	0.5	0.4
2	45651	88	110	19	21	153	150	0.6	0.5	0.9	0.8
3	46023	65	87	15	17	110	113	0.7	0.7	0.4	0.4
4	46256	88	112	18	20	153	145	0.9	0.8	0.6	0.5
5	46421	90	105	21	18	140	143	0.4	0.4	0.7	0.6
6	46555	150	165	26	24	186	192	0.8	0.7	0.9	0.8
7	52030	99	112	21	23	160	166	0.6	0.7	0.8	0.7
8	52573	82	102	22	20	160	168	0.8	0.7	0.4	0.4
9	52651	97	110	19	22	169	172	0.7	0.8	0.6	0.5
10	53229	93	111	20	18	193	198	0.7	0.6	0.7	0.6
11	56437	76.5	97	26.8	22	146	148	0.6	0.5	1.3	0.9
12	58623	72	94	23	21	250	262	0.9	0.7	1.2	1.0
13	59399	77	87	19	21	132	130	0.7	0.6	0.4	0.4
14	60853	101	118	27.2	24	180	172	0.7	0.8	1.1	0.9
15	64848	103	123	24.6	22	260	265	1.0	0.8	1.8	1.5
16	64882	74	96	27	28	165	172	0.8	0.7	0.7	0.7
17	64978	94	102	30	32	170	176	0.6	0.5	0.8	0.6
18	69425	70	84	17	14	151	162	0.6	0.7	0.8	0.5
19	71797	162	170	19	20	175	180	0.6	0.4	0.6	0.6
20	78119	96	118	15	17	209	208	0.9	0.7	0.7	0.4

BT- Before Treatment, AT- After Treatment

LABORATORY INVESTIGATION -(OUT - PATIENTS) - III													
Sl.No	O.P.No	Urine Analysis											
		Before treament						After treament					
		Albumin	Sugar	Pus Cells	Epithelial Cells	RBC	Cast / Crystals	Albumin	Sugar	Pus Cells	Epithelial Cells	RBC	Cast / Crystals
1	45406	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
2	45651	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
3	46023	Nil	Nil	2 - 5	FEW	PRESENT	NAD	Nil	Nil	NAD	NAD	NAD	NAD
4	46256	Nil	Nil	2 - 3	NAD	PRESENT	NAD	Nil	Nil	NAD	NAD	NAD	NAD
5	46421	Nil	Nil	NAD	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
6	46555	Trace	Trace	2 - 3	NAD	PRESENT	NAD	Nil	Trace	I- 2	NAD	NAD	NAD
7	52030	Nil	Nil	I- 2	I- 2	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
8	52573	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
9	52651	Nil	Nil	NAD	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
10	53229	Nil	Nil	2 - 5	NAD	PRESENT	NAD	Nil	Nil	NAD	NAD	NAD	NAD
11	56437	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
12	58623	Nil	Nil	I- 2	FEW	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
13	59399	Nil	Nil	NAD	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
14	60853	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
15	64848	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
16	64882	Nil	Nil	2 - 3	I- 2	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
17	64978	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
18	69425	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
19	71797	Nil	Nil	NAD	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
20	78119	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD

CASE DETAILS - IN - PATIENTS							
Sl.No	**I.P.No**	**Name**	**Age/Sex**	**Course of treatment**		**No of days treated**	**Results**
1	2200	Mrs.Ramalakshmi	60/F	7/13/2012	8/17/2012	35	Good
2	2451	Mr.Parasivam	47/M	7/27/2012	8/22/2012	26	Fair
3	2606	Mrs.Balammal	60/F	8/8/2012	8/23/2012	15	Good
4	2625	Mrs.Subbammal	67/F	8/9/2012	9/6/2012	28	Good
5	2692	Mrs.Maniammal	43/M	8/14/2012	9/6/2012	23	Good
6	2725	Mrs.Lakshmi	37/F	8/18/2012	9/18/2012	31	Good
7	2801	Mr.Rajaram	53/M	8/28/2012	9/29/2012	32	Good
8	2960	Mr.Mandhiram	44/M	9/6/2012	10/5/2012	29	Good
9	2970	Mrs.Subbulakshmi	37/M	9/7/2012	9/27/2012	20	Good
10	2972	Mrs.Sudha	45/M	9/7/2012	9/27/2012	20	Good
11	3114	Mr.Nathchiar	28/M	9/19/2012	10/27/2012	38	Good
12	3199	Mr.Thankaraj	43/M	9/24/2012	10/8/2012	14	Good
13	3208	Mr.Muthuramalingam	41/M	9/24/2012	10/17/2012	23	Good
14	3505	Mrs.Pappa	40/M	10/10/2012	10/29/2012	19	Good
15	3511	Mrs.Gandhimathi	39/M	10/10/2012	10/29/2012	19	Good
16	3520	Mr.komban	48/M	10/11/2012	11/3/2012	23	Good
17	3523	Mr.Ramakrishnan	37/F	10/11/2012	11/9/2012	29	Good
18	3605	Mr.Arumugam	42/M	10/17/2012	11/6/2012	20	Good
19	3607	Mr.Raj	45/F	10/18/2012	11/6/2012	19	Good
20	3617	Mrs.Manonmani	50/M	10/18/2012	11/9/2012	22	Good

LABORATORY INVESTIGATION - IN - PATIENTS															
Sl.No	I.P.No	TC (Cells/Cumm)		DC Cells (%)						ESR (mm)				Hb (%)	
		BT	AT	BT			AT			BT		AT		BT	AT
				P	L	E	P	L	E	1/2hr	1 hr	1/2hr	1 hr		
1	2200	7,700	7,900	68	30	2	54	37	3	20	30	10	20	12.4	13
2	2451	7,800	7,900	64	33	3	66	31	3	5	12	3	6	12.4	13
3	2606	9,100	9,200	63	33	4	60	37	3	7	16	5	10	10	10.2
4	2625	9,100	9,300	69	28	3	62	34	4	7	15	4	8	10.1	11
5	2692	8,500	8,700	61	26	13	65	32	3	3	6	2	4	12	13.4
6	2725	8,200	8,900	66	31	3	60	36	4	2	5	3	7	12	12.4
7	2801	7,800	7,900	63	33	4	60	38	2	1	3	1	3	12.5	12.7
8	2960	8,100	8,500	59	38	3	66	30	4	10	22	4	12	11.8	12
9	2970	9,000	9,100	63	33	4	59	36	5	2	5	1	3	12	413.6
10	2972	9,100	9,000	61	24	15	59	36	5	7	15	5	10	12	12.6
11	3114	8,900	9,000	61	35	4	60	36	4	20	30	12	22	10.6	11
12	3199	6,900	7,000	57	41	2	60	36	4	2	5	2	4	13.5	13.7
13	3208	9,400	9,600	59	32	9	63	33	4	10	22	7	14	11.2	11.4
14	3505	8,200	8,300	58	38	6	53	34	3	3	7	2	3	11.8	12.8
15	3511	8,400	8,500	56	41	1	56	43	1	10	22	5	10	12	12.4
16	3520	7,000	7,200	62	36	2	59	38	3	18	27	9	18	11.2	11.2
17	3523	9,500	9,600	68	28	4	63	33	4	4	9	3	8	10.8	10.9
18	3605	7,900	8,000	65	32	3	62	34	4	3	7	2	5	12.8	12.8
19	3607	7,500	7,600	62	34	4	60	37	3	10	20	5	10	13	13
20	3617	10,500	10,500	72	25	3	62	36	2	6	13	4	9	10.8	11

LABORATORY INVESTIGATION - IN - PATIENTS															
Sl.No	I.P.No	TC (Cells/Cumm)		DC Cells (%)						ESR (mm)				Hb (%)	
		BT	AT	BT			AT			BT		AT		BT	AT
				P	L	E	P	L	E	1/2hr	1 hr	1/2hr	1 hr		
1	2200	7,700	7,900	68	30	2	54	37	3	20	30	10	20	12.4	13
2	2451	7,800	7,900	64	33	3	66	31	3	5	12	3	6	12.4	13
3	2606	9,100	9,200	63	33	4	60	37	3	7	16	5	10	10	10.2
4	2625	9,100	9,300	69	28	3	62	34	4	7	15	4	8	10.1	11
5	2692	8,500	8,700	61	26	13	65	32	3	3	6	2	4	12	13.4
6	2725	8,200	8,900	66	31	3	60	36	4	2	5	3	7	12	12.4
7	2801	7,800	7,900	63	33	4	60	38	2	1	3	1	3	12.5	12.7
8	2960	8,100	8,500	59	38	3	66	30	4	10	22	4	12	11.8	12
9	2970	9,000	9,100	63	33	4	59	36	5	2	5	1	3	12	413.6
10	2972	9,100	9,000	61	24	15	59	36	5	7	15	5	10	12	12.6
11	3114	8,900	9,000	61	35	4	60	36	4	20	30	12	22	10.6	11
12	3199	6,900	7,000	57	41	2	60	36	4	2	5	2	4	13.5	13.7
13	3208	9,400	9,600	59	32	9	63	33	4	10	22	7	14	11.2	11.4
14	3505	8,200	8,300	58	38	6	53	34	3	3	7	2	3	11.8	12.8
15	3511	8,400	8,500	56	41	1	56	43	1	10	22	5	10	12	12.4
16	3520	7,000	7,200	62	36	2	59	38	3	18	27	9	18	11.2	11.2
17	3523	9,500	9,600	68	28	4	63	33	4	4	9	3	8	10.8	10.9
18	3605	7,900	8,000	65	32	3	62	34	4	3	7	2	5	12.8	12.8
19	3607	7,500	7,600	62	34	4	60	37	3	10	20	5	10	13	13
20	3617	10,500	10,500	72	25	3	62	36	2	6	13	4	9	10.8	11

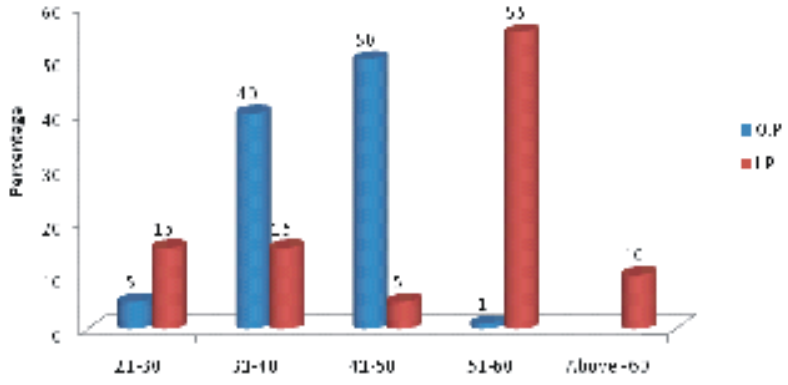
BT- Before Treatment, AT- After Treatment, TC- Total Count, DC- Differential Count, P- Polymorphs, E- Eosinophils, ESR- Erythrocyte Sedimentation Rate, Hb- Haemoglobin.

LABORATORY INVESTIGATION -(IN - PATIENTS) - II											
Sl.No	I.P.No	Blood sugar (mgs %)		Blood Urea (mgs %)		Total Cholesterol (mgs %)		Serum Bilirubin (mgs %)		Serum Creatinine (mgs %)	
		BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
1	2200	82	94	20	24	145	160	0.8	0.8	0.6	0.5
2	2451	81	95	28	30	141	157	0.8	0.8	0.5	0.5
3	2606	57	70	27	26	110	117	0.8	0.8	0.5	0.5
4	2625	130	140	27	24	120	127	0.9	0.9	0.8	0.8
5	2692	68	90	18	17	172	175	0.8	0.8	0.8	0.8
6	2725	93	100	26	22	195	198	0.7	0.7	0.5	0.5
7	2801	98	108	22	21	136	140	0.8	0.8	0.6	0.6
8	2960	100	115	30	25	180	187	0.7	0.7	0.7	0.7
9	2970	90	100	24	26	165	167	0.9	0.9	0.9	0.9
10	2972	85	90	27	26	168	172	0.7	0.7	0.7	0.7
11	3114	75	110	27	27	140	144	0.8	0.8	0.8	0.8
12	3199	90	99	18	19	105	111	0.7	0.7	0.8	0.8
13	3208	94	112	24	27	160	163	0.8	0.8	0.9	0.9
14	3505	66	75	16	20	172	177	0.8	0.8	0.7	0.7
15	3511	70	80	25	30	182	178	0.7	0.7	0.7	0.7
16	3520	95	105	37	36	129	135	0.9	0.9	1.08	1.2
17	3523	96	108	14	16	181	185	0.8	0.8	0.9	0.9
18	3605	74	80	21	20	196	195	0.8	0.8	0.8	0.8
19	3607	68	84	19	18	120	124	0.7	0.7	0.5	0.5
20	3617	86	95	28	29	210	215	0.8	0.8	0.9	0.9

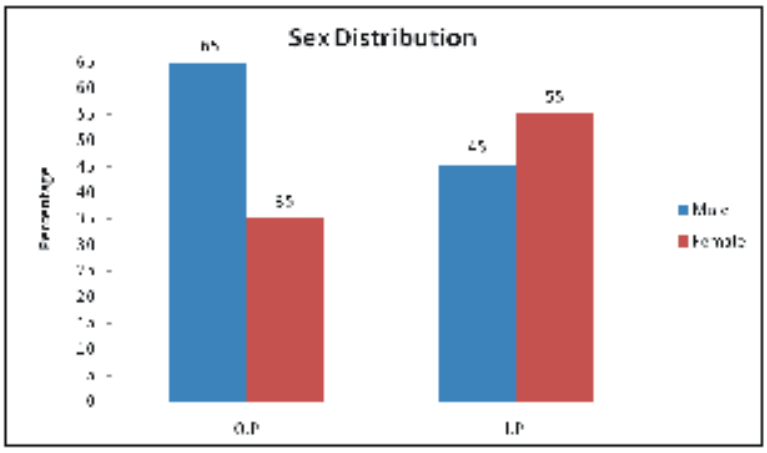
BT- Before Treatment, AT- After Treatment

LABORATORY INVESTIGATION -(IN - PATIENTS) - III													
Sl.No	I.P.No	Urine Analysis											
		Before treament						After treament					
		Albumin	Sugar	Pus Cells	Epithelial Cells	RBC	Cast / Crystals	Albumin	Sugar	Pus Cells	Epithelial Cells	RBC	Cast / Crystals
1	2200	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
2	2451	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
3	2606	Nil	Nil	I- 2	FEW	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
4	2625	Nil	Nil	I- 2	NAD	I- 2	NAD	Nil	Nil	NAD	NAD	NAD	NAD
5	2692	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
6	2725	Trace	Trace	2 - 3	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
7	2801	Nil	Nil	I- 2	I- 2	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
8	2960	Nil	Nil	I- 2	NAD	NAD	Ca. Ox	Nil	Nil	NAD	NAD	NAD	NAD
9	2970	Nil	Nil	2 - 3	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
10	2972	Nil	Nil	2 - 5	NAD	2 - 3	NAD	Nil	Nil	NAD	NAD	NAD	NAD
11	3114	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
12	3199	Nil	Nil	I- 2	FEW	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
13	3208	Nil	Nil	Few	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
14	3505	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
15	3511	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
16	3520	Nil	Nil	2 - 3	I- 2	NAD	O. Gr.Ca	Nil	Nil	NAD	NAD	NAD	NAD
17	3523	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
18	3605	Nil	Nil	I- 2	NAD	2 - 3	NAD	Nil	Nil	NAD	NAD	NAD	NAD
19	3607	Nil	Nil	Few	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD
20	3617	Nil	Nil	I- 2	NAD	NAD	NAD	Nil	Nil	NAD	NAD	NAD	NAD

