

# Documentation of *Neikuri* (Urine Sign-Oil Drop Test) for *Azhalkeelvayu* (Osteoarthritis of Knee Joint)-An Observational Study

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## ABSTRACT

**Objectives:** Osteoarthritis is one of the common degenerative disorders occurring worldwide. Among the different types of osteoarthritis, osteoarthritis of the knee is more common. The current lifestyle triggers this age-related disorder earlier. But what triggers this so early is a gaze area. The Traditional Siddha system of Medicine (TSM) uses the three humoral theories (*Mukkutram*) to classify the disease. *Neikuri* is a prognosis tool of TSM. It shows which humor triggered the disease, and the prognosis of the disease can be determined. **Materials and Methods:** *Neikuri* is a procedure that uses urine to derive the humor causing the disorder by dropping oil on the collected urine. The *Neikuri* of 50 patients diagnosed with osteoarthritis of the knee was observed and recorded. **Results:** From the observation, *Vatham*, *Pittam*, *Kabham*, *Vathapitham*, *Pithavatham*, *Kabhapitham*, and *Pithakabham* were identified as the leading humors triggering the disease in the 50 patients. *Neikuri* is a noninvasive prognosis tool peculiar to the TSM. **Conclusion:** This method has a shortfall: while we use this method for an acute disorder showing clinical progress, the patient may have an underlying, undiagnosed chronic disease with poor progress, resulting in little or no progress with the *Neikuri* procedure.

**Keywords:** Documentation, Envagai thervu, Mukkutram, Siddha.

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## INTRODUCTION

Around 528 million individuals worldwide suffered from osteoarthritis in 2019, a 113% rise from 1990 (World Health Organization, 2023). Approximately 60% of individuals with osteoarthritis are female, and 73% of those affected are over 55. The knee is the most affected joint, with a prevalence of 365 million, followed by the hand and hip. Rehabilitation could be beneficial for 344 million individuals with moderate to severe osteoarthritis. Osteoarthritis is predicted to become more commonplace worldwide because of aging populations, rising obesity and injury rates, and other factors. Age-related osteoarthritis cannot be prevented.

Inflammation of one or more joints is known as arthritis. The main signs of arthritis are pain, swelling, and stiffness (American Academy of Orthopaedic Surgeons, 2021). The condition can affect any joint in the body, although it most frequently affects the

knee. Walking and climbing stairs are just two of the numerous daily tasks that knee arthritis can make difficult. For many, it is a significant contributor to lost productivity and severe impairment.

## Symptoms

Pain that gets worse with movement and gets better with relaxation; joint stiffness, particularly in the morning or after a brief time of rest (Indian Council of Medical Research, 2024).

- A reduction in knee Range of Motion (ROM), which makes it challenging to walk, climb stairs, get in and out of a car or chair, and stand up from a seated position.
- Crackling and creaking noises when the knee moves.
- There may be swelling and a warm feeling in the joint.

## Signs

- Tenderness in the joint lines.
- Patello-femoral crepitus.
- Reduced ROM.
- Deformity (usually varus and flexion).
- There may be synovial thickening and joint effusion.



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## Kellgren and Lawrence (radiological) classification Osteoarthritis of knee

- **Grade 0:** There are no radiological signs of OA.
- **Grade 1:** Potential osteophytic lipping and doubtful Joint Space Narrowing (JSN).
- **Grade 2:** Anteroposterior weight-be a Regular circle radiograph with definite osteophytes and potential JSN.
- **Grade 3:** Sclerosis, many osteophytes, obvious JSN, and potential bony deformity.
- **Grade 4:** Significant JSN, large osteophytes, severe sclerosis, and a clear bony deformity.

## Common diagnostic tool

### X-ray

These imaging procedures offer fine-grained images of dense tissues like bone. They can aid in differentiating between different types of arthritis. An X-ray of an arthritic knee may reveal bone abnormalities, the development of bone spurs (osteophytes), and a narrowing of the joint space.