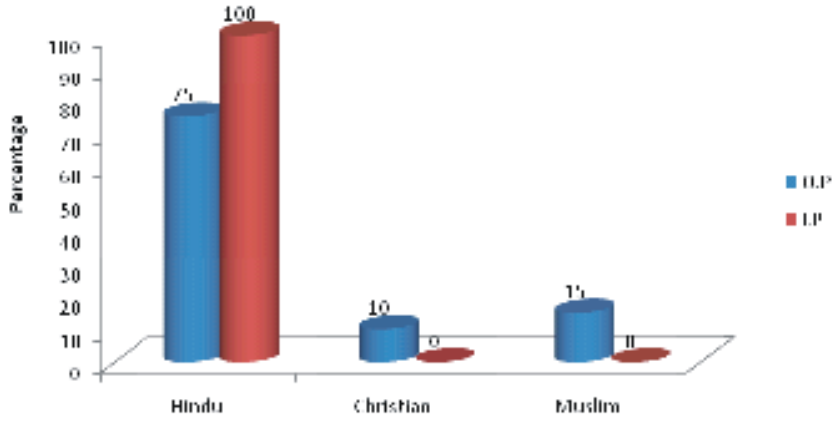
Age Distribution



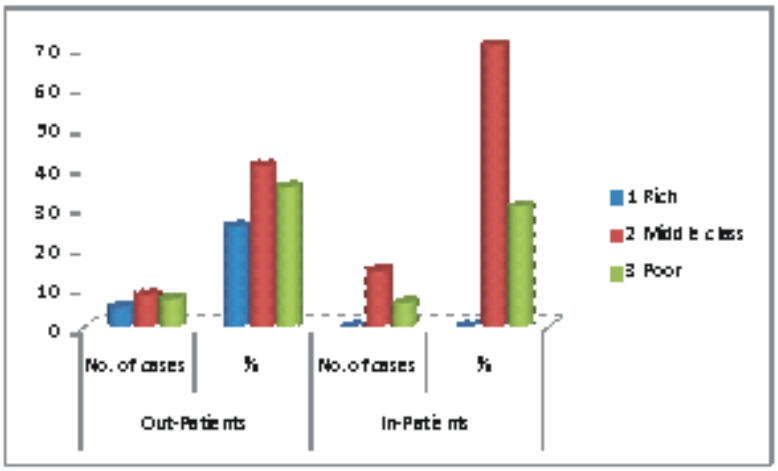
Sex Distribution



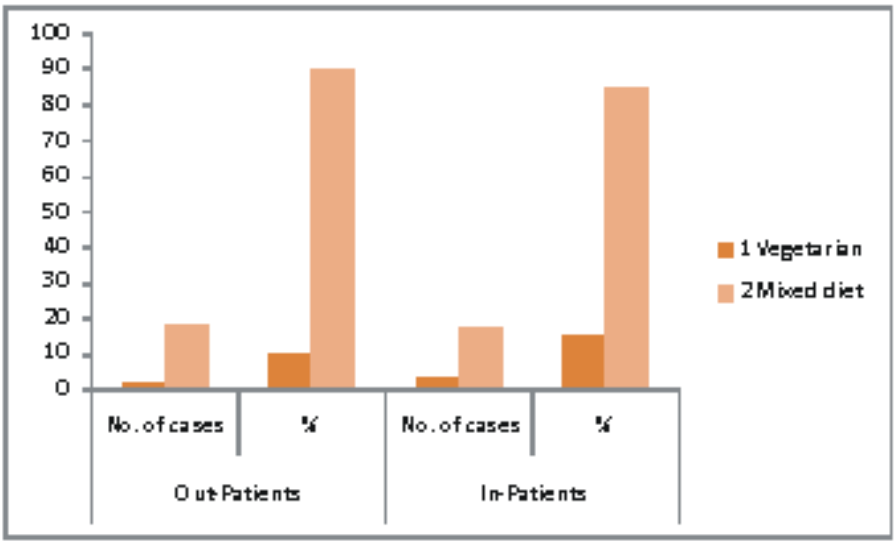
Religion



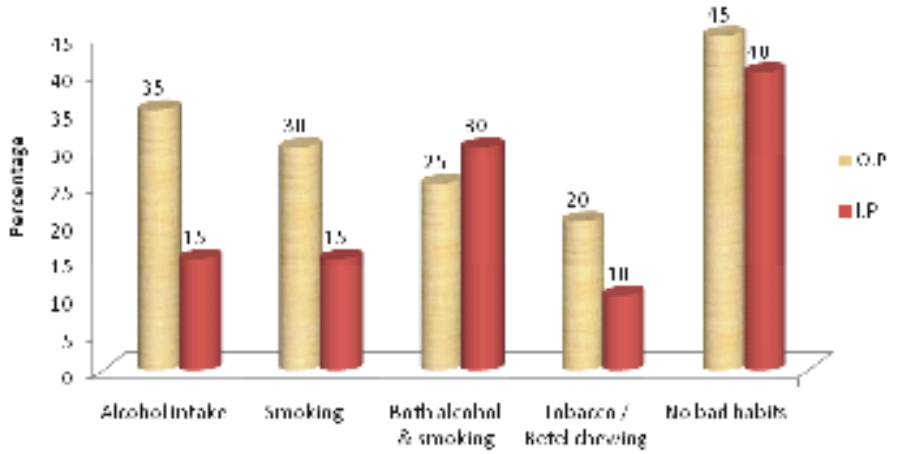
Socio-economic status



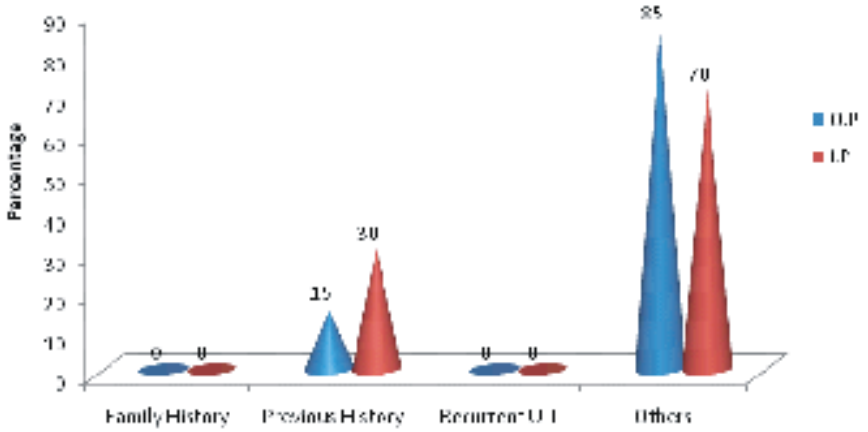
Food Habits



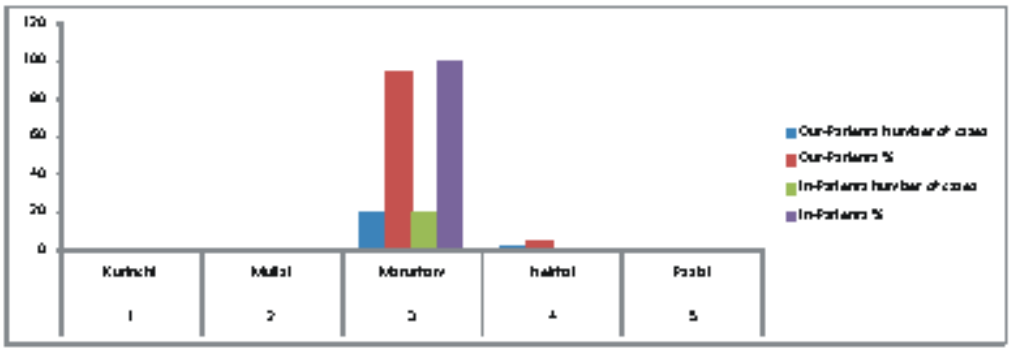
Personal Habits



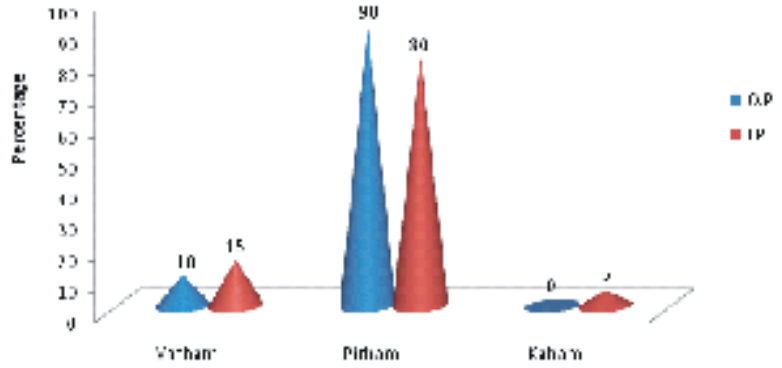
Aetiological Factors



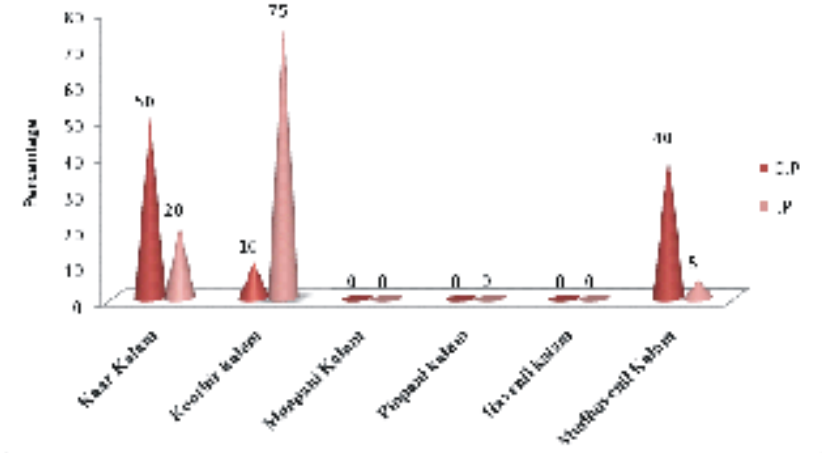
Thinai



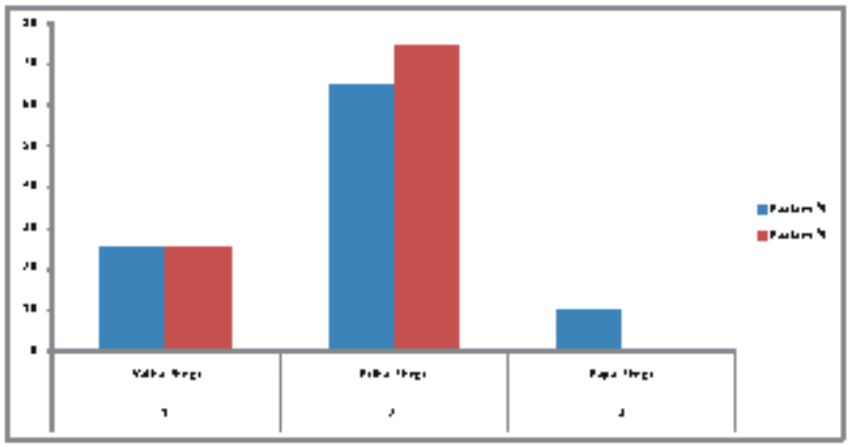
Mukkutra Kalam

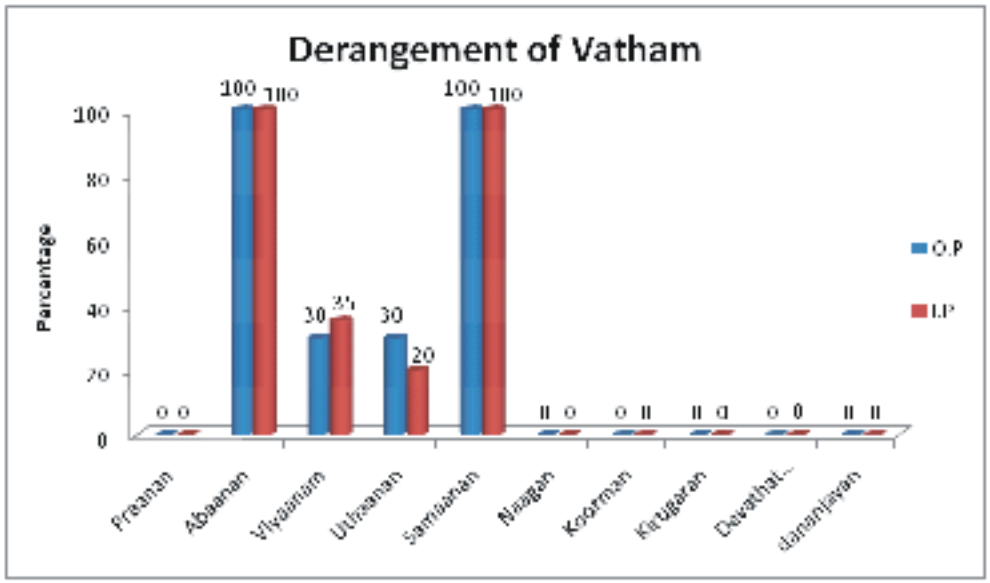


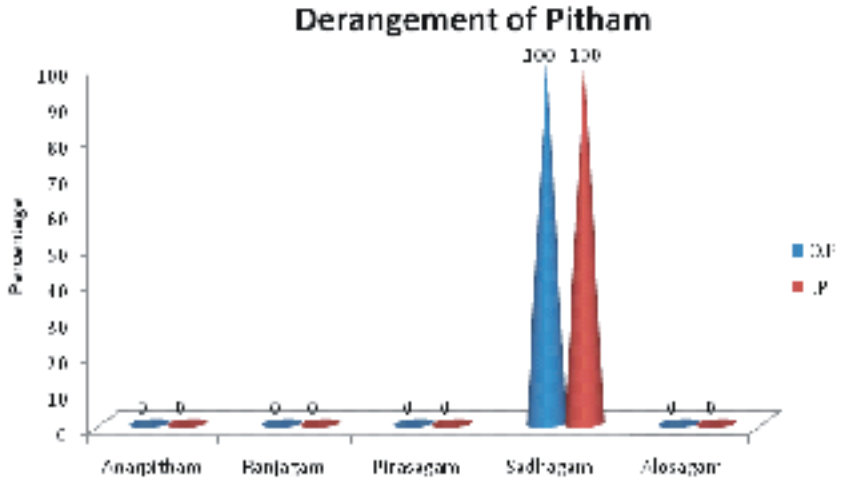
Paruvakalam

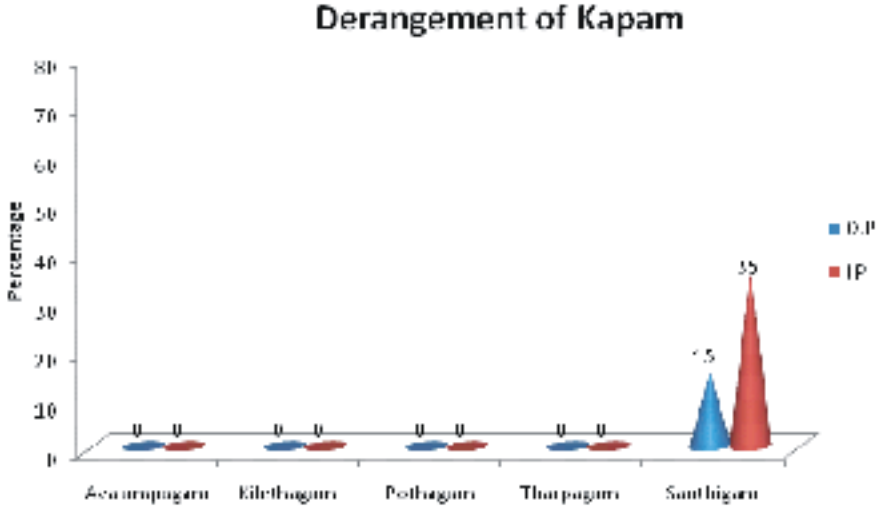


Thegi (Constitution of body)

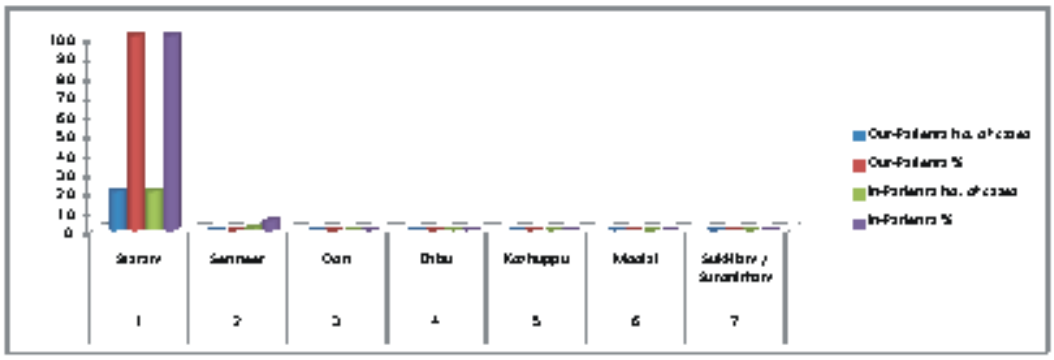



Derangement of Vatham
Percentage
100
80
60
40
20
0
100 100
30 35
30 20
100 100
0 0
0 0
0 0
0 0
Pranan
Abaanan
Viyaanan
Uthaanan
Samaanan
Naagan
Koorman
Kiruparan
Devathat...
dhanjajayan
O.P
I.P

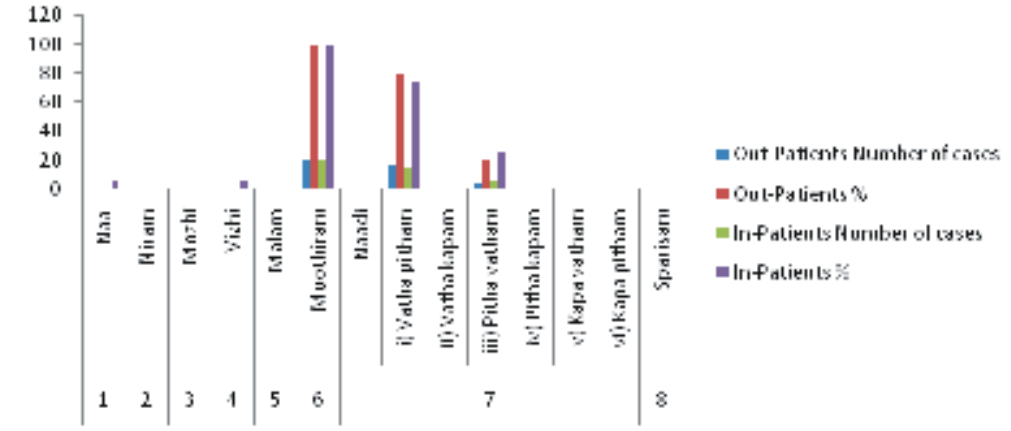

Derangement of Pitham
Percentage
100
90
80
70
60
50
40
30
20
10
0
100 100
0 0
0 0
0 0
0 0
Anaipitham
Ranjanam
Pirasagam
Sadhagam
Alasagam
O.P
I.P


Derangement of Kapam
Percentage
80
70
60
50
40
30
20
10
0
0 0
0 0
0 0
0 0
15
35
Avalampagam
Elaithagam
Pothagam
Thalpagam
Santhigam
O.P
I.P

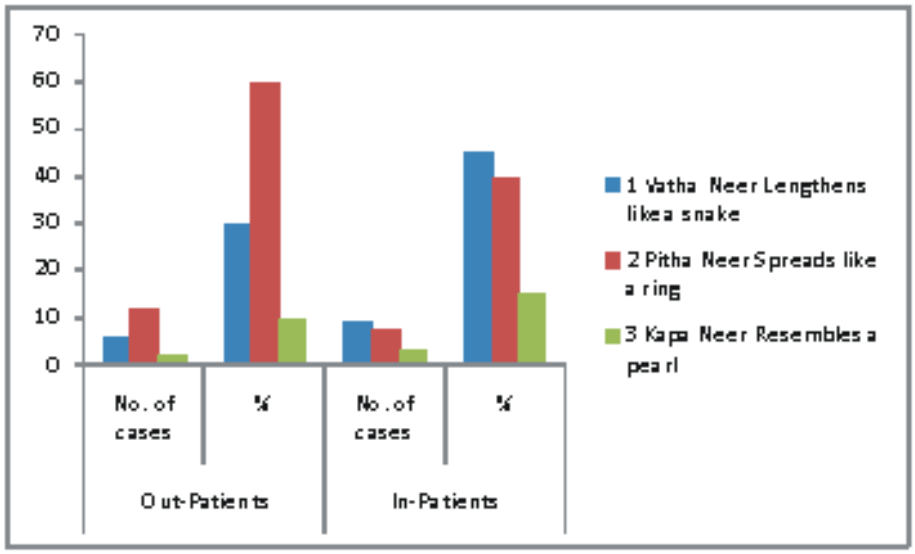
Udal Thathukkal

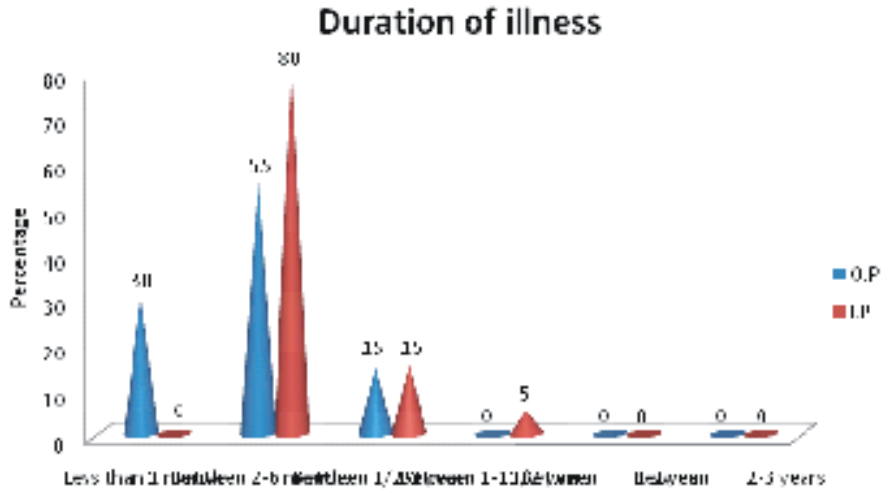


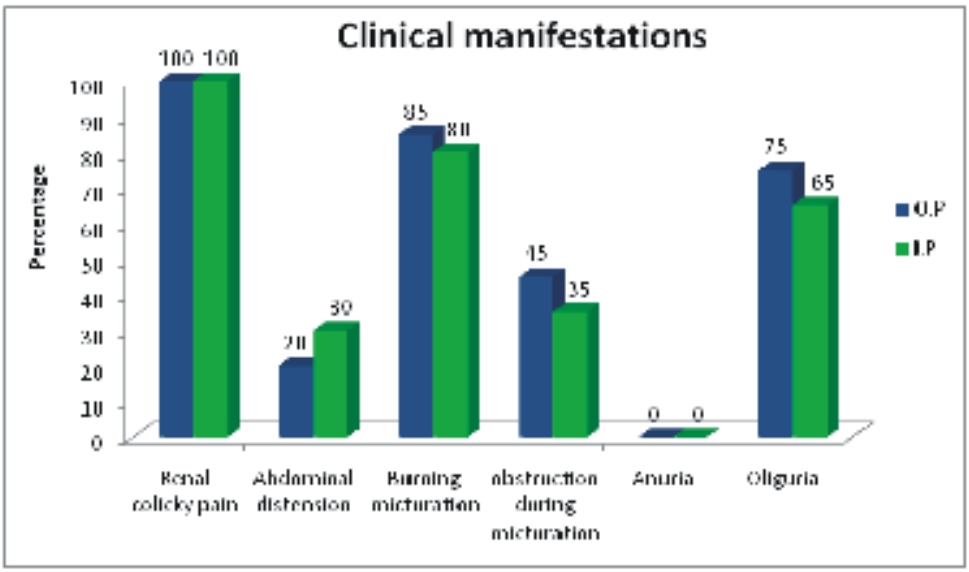
Envagai Theervugal



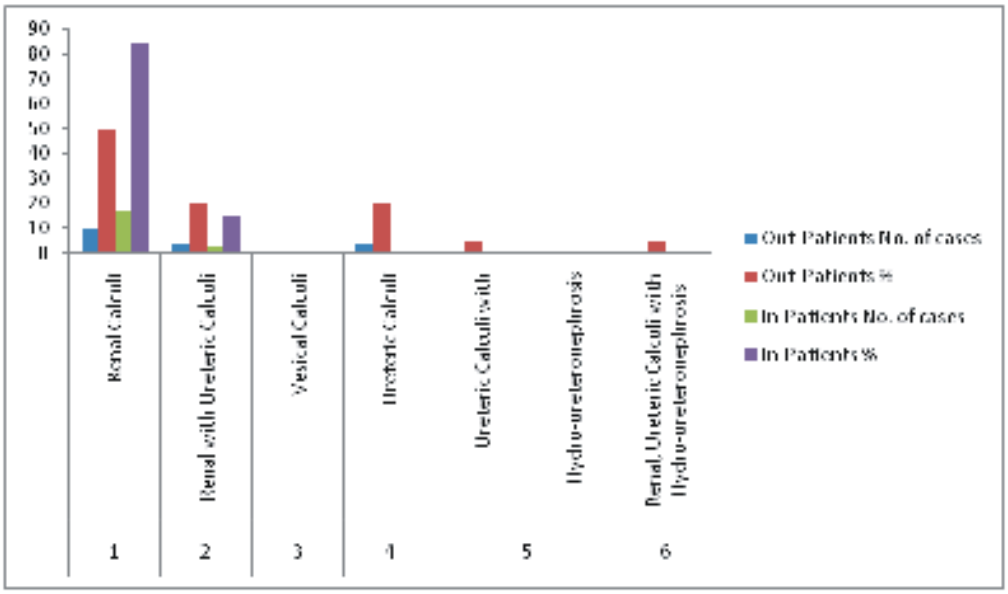
Neerkuri


70
60
50
40
30
20
10
0
No. of cases
%
No. of cases
%
Out-Patients
In-Patients
1 Vatha Neer Lengthens likea snake
2 Pitha Neer Spreads like a ring
3 Kapa Neer Resembles a pearl

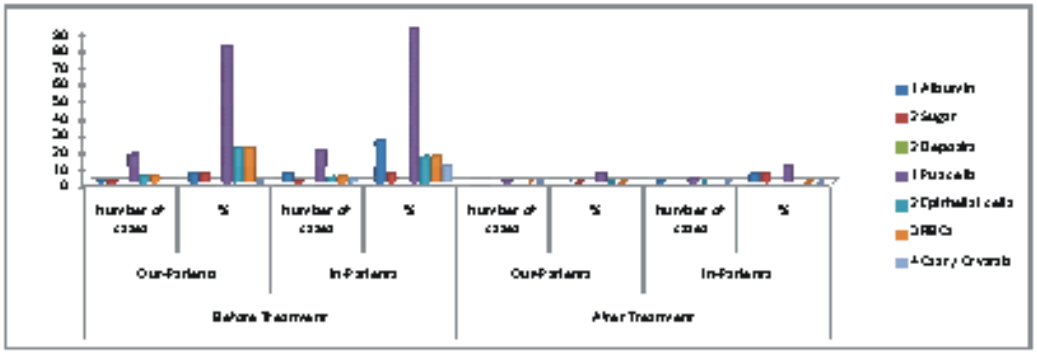

Duration of illness
Percentage
80
70
60
50
40
30
20
10
0
40
0
55
80
25
25
0
5
0
0
0
0
O.P
I.P


Clinical manifestations
Percentage
100
90
80
70
60
50
40
30
20
10
0
100
100
20
30
85
80
45
35
0
0
75
65
O.P
I.P
Renal colicky pain
Abdominal distension
Burning micturation
abstruction during micturation
Anuria
Oliguria