### More tests

A Computerized Tomography (CT) or Magnetic Resonance Imaging (MRI) scan may occasionally be required to assess the state of your knee's soft tissues and bones.

The above-mentioned osteoarthritis can be related to *Azhal keel vaayu* in the Traditional Siddha system of Medicine (TSM), in accordance with the WHO international standard terminologies on Siddha medicine (World Health Organization, 2022).

## Azhal keel vayu

'Azhal' means heat or fire (*Azhal*, one of the three humors). 'Keel' means joint, and 'Vayu' means air (*Vali*, one of the three humors) (Sanmugavelu, 2017). *Azhal keel vayu* can be related to osteoarthritis (National Institute of Siddha, 2019). *Azhal keel vayu* affecting the knee joint is known as *Peru mottu vatham* (Kannan Rajaram, 2024).

Vaṭivurra perumuṭṭuvātam vitamānatu vatuvaiyē kēḷivitāy  
vaḷamākavē irukāl muṭṭutaṇil viṇkum valutāy nimiroṭṭātirukkum  
Kaṭitākavē poruntiṭa matilūḷaivu vali kaḷaittu mikutiyākum  
kālumatilē nīru kuttum ūciyaip pōl kaṭu kuṇṭiṇakam cuḷḷeṇa  
Maṭiyātu kuḷiru paṇiyuṭal uḷaivum cōmpalum māṭṭum irukāl  
tarippum  
maruviyuṭal meliyumē nittiraiyatiṇṇiyē mārāve tiṇam peruki  
ayarum  
Paṭi nīriluru pērkaḷ ariya veku teḷivāy pāṭu kuṇumuṇiyiṇuraiyāy

pakaru tamiḷāka itu ulakariya ōtiṇēṇa Paṇpu tamiḷākavē  
tāṇ-Vatha noi nithanam (Vaidya Chinthamani 800, 1913).

## Explanation

In *Peru mottu vatham* (OA knee) swelling occurs in both knees. There is difficulty in extending and bending the leg. There is a lot of stiffness, pain, and fatigue in the knee. The knee will swell and feel like it is being pricked by a needle. There is also pain. Occasionally there is also coldness, fatigue, body aches, lethargy, numbness in legs, weight loss, and insomnia. Drowsiness occurs.

## Etiology of Azhal keel vaayu

### Uyir thathukal (bioenergetic principle-the life forces)

The human body's vital components are *Uyir thathukal* (*Vatham*, *Pitham*, and *Kabham*). The *Pitham* is more common in the abdomen and thorax, the *Kabam* is more common above the neck, and the *Vatham* is more common below the umbilicus (Figures 1-6).

## Bio-Energy Movement or Vatham

*Vatham* represents the elements (*Panchabootham*) air and space expressing the humours/principles of the body's functional constitution. The body's primary kinetic energy, *Vatham*, is responsible for both motor and sensory functions. *Vatham* is primarily found in the area under the umbilicus and is divided into ten categories according to its function. *Pranan*, *Abanan*, *Viyanan*, *Samanan*, *Udhanan*, *Naagan*, *Koorman*, *Kirugaran*, *Devathathan*, and *Thananjeyan* are their names. Some characteristics of *Vatham* are its roughness, dryness, lightness, and movement.

### Abanan (Keelnokkukaal-Downward energy)

Component of *Vatham* responsible for all downward/caudal movements in the body, such as peristalsis. Responsible for absorption and assimilation of the essence, excretion of urine and feces, ejection of semen, and expulsion of contents of the uterus, contracts and relaxes the sphincters.

### Viyanan (Paravukaal-Centrifugal energy)

Component of *Vatham* that disseminates all over the body through 72,000 vessels and nerves, causing voluntary and involuntary functions. It takes the nutrients to all parts of the body.