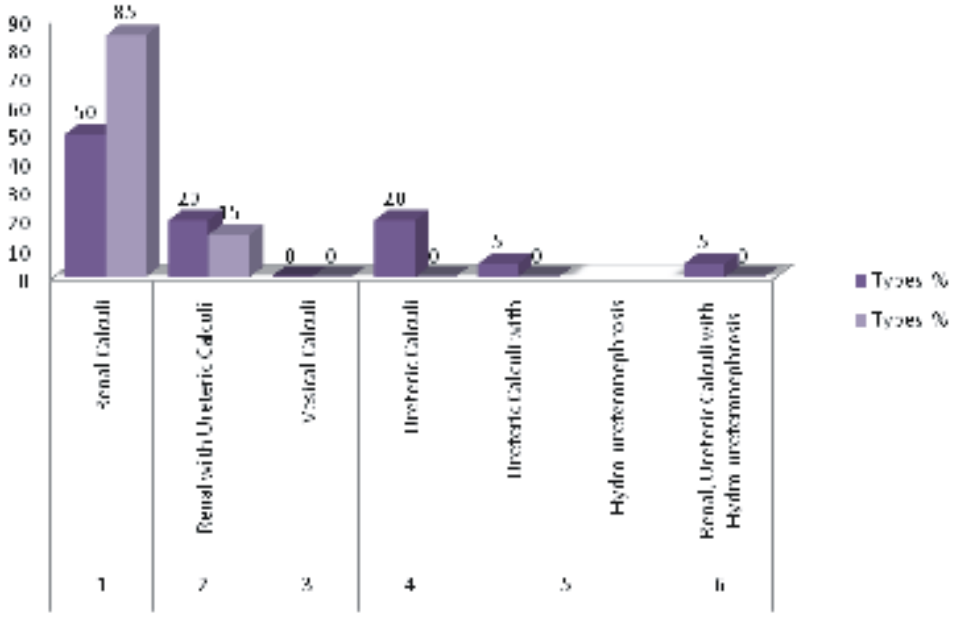
Incidence of various types of calculi

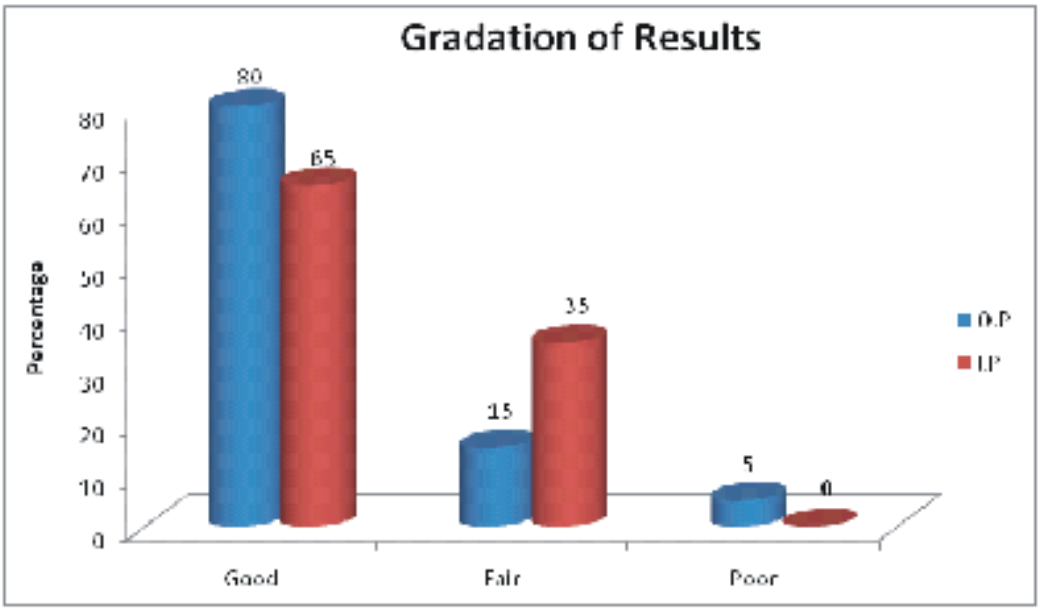


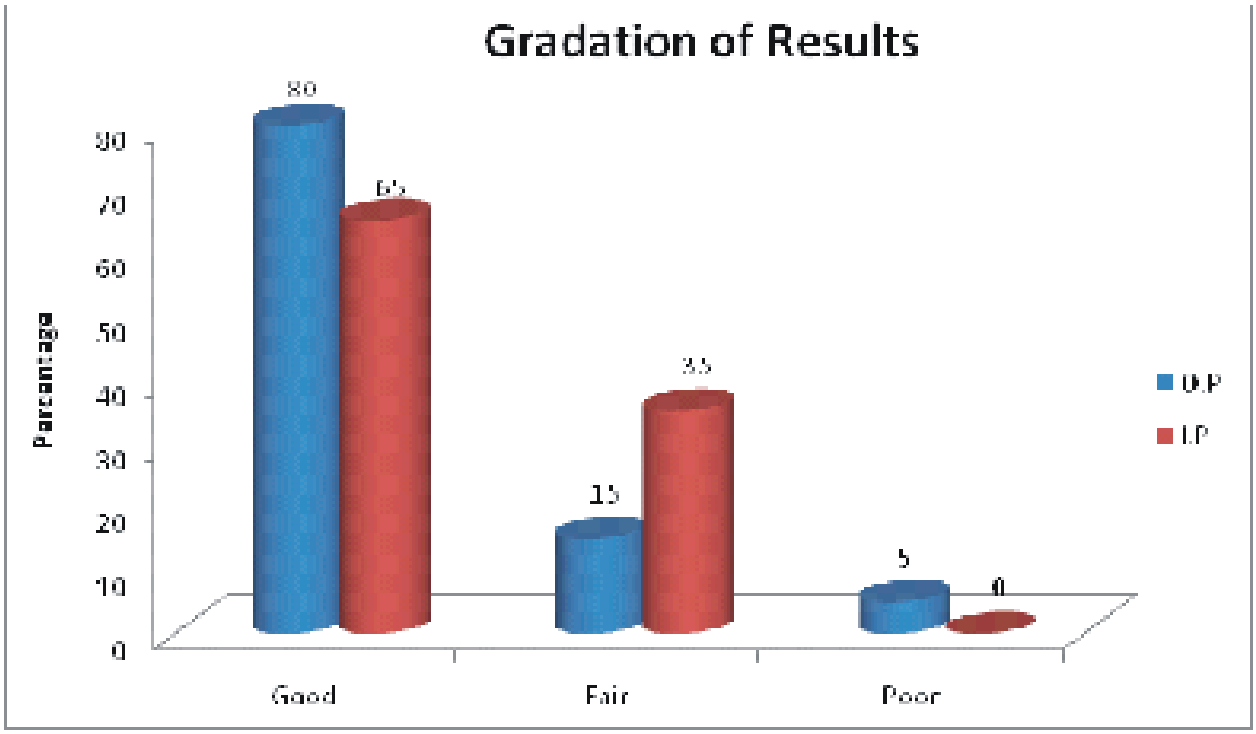
Urine analysis



Ultra-sonography report






Gradation of Results
Percentage
80
65
15
35
5
0
Good
Fair
Poor
U.P
I.P

DISCUSSION

DISCUSSION

The present study is "To evaluate the efficacy of trial medicine Aruvagaichooranam (Internal)" in the management of kalladaippu. (Urolithiasis) 20 out patients and 20 in patients were selected based on clinical features and modern investigation parameters. The eight types of siddha diagnostic methods (envagai thervu) also carried out. The disease diagnosed was confirmed by ultrasonagram. The trial medicine Aruvagai chooranam prepared and given to the patients. The reports of urine, blood and general details collected from the patients tested before and after treatment were analysed to asses the thearapeutic value of the trail drug Aruvagai chooranam.

Age

In this study, among the 20 out-patients, Kalladaippu noi was found to be the most common in the age group, 41-50 years. But in case of in-patients, it was predominant (55%) in the age group, of 51-60 years.

Sex

It was learnt from the present study that out of 20 OP, occurrence of Kalladaippu noi was found to be higher in males (65%) than females (35%). In IP, 55% were females and 45% were males.

Religion

It was learnt that majority of the patients were Hindus (75%) of OP and in IP all the patients belongs to hindus. There were few christians (10%) and muslims (15%).

Occupation

The present study revealed that majority of the OP (40%) were holding private jobs and IP (50%) were home makers. The rest consisted of coolie (10% of OP and 20% of IP), driver (10% of OP and 5% of IP), and government employees (15% of OP). Only 5% of OP were farmers and 10% IP were holding private jobs.

Socio-economic status

Most of the patients (40% of OP and 70% of IP) were hailing from the middle class families. This was followed by patients from the poor families (35% of OP and 30% of IP) and rich families (25% OP and 0% IP).

Food Habits

Majority of the patients (90% of OP and 85% of IP) were found to take mixed food, containing both vegetarian and non-vegetarian items. only 10% of OP and 15% of IP were pure vegetarians.

Personal Habits

In this study, 45% of OP and 40% of IP were found to have no bad habits. 35% of OP and 15% of IP were alcoholics, 30% of OP and 15% of IP were smokers. 25% of OP and 30% of OP were found to drink alcohol and do smoking. The rest, 20% of OP and 40% of IP had tobacco / betel chewing habits.

Aetiological factors

It was learnt that 15% of OP and 30% of IP had previous history of Kalladaippu noi. In the rest of the patients (85% of OP and 70% of IP), Kalladaippu noi might be attributed to altered food habits, inadequate water intake, drinking contaminated water / hard water, suppressing seminal discharge etc.,

Thinai

In this study, it was learnt that majority of the out-patients (95%) and all the in-patients were from marutha Nilam. Though, siddha literatures have mentioned that Marutham is a disease free zone, nowadays all types of diseases are found to occur in Marutham due to industrialization, urbanization, high human settlement, pollution, altered food habits etc. The rest of the patients (5%) were from Neithal Nilam.

Mukkutra Kaalam

From the present study, it was learnt that most of the out-patients (90%) and in-patients (80%) fell under Pitha Kaalam (34-66 years). It was followed by Vatha Kaalam (10%) for OP and (15%) for IP. It was the least for Kapa Kaalam (0%) in for OP and (5%) for IP.

Paruvakaalam

In general, Kalladaippu noi occurs in all the seasons. But in this study, it was found to be the commonest during kar kalam (50% of OP) and kuthir kalam in IP (75%). During mudhuvenil kalam It was 40% OP and 5% of IP. It was 10% OP in Kuthir kalam and 20% of IP in karkalam.

Thegi (Constitution of body)

In this study, Pitha thegi patients were found to be the most affected by Kalladippu noi (65% of OP and 75% of IP). This was followed by vaddegi 25% of OP and 25% of IP. Kapa thegi patients were found to be the least affected (only 10% of OP).

Mukkutram

A. Derangement of Vatham

In the present study, it was noted that all the patients under treatment had disturbances in Abaanan and Samaanan, which led to oliguria, dysuria,

formation of calculi and constipation. Viyaanan was found to be affected in 30% of OP and 35% of IP which caused severe loin / groin pain and arthritis in most of the middle aged and elderly patients. Disturbances in Uthaanan resulted in nausea / vomiting in 30% of OP and 20% IP.

B. Derangement of Pitham

Sadhagam was observed to be affected in all OP and IP due to dysuria, oliguria and difficulty in their regular work in day to day life.

C. Derangement of Kapam

Santhigam was found to be affected in 15% of OP and 35% of IP, causing joint pain in elder patients.

Udal Thathukkal

Among the seven udal thathukkal, Saaram was observed to be affected in all the patients that might have produced symptoms like lethargy and depression.

Envagai Theervugal

In this study, Moothiram was affected in all the patients. Vatha pitha naadi was felt in most of the patients (90% of OP and 75% of IP). This was followed by Pitha vatha naadi in 20% of OP and 25% of IP.

Neerkuri

The colour of the urine was observed to be yellowish in 80% of OP and 70% IP. Colour was observed to be normal in 20% of OP and 30% of IP.

Tamarind smell was felt in 65% of OP and 50% of IP. Foul smell was present in 10% of OP and 10% of IP which might be due to the presence of plenty of pus cells in their urine. Manam was sensed to be normal in 25% of OP and 40% of IP.

Nurai and edai were found to be normal in all the patients. Enjal was observed to be decreased in most of the OP 70% and IP 65% Increased enjal was noted in only 5% of OP and 10% of IP. It was found to be normal in 25% of OP and 25% of IP.

Neikuri

The study made on Neikuri of the patients showed that in majority of OP (60%) and IP (50%), Pitha neer was observed to spread like a ring. This was followed by Vatha neer lengthening like a snake in 30% of OP and 35% of IP. The Kapa neer resembled a pearl only in 10% of OP and 15% IP.

Duration of illness

Majority of the patients experienced symptoms of Kalladaippu noi only in the past 2-6 months period (55% of OP and 80% of IP) and 30% of OP developed symptoms in the last one month period.

Clinical manifestations

All the patients were observed to experience renal colicky pain (both OP and IP). Next to this, all the patients of OP and 90% IP experienced pyuria, followed by oliguria (75% of OP and 65% IP), burning micturation (85% of OP and 80% of IP), concentric urination (60% of OP and 65% of IP), obstruction during micturation (45% of OP and 35% of IP). Only few patients experienced symptoms like haematuria, nausea, vomiting and sweating.

Incidence of various types of calculi

Ultrasonograph of the patients before the treatment revealed that the majority of the patients (50% of OP and 65% of IP) suffered from presence of renal calculi. This was followed by ureteric calculi (20% of OP and 15% IP), renal with ureteric calculi (20% of OP and 20% of IP), ureteric calculi with hydro-ureteronephrosis (5% of OP) renal and ureteric calculi with hydro-ureteronephrosis (5% of OP and 0% IP). No vesical calculi was observed to be found in OP, and IP.

Urine analysis

The laboratory investigations done before treatment revealed that 80% of OP and 90% of IP had pus cells in their urine. A few had epithelial cells (20% of OP and 15% of IP). RBCs were found in the urine 20% of OP 15% of IP and cast / crystals in 5% of IP only. After the treatment, most of the patients were found to have no pus cells and epithelial cells in their urine.

Ultra-sonography report

Ultra-sonographic investigations conducted after the treatment revealed that, majority of the patients (80% of OP and 80% IP) had no calculus and were free from symptoms of Kalladaippu noi.

Stone analysis

Three stones were received from 3 different patients at the end of the treatment. Three stones were analysed in a wellreputed laboratory to know the composition of stones. The analysis of the stones indicated the presence of calcium oxalate and urate. The stone analysis reports of all the three patients are enclosed as Annexure V.

Precipitating factors

In the present study, the personal history of patients and laboratory investigations revealed that the occurrence of Kalladaippu noi might be

attributed to altered food habits , drinking contaminated water / hard water, inadequate water intake, suppressing seminnal discharge, and poor health awareness.

Treatment

The trail medicine selected for the clinical study was Aruvagai chooranam 2 gm BD morning & Evening with hot water afer food.

All the patients were advised to follow pathiyam and drink plenty of purified water. In addition, they were advised to avoid tomato, cauliflower, cabbage, dairy products etc.

The present study proved the therapeutic values of the trial medicine which is evident from the absence of calculi and symptoms associated with kalladaippu noi in majority of the patients. Good response was noticed in 80% of OP and 80% of IP and moderate response in 15% of OP and 20 IP. Poor response was observed in only one out patient (5%) only. This is because the calcules could not cross the vesico ureteric junction due to the anatomical narrowing of the consistriction of the ureter. The good and moderate response of trial medicine in treating Kalladaippu noi are attributed to the lithotriptic action diuretic effect, anti-spasmodic effect, antibacterial, cooling, and demulcent effect of the trial medicine.

SUMMARY

SUMMARY

A clinical study on Kalladaippu noi with the following trial medicine was undertaken for my dissertation work at the Post Graduate Department of Pothu Maruthuvam, Government Siddha Medical College and Hospital, Palayamkottai.

i. Aruvaghai Chrooranam 2gm BD morning & Evening with hot water after food (internal).

The study was undertaken

1. To find out the efficacy of the trial medicine in dissolving or breaking the calculi into fragments.
2. To know the efficiency of the medicine in spontaneous expulsion of the calculi.
3. To know about the recurrence (or) any adverse effects in the patients during the course of treatment with the trial medicine.

The patients showed good prognosis within a short period. Ureteric colic and burning micturation reduced within one week of treatment. It was observed that all other signs and symptoms relieved at the end of course of the treatment with the trial medicine and strict diet restriction (pathiyam).

From the clinical examination and enquiring the patients, it was noted that stones got broken and fragmented and passed out in the form of sand grains with urine. It was evident from the laboratory and ultra-sonographic investigations that the trial medicines helped in the spontaneous expulsion of calculi in some of the patients. Good response was noticed is in 80% of OP and 80% of IP and moderate response in 15% of OP and 20% of IP. Poor response was in only one in-patient (only 5% of OP).

The patients were advised to take the trial medicine, Aruvagai Chooranam after food. As the ingredients incorporated in the trial medicine have cooling, lithotriptic action, demulcent diuretic and antispasmodic effect, they should have compensated the deranged pitham in Kalladaippu and initiated diuretic action to expel the stone. The patients were advised to restrict diet to avoid recurrence.

The pharmacological study revealed that the trial medicine had lithotriptic, diuretic and anti-spasmodic effects. The literatures have not reported any toxic effects of the ingredients incorporated in the trial medicine. Accordingly, the patients under treatment also had not experienced adverse effects during the course of treatment with the trial medicine. From this study, it has been proved that the trial medicine, **Aruvagai Chooranam (Internal)** are highly effective and economicaly viable in curing Kalladaippu noi.

CONCLUSION

CONCLUSION

The following conclusions have been drawn from the clinical study on "The evaluation of efficacies of the trial medicine namely, **Aruvagai Chooranam (internal)** in treating **Kalladaippu noi**", undertaken at the PG Department of Pothu Maruthuvam, Government Siddha Medical College and Hospital, Palayamkottai as my dissertation work.

1. The pharmacological study on trial medicine revealed the lithotriptic, diuretic and anti-spasmodic effect of the trial medicine - **Annexure I**.

2. The biochemical analysis of trial medicine revealed the presence of various minerals like Calcium, Chloride, and Ferrous Iron - **Annexure II**.

3. The microbiological analysis reveald the antibacterial activity of trial medicine. **Annexure III**

4. The ingredients incorporated in the trial medicine helped to cure Kalladaippu noi by compensating the increased pitham which is attributed to the diuretic, lithotriptic action, anti-spasmodic effect, cooling and demulcent effect as mentioned in the various siddha literatures - **Annexure IV**.

4. The analysis of the stones of some the patients revealed the presence of calcium oxalate and urate - **Annexure V**.

5. Clinically, the trial medicine are free from side effects as no patient experienced side effects during the course of treatment.

6. The result showed good response in 85% of OP and 80% of IP and fair response in 15% of OP and 20% of IP. Poor response was observed in only one patient (5% of OP only) due to the antomical narrowing of the vesico ureteric junction presence of large sized calculus.

The trial medicine were found to have lithotriptic, diuretic anti-spasmodic effect, antibacterial activity and have properties to compensate the increased pitham, which is one of the important causes for Kalladaippu. From this study, it has been proved that the trial medicine, **Aruvagai Chooranam** are **highly effective and economicaly viable in curing Kalladaippu noi.**

ANNEXURES

PREPARATION OF THE TRIAL DRUG

அறுவகை சூரணம்

PREPARATION OF TRIAL MEDICINE

ARUVAGAI CHOORANAM (Internal)

The “ Aruvagai Chooranam” was prepared in accordance with the following reference.

சகல நோய்கட்கும் அறுவகைச் சூரணம்

தீவரவே சகலநோய்கட்கும் சொல்லக் கேளு
சீரகத்தோ டதிமதுரம் நாகப் பூவும்
தாரமங் கருஞ்சீரகம் வலங்கப் பூவுஞ்
சதகுப்பை வகைவகைக்குப் பலந்தா னொன்று
கூரவே சர்காறும் ஆறுபலஞ் சொன்னோம்
கொத்தமல்லி பலமாறு சமனாய் கூட்டி
சேருமே வகையென்ன பன்னி ரண்டாச்சு
சீனிகற்கண்டு பலம்பனி ரெண்டாமே.
பன்னிரெண்டும் வெல்வெறே இடித்து ஒன்றாய்
பாங்கான காசியென்ற மேருவிலே அடைத்து
உன்னியே வெறுகடித்தூள் அந்திசந்தி கொள்ளு
ஒரு நேரம் வென்னீர்கொள் ளுண்மை யாகக்
குன்னாது சரீரதிடம் குலையெரிவு குன்மம்
கொடிதான் நெஞ்சுவலி அரோசிகமும் போகும்
உன்னியே சிரசில்நோ வெல்லாந் தீரும்
ஓடுமே பித்தமொடு பிரட்டல் நீரூரல்

கண்ணில்நீர் பாய்ச்சலறும் பிரகாச மாகும்

கலங்காது புத்தியது மந்தந் தீரும்

தீருமே நித்திரையும் சுகமுண் டாகும்

தீராத புழுக்கிருமி சோகை போகும்

வாருமே இடுப்புவலி **கல்லடைப்பு** வலிப்பு

வாய்கோணல் வாய்குளறல் வாத பித்தம்

தீருமே செவிநோயுஞ் செவிடு ஊமை

சேத்துமமும் பில்லியொடு வஞ்சனையுந் தீரும்

சாரிடுமே தொண்டைப்புண் கண்ட மாலை

சரீரத்தில் நீர்கட்டு சார்ந்து போமே.

பிரம்மமுனி லைத்திய சூத்திரம் – 390 , பாகம் – 1, பக்கம் – 120

i) Ingredients

The following raw drugs required for the preparation of trial medicine, Aruvagai Chooranam were purchased.

Sl. No.	Name of the drugs	Chemical / Botanical Name	Parts used	Quantity (gm)
1.	Seeragam	Cuminum Cyminum	Purified Seeds	105
2.	Athimathuram	Glycyrrhiza glabra	Purified Root	105
3.	Sirunaga Poo	meusua ferra	Purified Dried flowers	105
4.	Karunseeragam	nigella sativa	Purified Seeds	105
5.	Elavanga Poo	syzygium aromaticum	Purified Dried flowers	105
6.	Sathakuppai	Anethum graveolens	Purified Dried Fruits	105
7.	Kotthamalli	coriandrum sativum	Purified Seeds	630
8.	Whitesugarcandy	Saccharum Officinarum	Juice	1260

ii) Purification of Drugs

Athimathuram :

Remove the bark, take the central portion of the root , cut into small pieces and dried in sunlight.

Drugs other than Athimathuramver are cleaned fried slightly and taken.

PROCESS OF PREPARATION

All the purified and processed drugs are finely powdered seperately and mixed with white sugar candy.

Reference :Gunapadam Thathu jeeva vaguppu

Dosage: 2 gm with water BD morning and evening

Duration:

30 days

Drug storage

The trial drug Aruvagai chooranam is stored in clean and airtight narrow mouthed Bottles.

Dispensing

For out patients, the chooranam is given in 2 gm packets and totally four packets are given for two days.

அறுவகைச் சூரணம் சேரும் மருந்துகள்

சீரகம்

வாந்தி யருசிகுன்மம் வாய்நோய்பி லீகமிரைப்
பேற்திருமல **கல்லடைப்பி** லாஞ்சனமும் – சேர்ந்தகம்மல்
ஆசனகு டாரியெனும் அந்தக் கிரகணியும்
பாசனகு டாரியுண்ணப் போம்.

குணபாடம் 1ம் பாகம்,மூலிகை உகுப்பு, பக்.369

அதிமதுரம்

அதிமதுரம் பேரீந்துக் கானகுணங் கேளீர்
கொதிமருவாப் பித்தங் குறுகுமே–துதிமருவாய்
நீரதுவு முண்டாம் நிலையாத தாபம்போம்
பாரறியச் சொன்னோம் பகர்ந்து.

குணபாடம் 1ம் பாகம்,மூலிகை உகுப்பு, பக்.10

சிறுநாகப்பூ

சிறுநாகப் பூவினது செய்கைதனைச் சொல்வோம்
குறியாகும் மேகத்தைக் கொல்லும்–நெறிவிட்டுத்
தீதாய்ச் செல்வாயுவையுந் தீர்க்குமிரு மற்போக்கும்
கோதாய்! இதையறிந்து கொள்.

குணபாடம் 1ம் பாகம்,மூலிகை உகுப்பு, பக்.357

கருஞ்சீரகம்

கருஞ்சீ ரகத்தான கரப்பனொடு புண்ணும்
வருஞ்சிராய்ப் பீநசமு மாற்றும் – அருந்தினால்
காய்ச்சல் தலைவலியுங் கண்வலியும் போமுலகில்
வாய்ச்ச மருந்தெனவே வை.

குணபாடம் 1ம் பாகம்,மூலிகை உகுப்பு, பக்.372

இலவங்கப்பூ

சுக்கிலநட் டங்கர்ண சூர்வியங்க லாஞ்சனந்தாட்
சிக்கல்விடாச் சர்வா சியப்பிணியு–மக்கிக்குட்
டங்கப் பூவோடு தரிபடருந் தோன்றிலில்
வங்கப்பூ வோடுரைத்து வா.

குணபாடம் 1ம் பாகம்,மூலிகை உகுப்பு, பக்.86

சதகுப்பை

வாதமொடு கூதிகா வாதம் சிரசுநோய்
மோதுசெவி நோய்கபநோய் மூடுசுரம்–ஓதுகின்ற
மூலக் கடுப்பு முதிர்பீநசம் போகும்
ஞாலச் சதகுப்பை நாடு.

குணபாடம் 1ம் பாகம்,மூலிகை உகுப்பு, பக்.340

கொத்தமல்லி

கொத்துமல்லி வெப்பம் குளிர்காய்ச்சல் பித்தமந்தஞ்
சர்த்திவிக்கல் தாகமொடு தாதுநட்டம்–கத்தியெழும்
வாத விகார்மடர் வன்கர்த்த பிவிரணம்
பூதலத்தில் லாதகற்றும் போற்று.

குணபாடம் 1ம் பாகம்,மூலிகை உகுப்பு, பக்.315

சீனாகற்கண்டு

ஈறின் தடிப்பு மிருமலும்பல் வாந்திகளுஞ்
சீறுகப மூட்டினமுஞ் சேராதே – தேறியநற்
சொற்கண் டிளங்குயில்கள் சூழ மடவனமே!
கற்கண் டெனவுரைக்குங் கால்.

குணபாடம் 1ம் பாகம்,மூலிகை உகுப்பு, பக்.189

S.No	Botanical Name	characters	Chemical Constituents	Action
1.	*Cuminum cyminum* (Apiaceae)	சுவை – கார்ப்பு, இனிப்பு குன்மை – குட்பம் பிரிவு – இனிப்பு	Cuminic, cymene, dipentene, limonene, phellandrene, pinene, cuminol	Carminative, Stimulant, **Stomachic**, Astringent, antiseptic,
2.	*Glycyrrhiza glabra* (Fabaceae)	சுவை – இனிப்பு குன்மை – சீதம் பிரிவு – இனிப்பு	Glycyrrhizin, Liquorice, Liquiritigenin, Liquiritin (Flavanones), Isoliquiritigenin, Isoliquiritin (Chalcones), Genistein, Glicoricone, Glisoflavone, Isoangustone A (Isoflavones), Glycyrrhizoflavanone, Glysperin F, Licoiso flavanone (Isoflavanones), Glyasperin C, Glyasperin D, Glabridin, Licoricidin (Isoflavans), Glycocomumarins, Lipocoumarins, Glycyrin (3-Arylcoumarins), Licocoumarone, Licoriphenone, Isoglycryol	**Emollient**, **Demulcent**, Mild expectorant, **Laxative**, Tonic
3.	*Mesua Ferra* (Clusiaceae)	சுவை – சிறுகைப்பு, துவர்ப்பு குன்மை – குட்பம் பிரிவு – கார்ப்பு	Volatile Oil	Carminative, Astringent,

4.	*Nigella Sativa* (Fanunculaceae)	சுவை – கைப்பு தன்மை – வெட்பம் பிரிவு – கார்ப்பு	Melathin, Meterbinglucosides, Saporin	Carminative, **Diuretic**, Emmenagogue, Galactogogue Anthelmntic, **Stomachic**, Parasiticide, Emolient
5.	*Syzygium aromaticum* (*Eugenia caryophyllata*) *Euphorbiaceae*	சுவை – காரம், விரல்விரைப்பு தன்மை – வெப்பம் பிரிவு கார்ப்பு	Phenylpropanoids (Carvacrol, Thymol, Eugenol, Cinnamaldehyde, Eugenin, Caryophylene), Flavaroids, Carbohydrates, Lipids, Oleanolic Acid, Rhamnetin, Vitamins	**Antispasmodic**, Carminative, **Stomachic**, Anticarcinogenic
6.	Anethum Graveolens (Umbelliferae)	சுவை – இனிப்பு, கார்ப்பு தன்மை – வெப்பம் பிரிவு – கார்ப்பு	Anethine, Phellandrene, Apiol, Volatile Oil	Carminative, Deobstruent, **Diuretic**, Emmenagogue, Stimulant, **Stomachic**.
7.	Coriandrum Sativum (Umbelliferae)	சுவை – கார்ப்பு தன்மை – சீதவெப்பம் பிரிவு – கார்ப்பு	Coriandrol (terpinoid) tannin, Volatile Oil, fatty acids.	**Stomachic**, Carminative, Stimulant, **Diuretic**.
8.	*Saccharum officinarum* *Poaceae* (Eombacaceae)	சுவை இனிப்பு தன்மை – சீதம் பிரிவு – இனிப்பு	Sugar, calcium alkaloid, albumin	**Demulcent**, Antiseptic, **Cooling**, Laxative, **Diuretic**, Nutrient

சீரகம்

அதிமதுரம்

சிறுநாகப்பூ

கருஞ்சீரகம்

கிராம்பு

சதகுப்பை

கொத்தமல்லி

சீனிகற்கண்டு

STANDARD OPERATING PROCEDURES FOR THE PREPARATION OF ARUVAGAI CHOORANAM

SOURCE OF TRIAL MEDICINE

The required raw drugs for preparations of ARUVAGAI CHOORANAM are purchased from well reputed country shop and raw drugs are identified are authenticated by Pharamacognsy expert of Govt Siddha Medical College, Palayamkottai. Then drugs are purified and medicine is prepared in P.G.Gunapadam practical hall of Govt Siddha medical college Palayamkottai.

TREATMENT:

INTERNAL MEDICINE

ARUVAGAI CHOORANAM

A) INCREDIENTS

1) SEERAGAM-105gm

Seeds of cuminum cyminum

2) ATHIMADURAM

Roots of glycyrrhizae glabra

3) SIRUNAGAPOO

Dried flowers of meusua ferra

4) KARUNSEERAGAM

Seeds of nigella sativa

5) ELAVANGAPOO

Dried flowers of syzygium aromaticum

6) SATHAKUPPAI

Dried fruits Anethum graveolens

7) KOTTHAMALLI

Dried fruits of coriandrum sativum

8) CHEENA KARKANDU

White sugar candy

Athimathuram

Remove the bark, take the central portion of the root , cut into small pieces and dried in sunlight.

Drugs other than Athimathuramver are cleaned fried slightly and taken.

PROCESS OF PREPARATION

All the purified and processed drugs are finely powdered seperately and mixed with white sugar candy.

Reference :Gunapadam Thathu jeeva vaguppu

Dosage: 2 gm with water BD morning and evening

Duration:

30 days

Drug storage

The trial drug Aruvagai chooranam is stored in clean and airtight narrow mouthed Bottles.

Dispensing

For out patients, the chooranam is given in 2 gm packets and totally four packets are given for two days.

PHARMACOLOGICAL ANALYSIS

EVALUATION OF ANTILITHIATIC ACTIVITY OF ARUVAGAI CHOORANAM IN EXPERMENTAL ANIMALS: AN IN VIVO STUDY.

Introduction

Renal lithiasis defined as the consequence of an alteration of the normal crystallization condictions of urine in the urinary tract.[1] Urine composition factors are important in crystal formation as urine is a metastable liquid containing several coexisting substance that can crystallize to generate renal calculi. These substances are present at super saturation levels. The ease of crystallization depends on the degree of super saturation, the presence of performed particles (heterogeneous nucleants that act as promoter substances) and the level of crystallization inhibitors (inhibits crystal nucleation and growth)[2]. Some of the substances found in the urine are able to crystallize and in a concentrated form these chemicals can precipitate into a solid deposit attach to the kidney walls. These crystals can grow through a process of accretion to form a kidney stone.[3] Nephrolithiasis has afflicted mankind since antiquity and can persist, with serious medical consequences, throughout patient's life time, with a recurrence rate of 70-80% in males and 47-60%in females. The present day medical management of nephrolithiasis is either costly or not without side effects. Hence the search for antilithiatic drugs from natural sources has assumed greater importance. Many Indian plants have been quoted to be useful as anti lithiatic agents . They are effective with fewer side effects and are also inexpensive. In the present study, an effort has been made to establish the scientific validity for the anti urolithiatic property of Aruvagai chooranam using ethylene glycol induced hyperoxaluria model in rats.

Materials and methods:

Preparation of the chooranam

Here add method of preparation of chooranam

Pharmacological screening of antilithiatic activity

Animals

Male albino wister rats (180-200gm) were obtained from chellamuthu Trust (Madurai, India). They were housed in well ventilated cages (3 to4 per cage) maintained at 25 ± 2^0C under 12hour dark/light cycle. They were fed with standard pellet diet and had free accesses to water. The animals were maintained in these conditions for 1 week before the experimental session. Our institutional animal ethical committee (IACE) approved this study.