## Pitham (Bio-Energy Fire)

One of the three humors/principles of the functional constitution of the body represents the element fire. *Pitham* is the principle of transformation energy and governs heat and metabolism in the body and is concerned with the digestive, enzymatic, and endocrine systems. It dominates the chest and abdominal area and exhibits itself in five forms. They are *Anarpitham*, *Ranjaga pitham*, *Saathaga pitham*, *Aalosaga pitham* and *Prasaga pitham*. It is eliminated from the body through sweat.

### Saathagam pitham (Aatralanki-life energy)

This fire is responsible for higher intellectual functions. It activates the body, mind, and intellect.

### Kabam (Bio-Energy Water)

One of the three humors/principles of the functional constitution of the body represents the elements water and earth. *Kabam* is the principle of stabilizing energy and governs growth in the body and mind and is concerned with structure, stability, lubrication, and fluid balance. It dominates the head and neck region and exhibits itself in five forms. They are *Avalambagam*, *Kilaetham*, *Pothagam*, *Tharpagam* and *Santhigam*. It is eliminated from the body through the urine:

- Santhigam (*Onri Iyam*-Synovial fluid).
- Sustaining in the joints makes them move freely and easily.

The above flowchart briefly describes the relationship between the three humors. The derangement of any two or all three humors results in OA.

### ENVAGAI THERVU (EIGHT-FOLD SYSTEM OF CLINICAL ASSESSMENT IN TSM)

As per Siddha literature, Envagai Thervu are classified into:

- Naadi (Unique Siddha pulse reading method),
- Sparisam (Examination of Touch / palpation),
- Naa (Examination of Tongue),
- Niram (Examination of Colour/ Complexion),
- Mozhi (Examination of Speech),
- Vizhi (Examination of Eye),
- Malam (Examination of Stool),

- Moothiram,
- Neerkuri (Urine examination),
- Neikuri (Urine Sign-Oil Drop Test).

### NEIKURI (Urine Sign-Oil Drop Test)

A unique Siddha diagnostic procedure in which a drop of gingelly oil is dripped onto the surface of the patient's urine collected in a bowl made of glass or porcelain under sunlight, and its mode of spread is observed without any external disturbances.

Aruntumārīratamum avirōtamātāy

aḥkal alartal akālavūṇa tavarntaḷar

kurṛaḷavarunti uṛaṅki vaikaṛai

āṭikkalacat tāviyē kātu pey

torumukūrttak kalaikkutṭaṭu niriṇ

niṛakkurī neykkurī nirumittal kaṇaṇē

(*Theran Neerkuri vaithiyam neerkuri nool-neikuri nool moolamum uraiyum*, 2021).

### Explanation

It is proper to eat and sleep in a way that does not cause any harm to the taste buds, such as increasing or decreasing the amount of food consumed, and to observe the color of water in a vessel before dawn, and to add oil to it, and to observe the visible signs, and to ascertain the signs of cure and non-cure of diseases

It is a cost-effective and non-invasive method that can be used as a diagnostic tool to assess the prognosis. Like the Kellgren and Lawrence (radiological) classification, Neikuri is used to express the severity of the disease and as a prognosis tool in the TSM. *Neikuri* plays a major role in the prognosis of the categorical variables, which are represented by frequency and percentage (Diagrams 1-3). The analysis of *Neikuri* involves dispersal time



Figure 1: Showing the pathogenesis of Azhal keel vayu.