Ethylene glycol induced Antilithiatic activity

The acclimatized animals were divided into 2 main groups one is prophylactic group and the other curative group each containing 4 sub groups of each 6 animals.

Prophylactic group

Group 1 : Served as normal control and receive normal diet.

Group 2 : Served as lithiatic control and received 1% ethylene glycol in drinking water for 28 days and normal diet.

Group3 : Received 1% ethylene glycol in drinking water along with aruvagai chooranam 200mg/kg for 28days.

Group 4 : Received 1% ethylene glycol in drinking water along with cystone herbal tablet 100mg/kg for 28 days.

Curative group

Group 1 : Served as curative control and receive normal diet.

Group 2 : Served as lithiatic control and received 1% ethylene glycol in drinking water for 28 days and normal diet.

Group3 : Received 1% ethylene glycol in drinking water for 28days then treated with aruvagai chooranam 200mg/kg for next 15 days.

Group 4 : Received 1% ethylene glycol in drinking water for 28 days then treated with cystone 100mg/kg for next 15 days.

Assessment of antilithiatic activity

Urine sampling

For prophylactic treatment on the 24^{th} hour urine samples were collected from rats, housed in metabolic cages, on the 14^{th} day and 28^{th} day urine volume noted. Urinary and serum parameters like calcium, Phosphate, Magnesium, Oxalate, Protein, Uric acid and creatinine concentration were estimated using auto analyzer.

For curative treatment on the 24th hour urine samples were collected from rats, housed in metabolic cages, on the 43rd day urine volume noted. Urinary and serum parameters like calcium, Phosphate, Magnesium, Oxalate, Protein, Uric acid and creatinine concentration were estimated using auto analyzer**.**

Blood sampling

All rats were anaesthetized with diethyl ether; blood was collected from retro orbital puncture of the animal. Then centrifuged for 10 minutes at 3000 r.p.m. to separate the serum. The serum of each animal of all the groups was estimated for calcium, magnesium, oxalate, Phosphate creatinine and uric using their respective kits in the laboratory.

Histopathological studies

The kidney were carefully removed , washed in ice cold 0.15M Kcl. The kidney were fixed in formaldehyde (10%) for H.E (Hematoxylin Eosin) stain. The crystal deposit was visually examined under light microscope.

RESULT

In the present study chronic administration of 1% ethylene glycol aqueous solution to male wistar rats resulted in hyperoxaluria. Urinary concentration of various ions was investigated for prophylactic treatment at the 14th day and 28th day of the study varied drastically, following ethylene glycol treatment. The values of urinary protein, calcium and uric acid at 14th day were 62.78±3.64mg/dl, 5.58±0.50mg/dl, 3.11±0.63mg/dl respectively. On the 28th day the values of urinary protein, calcium and uric acid was 69.83±3.84mg/dl, 6.10±0.67 and 3.28±0.55mg/dl respectively in G1 rats. These values increased significantly in the animals treated with ethylene

glycol in G2. The values of urinary protein, calcium and uric acid at 14th day was 148.16±8.24mg/dl 19.25±1.96mg/dl and 12.41±1.50 respectively and the 28th day values are 156.33±7.25mg/dl, 19.03±1.55mg/dl, 13.55±1.29mg/dl ($p<0.001$) respectively. The animals when treated with aruvagai chooranam 200mg/kg and cystone 100mg/kg body weight respectively in G3 and G4 respectively, the values are restored to near normal values as shown in table 1 and 2.

The values of urinary creatinine, oxalate, phosphate increased significantly in the animals treated with ethylene glycol in G 2 when compared with the normal control animals in G1 in the prophylactic study. The values at 14th day was 1.52±0.12mg/dl, 32.40±3.36mg/dl and 72.58±4.11 respectively and the 28th day values are 1.75±0.20mg/dl, 47.15±4.45mg/dl, 75.58±4.11mg/dl ($p<0.001$) respectively. The animals when treated with aruvagai chooranam 200mg/kg and cystone 100mg/kg body weight respectively in G3 and G4 respectively, the values are restored to near normal values as shown in table 1 and 2.

The values of urinary magnesium in the prophylactic study at 14th day were 4.05±0.43mg/dl, on the 28th day the value was 4.38±0.55mg/dl, in G1 rats. These values decreased significantly in the animals treated with ethylene glycol in G 2. The value urinary magnesium at 14th day was 0.93±0.16mg/dl and the 28th day value was 1.30±0.23mg/dl, ($p<0.001$). The animals when treated with aruvagai chooranam 200mg/kg and cystone 100mg/kg body weight respectively in G3 and G4 respectively, the values are restored to near normal values as shown in table 1 and 2.

In the prophylactic group the serum uric acid, creatinine, phosphate, calcium, and oxalate were increased in the ethylene glycol alone treated rats and the values were regained to the near normal values in aruvagai chooranam 200mg/kg and cystone 100mg/kg treated rats as shown in

the table 3. The serum magnesium level is decreased in the ethylene glycol alone treated rats and the values were regained to the near normal values in aruvagai chooranam 200mg/kg and cystone 100mg/kg treated rats as shown in the table 3.

In the curative group the urine and serum parameters like uric acid, creatinine, phosphate, calcium, and oxalate were increased in the ethylene glycol alone treated rats and the values were regained to the near normal values in aruvagai chooranam 200mg/kg and cystone 100mg/kg treated rats as shown in the table 4 and 5. The urine and serum magnesium levels were decreased in the ethylene glycol alone treated rats and the values were regained to the near normal values in aruvagai chooranam 200mg/kg and cystone 100mg/kg treated rats as shown in the table 4 and 5.

DISCUSSION

In the present study, male rats were selected to induce urolithiasis because the urinary system of male rats resembles that of humans and also earlier studies have shown that the amount of stone deposition in female rats was significantly less. Urinary super saturation with respect to stone-forming constituents is generally considered to be one of the causative factors in calculogenesis. Evidence in previous studies indicated that in response to 14 day period of ethylene glycol (0.75%, v/v) administration, young male albino rats form renal calculi composed mainly of calcium oxalate (4).

The biochemical mechanisms for this process are related to an increase in the urinary concentration of oxalate. Stone formation in ethylene glycol fed animals is caused by

hyperoxaluria, which causes increased renal retention and excretion of oxalate. Similar results have been obtained when rats were treated with ethylene glycol and ammonium oxalate.(5).

In the present study, oxalate and calcium excretion are progressively increased in calculi-induced animals (Group II). Since it is accepted that hyperoxaluria is a far more significant risk factor in the pathogenesis of renal stones than hypercalciuria (6), the changes in urinary oxalate levels are relatively much more important than those of calcium (7). Increased urinary calcium is a factor favoring the nucleation and precipitation of calcium oxalate or apatite (calcium phosphate) from urine and subsequent crystal growth (8). However, aruvagai chooranam 200mg/kg and cystone 100mg/kg lower the levels of oxalate as well as calcium excretion.

An increase in urinary phosphate is observed in calculi induced rats (Group II). Increased urinary phosphate excretion along with oxalate stress seems to provide an environment appropriate for stone formation by forming calcium phosphate crystals, which epitaxially induces calcium oxalate deposition (9). Treatment of aruvagai chooranam 200mg/kg and cystone 100mg/kg restores phosphate level, thus reducing the risk of stone formation. In urolithiasis, the glomerular filtration rate (GFR) decreases due to the obstruction to the outflow of urine by stones in urinary system. Due to this, the waste products, particularly nitrogenous substances such as urea, creatinine and uric acid get accumulated in blood (10). Also, increased lipid peroxidation and decreased levels of antioxidant potential have been reported in the kidneys of rats supplemented with a calculi-producing diet (11,12). In this context, oxalate has been reported to induce lipid peroxidation and to cause renal tissue damage by reacting with polyunsaturated fatty acids in cell membrane (13). In calculi-induced rats (Group II), marked renal damage was seen as indicated by the elevated serum levels of creatinine and uric acid.

However, the curative and prophylactic treatment with aruvagai chooranam 200mg/kg and cystone 100mg/kg causes diuresis and hastens the process of dissolving the preformed stones and prevention of new stone formation in urinary system.

CONCLUSION:

In conclusion, the presented data indicate that administration of the aruvagai chooranam 200mg/kg and cystone 100mg/kg to rats with ethylene glycol induced lithiasis, reduced and prevented the growth of urinary stones, supporting folk information regarding anti urolithiatic activity of the aruvagai chooranam. The mechanism underlying this effect is still unknown, but is apparently related to increased diuresis and lowering of urinary concentrations of stone forming constituents. These effects could conclude the anti urolithiatic property of aruvagai chooranam**.**

TABLE 1: EFFECT OF ARUVAGAI CHOORANAM AND CYSTONE ON URINARY BIOCHEMICAL PARAMETERS ON THE DAY 14

GP	Protein (mg/dl)	Magnesium (mg/dl)	Calcium (mg/dl)	Uric acid (mg/dl)	Creatinine (mg/dl)	Oxalate (mg/dl)	Phosphate (mg/dl)
G1	62.78± 3.64	4.05± 0.43	5.58± 0.50	3.11± 0.63	0.75± 0.06	14.75± 1.71	30.81± 2.15
G2	148.16 ± 8.24**(a)	0.93 ± 0.16**(a)	19.25 ± 1.96**(a)	12.41 ± 1.50**(a)	1.52 ± 0.12**(a)	32.40 ± 3.36**(a)	72.58 ± 4.11**(a)
G3	74.35± 5.23**(b)	3.10± 0.65**(b)	6.57± 0.45**(b)	4.10± 0.65**(b)	0.87± 0.07**(b)	17.56± 1.47**(b)	33.34± 2.36**(b)
G4	80.22± *6.30***(b)	*2.80* ± *0.55***(b)	*7.78* ± *0.62***(b)	*5.15* ± *0.91***(b)	0.92 ± 0.08**(b)	*20.10* ± *1.85***(b)	36.26 ± 2.50**(b)

-
-
- Values are expressed as Mean± SEM
- Values were find out by using ONE WAY ANOVA Followed by Newman keul's multiple range test
- **(a)values were significantly different from normal control G1 at P< 0.01
- **(b) values were significantly different from Lithiatic control G2 at P<0.01

TABLE 2:EFFECT OF ARUVAGAI CHOORANAM AND CYSTONE ON URINARY PARAMETERS IN PROPHYLACTIC TREATMENT OF ANIMALS

GROUP	Protein (mg/dl)	Magnesium (mg/dl)	Calcium (mg/dl)	Uric acid (mg/dl)	Creatinine (mg/dl)	Oxalate (mg/dl)	Phosphate (mg/dl)
G1	69.83 ±3.84	4.38 ±0.55	6.10 ±0.67	3.28 ±0.55	0.81 ±0.06	15.25 ±1.49	32.48 ±2.24
G2	156.33 ±7.25**(a)	1.30 ±0.23**(a)	19.03 ±1.55**(a)	13.55 ±1.29**(a)	1.75 ±0.20**(a)	47.15 ±4.45**(a)	75.58 ±4.11**(a)
G3	76.89± 2.89**(b)	3.25± 0.67**(b)	7.58± 0.63**(b)	5.10± 0.87**(b)	0.88± 0.07**(b)	19.32± 1.98**(b)	35.62± 2.32**(b)
G4	*86.63 ±3.65***(b)	*2.95 ±0.35***(b)	*9.52 ±0.45***(b)	*7.92 ±0.74***(b)	*0.95 ±0.09***(b)	*24.05 ±2.65***(b)	40.25 ±2.75**(b)

- Values are expressed as Mean± SEM
- Values were find out by using ONE WAY ANOVA Followed by Newman keul's multiple range test
- **(a)values were significantly different from normal control G1 at P< 0.01
- **(b) values were significantly different from Lithiatic control G2 at P<0.01

TABLE 3: EFFECT OF ARUVAGAI CHOORANAM AND CYSTONE ON SERUM PARAMETERS IN PROPHYLACTIC TREATMENT OF ANIMALS

GP	Magnesium (mg/dl)	Calcium (mg/dl)	Uric acid (mg/dl)	Creatinine (mg/dl)	Oxalate (mg/dl)	Phosphate (mg/dl)
G1	4.73 ±0.68	9.36 ±1.24	3.45 ±0.40	0.56 ±0.06	6.6 ±0.57	12.06 ±1.43
G2	1.26 ±0.36**(a)	18.05 ±2.42**(a)	9.7 ±1.10**(a)	1.01 ±0.13**(a)	12.60 ±1.61**(a)	26.01 ±3.25**(a)
G3	4.10± 0.54**(b)	10.74± 1.34**(b)	3.90± 0.54**(b)	0.68± 0.08**(b)	7.23± 0.12**(b)	16.29± 0.87**(b)
G4	*3.42 ±0.42**(b)*	*12.26 ±1.42**(b)*	*4.40 ±0.55**(b)*	*0.82 ±0.10**(b)*	*8.05 ±0.65**(b)*	21.05 ±2.12**(b)

- Values are expressed as Mean± SEM
- Values were find out by using ONE WAY ANOVA Followed by Newman keul's multiple range test
- **(a)values were significantly different from normal control G1 at P< 0.01
- **(b) values were significantly different from Lithiatic control G2 at P<0.01

TABLE 4: EFFECT OF ARUVAGAI CHOORANAM AND CYSTONE ON URINARY BIOCHEMICAL PARAMETERS IN CURATIVE TREATMENT OF ANIMALS

GP	Protein (mg/dl)	Magnesium (mg/dl)	Calcium (mg/dl)	Uric acid (mg/dl)	Creatinine (mg/dl)	Oxalate (mg/dl)	Phosphate (mg/dl)
G1	73.45 ±3.84	4.66 ±0.72	6.40 ±0.65	3.80 ±0.78	14.95 ±2.15	19.21 ±1.76	35.05 ±2.90
G2	170.83 ±7.97**(a)	1.51 ±0.22**(a)	17.96 ±2.11**(a)	15.00 ±2.52**(a)	81.88 ±4.14**(a)	49.98 ±3.45**(a)	80.28 ±4.75**(a)
G3	80.34± 2.98**(b)	4.03± 0.38**(b)	7.87± 0.88**(b)	5.10± 0.56**(b)	25.63± 2.67**(b)	22.95± 2.54**(b)	38.43± 2.03**(b)
G4	90.66 ±3.82**(b)	3.50 ±0.45**(b)	10.28 ±1.05**(b)	8.6 ±1.08**(b)	32.93 ±3.30**(b)	26.05 ±2.25**(b)	41.33 ±2.83**(b)

- Values are expressed as Mean± SEM
- Values were find out by using ONE WAY ANOVA Followed by Newman keul's multiple range test
- **(a)values were significantly different from normal control G1 at P< 0.01
- **(b) values were significantly different from Lithiatic control G2 at P<0.01

TABLE 5: EFFECT ARUVAGAI CHOORANAM AND CYSTONE ON SERUM PARAMETERS IN CURATIVE TREATMENT OF ANIMALS

GP	Magnesium (mg/dl)	Calcium (mg/dl)	Uric acid (mg/dl)	Creatinine (mg/dl)	Oxalate (mg/dl)	Phosphate (mg/dl)
G1	5.16 ±0.92	10.38 ±1.29	4.12 ±0.89	0.98 ±0.19	8.8 ±0.96	15.62 ±2.01
G2	1.92 ±0.48**(a)	24.06 ±2.42**(a)	12.06 ±2.38**(a)	2.82 ±0.62**(a)	17.46 ±1.20**(a)	29.90 ±3.06**(a)
G3	4.76± 0.83**(b)	11.89± 1.34**(b)	5.43± 0.90**(b)	1.10± 0.22**(b)	9.78± 1.08**(b)	16.48± 2.10**(b)
G4	4.05 ±0.79**(b)	13.36 ±1.10**(b)	6.65 ±0.95**(b)	1.39 ±0.45**(b)	10.53 ±1.10**(b)	17.03 ±2.42**(b)

- Values are expressed as Mean± SEM
- Values were find out by using ONE WAY ANOVA Followed by Newman keul's multiple range test
- **(a)values were significantly different from normal control G1 at P< 0.01
- **(b) values were significantly different from Lithiatic control G2 at P<0.01

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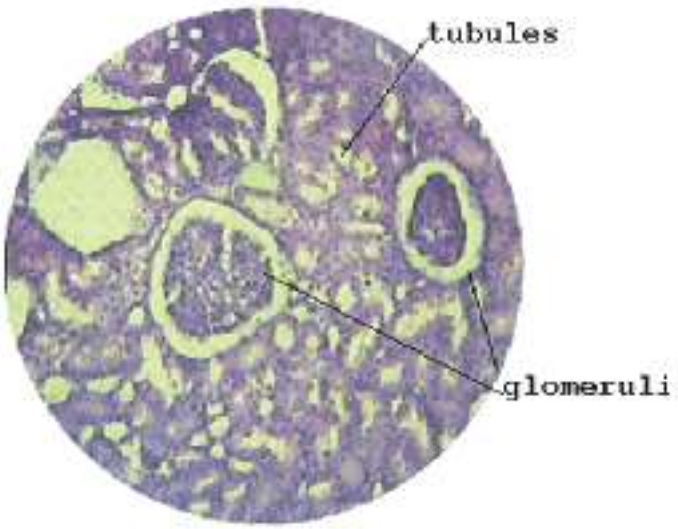
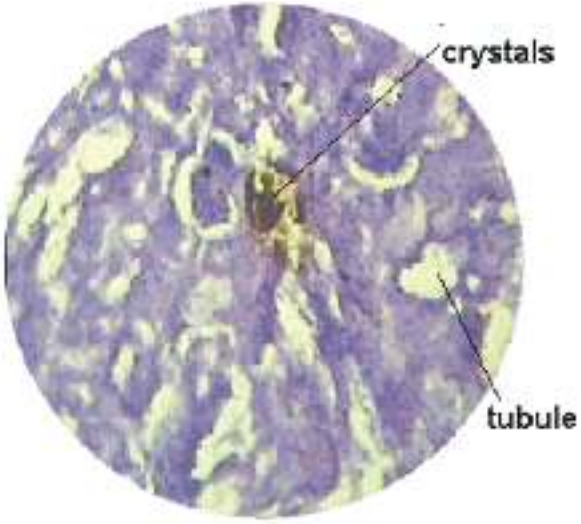
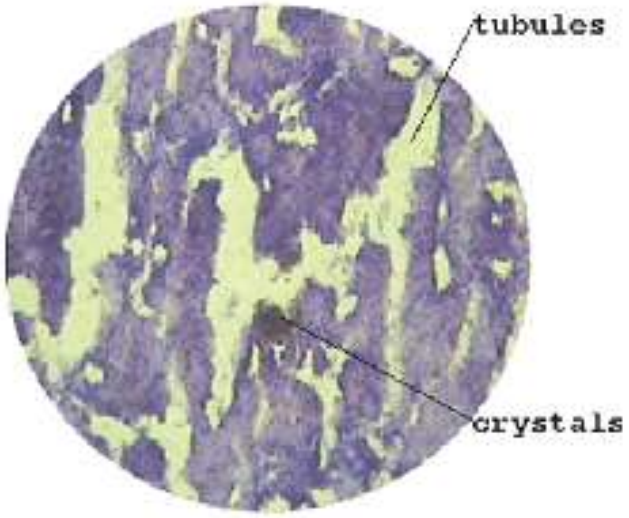
Kidney Section of GP-1(Normal Control) Rats



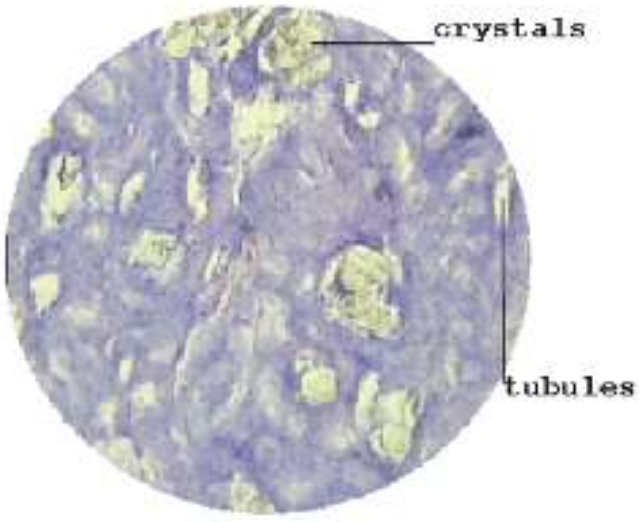
Kidney section of GP-2 (Lithiatic control)



Kidney section of GP- 3
(Prophylatic treatment, Aruvagai chooranam)

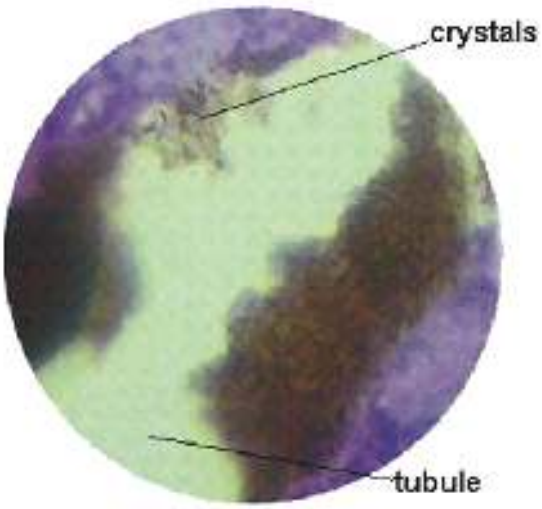


Kidney section of GP- 4
(Prophylatic treatment, cystone)

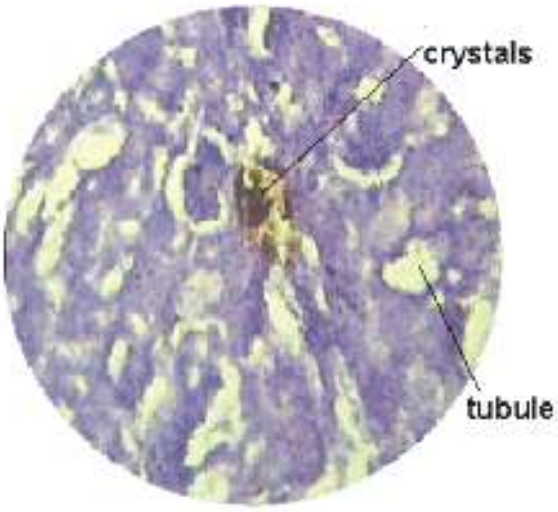


CURATIVE TREATMENT

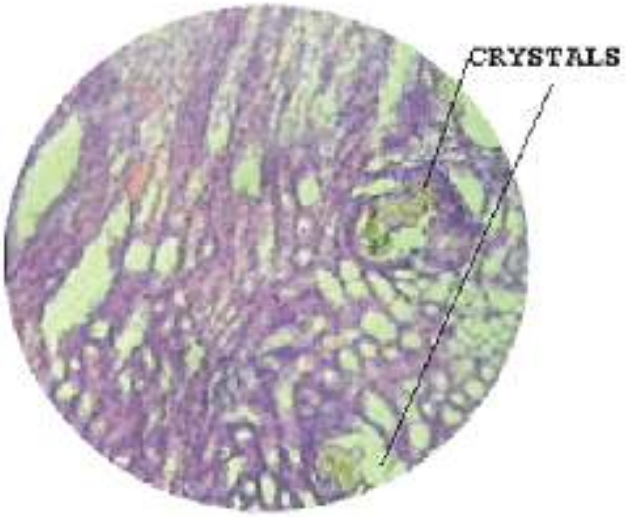
Kidney section of GP - 2 (curative treatment, Lithiatic control)



Kidney section of GP- 3
(curative treatment, Aruvagai chooranam)



Kidney section of GP- 4
(Curative treatment, cystone tablet)



MICROBIOLOGICAL ANALYSIS

MALAR MICRO DIAGNOSTIC CENTRE

134/59-1, Tiruchendur Road, Palayamkottai - 627002

Phone - Lab : 2583954, Res : 2583955

REPORT OF MICROBIOLOGICAL ANALYSIS OF

ARUVAGAI CHOORANAM

S.No	Test Drug	Organism (Culture)	Susceptibility	Test zone size	Control zone size
1.	ARUVAGAI CHOORANAM	Escherichia coli	Sensitive	20mm	24mm
2.		Klebsiella	Resistant		
3.		Proteus	Resistant		
4.		Staphylococcus aureus	Resistant		
5.		Streptococcus pneumonia	Moderately sensitive	16mm	24mm
6.		Pseudomonas aeruginosa	Sensitive	19mm	21mm

Dr.R.NAPOLEON B.Sc. M.D

CONSULTANT MICROBIOLOGIST.

TIRUNELVELI.

Dear Doctor,

Thank you for your reference. If the result is not correlating with the clinical impression, please inform us to repeat the test with a fresh sample.

Microbiological Analysis

Pseudomonas aeruginosa-Sensitive

Escherichia coli - Sensitive

Streptococcus pneumonia-Moderately Sensitive

BIO-CHEMICAL ANALYSIS

Annexure - II

BIO-CHEMICAL ANALYSIS

BIOCHEMICAL ANALYSIS OF ARUVAGAI CHOORANAM

Preparation of the extract

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

Qualitative 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 2ml of 4% Ammonium oxalate solution.	A white precipitate formed.	Indicates 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.	A white precipitate is formed.	Indicates Presence of Chloride.

S.No	EXPERIMENT	OBSERVATION	INFERENCE
4.	**TEST FOR CARBONATE** The extract is treated with concentrated Hydrochloric Acid.	No brisk effervessence 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 IRON *Ferric*** The extract is treated with Glacial acetic acid and Potassium ferrocyanide	No Blue colour is formed.	Absence of Ferric Iron.
7.	**TEST FOR IRON *Ferrous*** The extract is treated with concentrated Nitric acid and Ammonium thiocyanate solution.	Blood red colour is formed.	Indicates the presence of Ferrous Iron.
8.	**TEST FOR PHOSPHATE** The extract is treated with Ammonium molybdate and conc. 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.

S.No	EXPERIMENT	OBSERVATION	INFERENCE
11.	**TEST FOR UNSATURATION** Potassium permanganate solution is added to the little of the extract.	It does not decolourisation.	Absence of unsaturated compounds
12.	**TEST FOR REDUCING SUGAR** 5ml of Benedict's quantitative solution is taken in a test tube and allowed to boil for 2 minutes and 8-10 drops of the extract is added and boiled again for 2 minutes.	No Colour change occured.	Absence of Reducing sugar.
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 well.	No Violet colour is formed.	Absence of Amino acid .
14.	**TEST FOR ZINC** The extract is treated with Pottasium Ferrocyanide	No white precipitate is formed	Absence of Zinc

STONE ANALYSIS REPORT

KIDNEY STONES COLLECTED FROM PATIENTS

Mr.A.Chelladurai
O.P.No. 64882 Age 33/Male

Stone Analysis Report
Calcium Oxalate and Uric Acid

MEDALL
DIAGNOSTICS

Name	: Mr. CHELLA DURAI	Register On	: 08/01/2013 9:55 PM
PID No.	: TEN 33850	Collection On	: 08/01/2013 10:59 PM
SID No.	: 613031384	Report On	: 12/01/2013 4:01 PM
Age / Sex	: 33 Year(s) / Male	Printed On	: 15/01/2013 9:05 PM
Ref. Dr	: DR. NAMASIVAYAM.,MD.,(SIDDHA) PALAYAMKOTTAI	OP / IP	: OP

LABORATORY REPORT

Investigations	Observed Values	Unit	Biological Reference Interval
BIOCHEMISTRY			
STONE ANALYSIS/ CALCULUS STUDY			
Calcium Oxalate (Stone)	Present		
Non Oxalate Calcium (Stone)	Present		
Carbonate (Stone)	Absent		
Uric Acid (Stone)	Present		
Bilirubin (Stone)	Absent		
Cholesterol (Stone)	Absent		

-- End of Report --

The results pertain to sample tested.

V. Pugalendhi

Dr. V. Pugalendhi,
Consultant Biochemist

KIDNEY STONES COLLECTED FROM PATIENTS

Mr.S. Velayutham
O.P.No. 59399 Age 41/Male

Stone Analysis Report
Calcium Oxalate and Uric Acid

MEDALL
DIAGNOSTICS

Name	: Mr. VELAYUTHAM	Register On	: 08/01/2013 9:55 PM
PID No.	: TEN 33852	Collection On	: 08/01/2013 10:59 PM
SID No.	: 6130 1386	Report On	: 12/01/2013 4:20 PM
Age / Sex	: 41 Year(s) / Male	Printed On	: 15/01/2013 9:05 PM
Ref. Dr	: DR. NAMASIVAYAM.,MD.,(SIDDHA) PALAYAMKOTTAI	OP / IP	: OP

LABORATORY REPORT

Investigations	Observed Values	Unit	Biological Reference Interval
BIOCHEMISTRY			
STONE ANALYSIS/ CALCULUS STUDY			
Calcium Oxalate (Stone)	Present		
Non Oxalate Calcium (Stone)	Present		
Carbonate (Stone)	Absent		
Uric Acid (Stone)	Present		
Bilirubin (Stone)	Absent		
Cholesterol (Stone)	Absent		

-- End of Report --

The results pertain to sample tested. Page 1 of 1

Dr.Ramesh Iravatham
Consultant Biochemist

KIDNEY STONES COLLECTED FROM PATIENTS

Mr.K.Ganapathy
O.P.No. 78119 Age 50/Male

Stone Analysis Report
Calcium Oxalate and Uric Acid

MEDALL
DIAGNOSTICS

Name	: Mr. GANAPATHY	Register On	: 08/01/2013 9:55 PM
PID No.	: TEN 33851	Collection On	: 08/01/2013 10:59 PM
SID No.	: 6130.1385	Report On	: 12/01/2013 4:20 PM
Age / Sex	: 50 Year(s) / Male	Printed On	: 15/01/2013 9:04 PM
Ref. Dr	: DR. NAMASIVAYAM.,MD.,(SIDDHA) PALAYAMKOTTAI	OP / IP	: OP

LABORATORY REPORT

Investigations	Observed Values	Unit	Biological Reference Interval
BIOCHEMISTRY -			
STONE ANALYSIS/ CALCULUS STUDY			
Calcium Oxalate (Stone)	Present		
Non Oxalate Calcium (Stone)	Present		
Carbonate (Stone)	Absent		
Uric Acid (Stone)	Present		
Bilirubin (Stone)	Absent		
Cholesterol (Stone)	Absent		

-- End of Report --

The results pertain to sample tested.

Dr.Ramesh Iravatham
Consultant Biochemist

CASE SHEET PROFORMA

GOVERNMENT SIDDHA MEDICAL COLLEGE AND HOSPITAL
PALAYAMKOTTAI, TIRUNELVELI DISTRICT

POST-GRADUATE DEPARTMENT OF POTHU MARUTHUVAM

AN OPEN CLINICAL TRIAL OF "ARUVAGAI CHOORANAM" (INTERNAL) FOR "KALLADAIPPU (UROLITHIASIS)"

FORM: I - SCREENING FORM

1. Sl. No_____: _____ 2. OP / IP No _____: _____ 3.
   Bed No_____: _____ 4. Name _____: _____ 5.
   Age_____: _____ 6. Gender_____: _____ 7.
   Postal Address :

I. INCLUSION CRITERIA

Specific Criteria

1. Age: 25 – 75 Years
2. Gender: Both Male and Female
3. Colicky pain: Loin / Groin, Loin to Groin
4. Haematuria
5. Pyuria
6. Dysuria
7. Oliguria

Non-specific Criteria

1. Diabetes mellitus
2. Systemic Hypertension
3. Crystaluria

II. EXCLUSION CRITERIA

1. Subacute appendicitis
2. Cholecystitis
3. Amoebic colitis
4. Pyelonephritis
5. Perinephric abscess
6. Cystitis and UTI
7. Sexually transmitted disease
8. Pelvic inflammatory disease

9. Post-renal azotemia
10. Obstructive uropathy

GOVERNMENT SIDDHA MEDICAL COLLEGE AND HOSPITAL
PALAYAMKOTTAI, TIRUNELVELI DISTRICT

POST-GRADUATE DEPARTMENT OF POTHU MARUTHUVAM

AN OPEN CLINICAL TRIAL OF "ARUVAGAI CHOORANAM" (INTERNAL) FOR "KALLADAIPPU (UROLITHIASIS)"

FORM: II - CONSENT FORM

CERTIFICATE BY INVESTIGATOR

I certify that I have disclosed all the details about the study in the terms readily understood by the patient.

Date: ……. Signature: ……..……..

CONSENT BY PATIENT

I have been informed to my satisfaction, by the attending physician, the purpose of the clinical trial, and the nature of drug treatment and follow-up including the laboratory investigations to be performed to monitor and safeguard my body functions.

I am aware of my right to opt out of the trial at any time during the course of the trial without having to give the reasons for doing so.

I, exercising my free power of choice, hereby give my consent to be included as a subject in the clinical trial for the disease "Kalladaippu" using the siddha drugs "Aruvagai Chooranam" (internal).

Signature :……..……..

Date : ……. Name :……...……

அரசு சித்த மருத்துவக் கல்லூரி மற்றும் மருத்துவமனை

பாளையங்கோட்டை

பட்ட மேற்படிப்பு பொது மருத்துவத்துறை

கல்லடைப்பு நோய்க்கு மருந்தாக அறுவகைச் சூரணம் பரிகரிப்புத்திறனைக் கண்டறியும் மருத்துவ ஆய்வு

ஒப்புதல் படிவம்
ஆய்வாளரால் சான்றளிக்கப்பட்டது.

நான் இந்த ஆய்வு குறித்த அனைத்து விபரங்களையும் நோயாளிக்கு புரியும் வகையில் எடுத்துரைத்தேன் என உறுதியளிக்கிறேன்.

தேதி : கையொப்பம் .....

இடம் : பெயர் .....

நோயாளியின் ஒப்புதல்

என்னிடம் இந்த மருத்துவ ஆய்வின் காரணத்தையும் மருந்தின் தன்மை மற்றும் மருத்துவ வழிமுறையைப் பற்றியும் தொடர்ந்து எனது உடல் இயக்கத்தை கண்காணிக்கவும், அதனைப் பாதுகாக்கவும் பயன்படும் மருத்துவ ஆய்வுக்கூட பரிசோதனைகள் பற்றி திருப்தி அளிக்கும் வகையில் ஆய்வு மருத்துவரால் விளக்கிக் கூறப்பட்டது.

நான் இந்த மருத்துவ ஆய்வின்போது காரணம் எதுவும் கூறாமல் எப்பொழுது வேண்டுமானாலும் இந்த ஆய்விலிருந்து என்னை விடுவித்துக் கொள்ளும் உரிமையை தெரிந்திருக்கிறேன்.

நான் என்னுடைய சுதந்திரமாக தேர்வு செய்யும் உரிமையைக் கொண்டு கல்லடைப்பு நோய்க்கு மருந்தாக அறுவகைச் சூரணம் பரிகரிப்புத்திறனைக் கண்டறியும் மருத்துவ ஆய்விற்கு என்னை உட்படுத்த ஒப்புதல் அளிக்கிறேன்.

தேதி : கையொப்பம் .....

இடம் : பெயர் .....

GOVERNMENT SIDDHA MEDICAL COLLEGE AND HOSPITAL
PALAYAMKOTTAI, TIRUNELVELI DISTRICT

POST-GRADUATE DEPARTMENT OF POTHU MARUTHUVAM

AN OPEN CLINICAL TRIAL OF "ARUVAGAI CHOORANAM" (INTERNAL) FOR "KALLADAIPPU (UROLITHIASIS)"

FORM: III – CASE SHEET PROFORMA (OP & IP)

1. Sl. No : 2. OP/IP No :
3. Bed No : 4. Name :
5. Age : 6. Gender :
7. Nationality : 8. Religion :
9. Occupation : 10. Socio-economic Status :
11. Postal Address :

12. Date of Admission : 13. Date of Discharge :
14. Number of days treated

15. Result : GOOD / FAIR / POOR 16. Diagnosis :

Medical Officer

17. COMPLAINTS & DURATION:

18. HISTORY OF PRESENT ILLNESS:

19. PAST HISTORY	:	YES	NO
Hypertension	:	☐	☐
Diabetes mellitus	:	☐	☐
Renal calculi	:	☐	☐
Ureteric obstruction	:	☐	☐
Prolonged immobilization	:	☐	☐
Renal tuberculosis	:	☐	☐
Amyloidosis	:	☐	☐
ENDOCRINE DISORDERS	:	☐	☐
Hyperparathyroidism	:	☐	☐
Cushing syndrome	:	☐	☐
CONGENITAL DISORDER HISTORY	:	YES	NO
Medullary spongy kidney	:	☐	☐
Myelo proliferative disorder	:	☐	☐
TREATMENT HISTORY	:	☐	☐
Oral diuretics	:	☐	☐
Non-steroid anti-inflammatory drugs	:	☐	☐
Surgery for urinary calculus	:	☐	☐
Extra corporeal shockwave lithotripsy	:	☐	☐
20. FAMILY HISTORY	:	☐	☐
Gout	:	☐	☐
Cystinuria	:	☐	☐
Xanthinuria	:	☐	☐
21. HABITS	:	☐	☐
DIET HISTORY	:	☐	☐
Vegetarian foods	:	☐	☐

High intake of dairy products	:	☐	☐
Low calcium diet	:	☐	☐
Nuts	:	☐	☐
Non-vegetarian foods	:	☐	☐
Meat	:	☐	☐
Poultry	:	☐	☐
Fish	:	☐	☐
Drinks / Tobacco & Betel chewing / Smoking:			
Alcohol	:	☐	☐
Tea	:	☐	☐
Coffee	:	☐	☐
Milk	:	☐	☐
Smoking	:	☐	☐
Tobacco chewing	:	☐	☐
Betel chewing	:	☐	☐
22. PERSONAL HISTORY	:	☐	☐

23. GENERAL EXAMINATIONS

a) Consciousness	:	☐	☐
b) Orientation	:	☐	☐
c) Decubitus	:	☐	☐
d) Body weight (Kg)	:	☐	☐
e) Height (cm)	:	☐	☐

f) Body Temperature (° F) : ☐ ☐

g) Blood Pressure (mm Hg) : ☐ ☐

h) Pulse Rate / min. : ☐ ☐

i) Heart Rate / min. : ☐ ☐

j) Respiratory Rate / min : ☐ ☐

k) Anaemia : ☐ ☐

l) Jaundice : ☐ ☐

m) Clubbing : ☐ ☐

n) Cyanosis : ☐ ☐

o) Pedal Oedema : ☐ ☐

p) Lymphadenopathy : ☐ ☐

q) Jugular venous pulsation : ☐ ☐

24. CLINICAL EXAMINATION OF ABDOMEN

a) Inspection :

b) Palpation :

c) Percussion :

d) Auscultation :

25. CLINICAL ASSESSMENT :

Renal colicky pain : No ☐ Mild ☐

Moderate ☐ Severe ☐

Sites : Loin ☐ Renal Angle ☐

Lower Abdomen ☐

Radiating areas : Groin ☐ Thigh ☐

External Genitalia ☐

Adominal distension	:	☐	☐
Burning micturation	:	☐	☐
Obstruction during micturation	:	☐	☐
Anuria	:	☐	☐
Oliguria	:	☐	☐
Concentric urination	:	☐	☐
Haematuria	:	☐	☐
Pyuria	:	☐	☐
Nausea	:	☐	☐
Vomiting	:	☐	☐
Fever & Chills	:	☐	☐
Sweating	:	☐	☐

26. EXAMINATION OF OTHER SYSTEMS:

1. CVS	:	☐	☐
2. RS	:	☐	☐
3. CNS	:	☐	☐

SIDDHA ASPECTS

1. KAALAM

1. Vatham ☐ 2. Pitham ☐ 3. Kabam ☐

2. THEGI

1. Vatham ☐ 2. Pitham ☐ 3. Kabam ☐ 4. Thontha Thegi ☐

3. THINAI

1. Kurinji ☐ 2. Mullai ☐ 3. Marutham ☐ 4. Neithal ☐
5. Paalai ☐

4. PARUVAKAALAM

1. Kaar Kaalam ☐ 2. Koothir Kaalam ☐ 3. Munpani Kaalam ☐
4. Pinpani Kaalam ☐ 5. Illavenir Kaalam ☐ 6. Muduvenir Kaalam ☐

5. GUNAM

1. Sathuvam ☐ 2. Rasatham ☐ 3. Thamasam ☐

6. IYMPORIGAL

1. Mei	☐	☐	.....
2. Vaai	☐	☐	.....
3. Kan	☐	☐	.....
4. Mookku	☐	☐	.....
5. Sevi	☐	☐	.....

7. KANMENDHIRIUM / KANMAVIDAYAM

1. Kai	☐	☐	.....
2. Kaal	☐	☐	.....
3. Vaai	☐	☐	.....
4. Enuvaai	☐	☐	.....
5. Karuvaai	☐	☐	.....

8. UYIR THATHUKKAL

I. VATHAM

1. Piraanan	☐	☐	.....
2. Abaanan	☐	☐	.....
3. Viyaanan	☐	☐	.....
4. Uthaanan	☐	☐	.....
5. Samaanan	☐	☐	.....

6. Naagan ☐ ☐ .....
7. Koorman ☐ ☐ .....
8. Kirukaran ☐ ☐ .....
9. Devathathan ☐ ☐ .....
10. Dhananjeyan ☐ ☐ .....

II. PITHAM:

1. Analam ☐ ☐ .....
2. Ranjagam ☐ ☐ .....
3. Saathagam ☐ ☐ .....
4. Aalosagam ☐ ☐ .....
5. Prasagam ☐ ☐ .....

III. KABAM:

1. Avalambagam ☐ ☐ .....
2. Kilethagam ☐ ☐ .....
3. Pothagam ☐ ☐ .....
4. Tharpagam ☐ ☐ .....
5. Santhigam ☐ ☐ .....

8. UDAL THAATHUKKAL:

1. Saaram ☐ ☐ .....
2. Senneer ☐ ☐ .....
3. Oon ☐ ☐ .....
4. Kozhuppu ☐ ☐ .....
5. Enbu ☐ ☐ .....
6. Moolai ☐ ☐ .....
7. Sukkilam / Suronitham ☐ ☐ .....

9. ENVAGAI THERVUGAL

1. Naadi ☐ ☐ .....
2. Sparisam ☐ ☐ .....
3. Naa ☐ ☐ .....
4. Niram ☐ ☐ .....
5. Mozhi ☐ ☐ .....
6. Vizhi ☐ ☐ .....
7. Malam ☐ ☐ .....

a. Niram ☐ ☐ .....

b. Nura ☐ ☐ .....

c. Kirumi ☐ ☐ .....

d. Thanmai ☐ ☐ .....

i. Irugal ☐ ii. Ilagal ☐

8. Moothiram:

I. NEERKKURI:

	Normal	Affected	
a. Niram	☐	☐	.....
b. Manam	☐	☐	.....
c. Edai	☐	☐	.....
d. Nurai	☐	☐	.....
e. Enjal	☐	☐	.....

II. NEIKKURI:

Before Treatment	Vatha Neer ☐	Pitha Neer ☐	Kaba Neer ☐ .....
After Treatment	Vatha Neer ☐	Pitha Neer ☐	Kaba Neer ☐ .....

GOVERNMENT SIDDHA MEDICAL COLLEGE AND HOSPITAL
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FORM: IV – LABORATORY INVESTIGATIONS

1.	Sl. No	:		2.	OP/IP No	:	
3.	Bed No	:		4.	Name	:	
5.	Age	:		6.	Gender	:	

I. BLOOD

		Before Treatment	After Treatment
1.	TC (Cells/mm^3)		
2.	DC (%):		
	a) Neutrophils		
	b) Lymphocytes		
	c) Monocytes		
	d) Eosinophils		
3.	ESR (mm)		
	a) ½ hour		
	b) 1 hour		
4.	Haemoglobin		
5.	Blood sugar		
6.	Blood urea		
7.	Serum creatinine		
8.	Total cholesterol		
9.	Serum bilirubin		

II. URINE

		Before Treatment	After Treatment
1.	Albumin		
2.	Sugar		
3.	Epithelial cells		
4.	Pus cells		
5.	Red Blood Cells		
6.	Casts/Crystals		

III. **MOTION**

		Before Treatment	After Treatment
1.	Ova		
2.	Cyst		
3.	Occult blood		
4.	Pus cells		

IV. PLAIN X–RAY ABDOMEN (KUB)

V. INTRA-VENOUS PYELOGRAM

VII. USG – ABDOMEN (KUB)

Before Treatment:

After Treatment:

VIII. URINARY STONE ANALYSIS

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FORM: V – CLINICAL ASSESSMENT

1.	Sl. No	:		2.	OP/IP No	:	
3.	Bed No	:		4.	Name	:	
5.	Age	:		6.	Gender	:	

CLINICAL EXAMINATION OF ABDOMEN

		Before Treatment	After Treatment
1.	Inspection		
2.	Palpation		
3.	Percussion		
4.	Auscultation		

CLINICAL ASSESSMENT:

		Before Treatment	After Treatment
1.	Renal colicky pain		
	a) No		
	b) Mild		
	c) Moderate		
	d) Severe		
2.	Sites		
	a) Loin		
	b) Renal Angle		
	c) Lower Abdomen		

3.	Radiating Areas				
	a) Groin				
	b) Thigh				
	c) External Genitalia				
		Before Treatment		After Treatment	
		Yes	No	Yes	No
4.	Abdominal distension				
5.	Burning micturation				
6.	Obstruction during micturation				
7.	Anuria				
8.	Oliguria				
9.	Concentric urination				
10.	Haematuria				
11.	Pyuria				
12.	Nausea				
13.	Vomiting				
14.	Fever & Chills				
15.	Sweating				

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FORM: VI - PATIENT WITHDRAWAL FORM

1.	Sl. No	:		2.	OP/IP No	:	
3.	Bed No	:		4.	Name	:	
5.	Age	:		6.	Gender	:	
7.	Postal Address	:					

Complaints and Duration:

Irregular and Duration:

Other causes:

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