**Table 1: Showing Neikuri of patients diagnosed as Azhal keelvayu.**

| Sl. No. | Op.No | Age/Sex | Neikuri at 5 min                                   | Neikuri at 40 min                           | Impression               |
|---------|-------|---------|----------------------------------------------------|---------------------------------------------|--------------------------|
| 1.      | 7533  | 46/F    | Slow spread slow-Regular circle                    | Fast spread-Triangular                      | <i>Pitha vatham</i> [PV] |
| 2.      | 4824  | 58/F    | Fast spread-Snake shape                            | Fast spread-Regular circle                  | <i>Vatha pitham</i> [VP] |
| 3.      | 6547  | 57/M    | Slow spread-regular circle with one side elongated | Same                                        | Vatham                   |
| 4.      | 4160  | 60/F    | Fast spread-Irregular circle                       | Fast spread-Regular circle                  | <i>Vatha pitham</i> [VP] |
| 5.      | 4950  | 65/F    | Fast spread-Regular circle                         | Slow spread-Irregular circle                | <i>Pithavatham</i> [PV]  |
| 6.      | 3650  | 70/M    | Fast spread-Irregular circle                       | Fast spread-Many Snake-like Shape           | Vatham                   |
| 7.      | 5207  | 45/F    | Slow spread-Regular circle                         | Slow spread-Regular circle                  | Pitham                   |
| 8.      | 5210  | 54/F    | Fast spread-Regular circle                         | Fast spread-Irregular circle                | <i>Pithavatham</i> [PV]  |
| 9.      | 2846  | 66/M    | Slow spread-pearl shape                            | Slow spread-Regular circle                  | Kapapiththam[KP]         |
| 10.     | 2850  | 65/M    | Slow spread-Pearl shape                            | Slow spread-Regular circle                  | <i>Kapapiththam</i> [KP] |
| 11.     | 6101  | 66/M    | Slow spread-Regular circle                         | Fast spread-Triangular shape                | <i>Pithavatham</i> [PV]  |
| 12.     | 6100  | 40/F    | Slow spread-Pearl shape                            | No spread-Pearl shape                       | Kabham                   |
| 13.     | 7705  | 60/F    | Slow spread-Pearl shape                            | No spread-Pearl shape                       | Kabham                   |
| 14.     | 7750  | 62/M    | Slow spread-Regular circle                         | Slow spread-Regular circle                  | Pitham                   |
| 15.     | 1393  | 56/M    | Fast spread-Irregular circle                       | Fast spread-Irregular circle                | Vatham                   |
| 16.     | 9299  | 58/F    | Fast spread-Regular circle                         | Fast spread-Irregular circle                | <i>Pithavatham</i> [PV]  |
| 17.     | 9116  | 65/M    | Fast spread-Regular circle                         | Slow spread-Irregular circle                | <i>Pithavatham</i> [PV]  |
| 18.     | 489   | 65/M    | Slow spread-Pearl shape                            | Slow spread-Regular circle                  | <i>Kabhapitham</i> [KP]  |
| 19.     | 2689  | 58/M    | Slow spread-Pearl shape                            | Slow spread-Pearl shape                     | Kabham                   |
| 20.     | 3508  | 46/F    | Slow spread-Pearl shape                            | Slow spread-Pearl shape                     | Kabham                   |
| 21.     | 3539  | 68/M    | Fast spread-Star like shape                        | Fast spread-Dumble like shape               | Vaatham                  |
| 22.     | 3522  | 50/F    | Fast spread-Irregular circle                       | Slow spread-Snake-like shape                | Vaatham                  |
| 23.     | 3552  | 40/F    | Fast spread-Regular circle                         | Fast spread-Irregular circle                | <i>Pithavatham</i> [PV]  |
| 24.     | 5791  | 27/F    | Slow spread-Pearl shape                            | Slow spread-Pearl shape                     | Kabham                   |
| 25.     | 4621  | 62/F    | Slow spread-Pearl shape                            | Slow spread-Pearl shape                     | Kabham                   |
| 26.     | 8632  | 45/F    | Slow spread-Pearl shape                            | Slow spread-Regular circle                  | Kabhapitham [KP]         |
| 27.     | 7696  | 56/F    | Slow spread-Pearl shape                            | Slow spread-Regular circle                  | Kabhapitham [KP]         |
| 28.     | 7887  | 57/M    | Slow spread-Regular circle                         | Slow spread-Irregular circle                | <i>Pithavatham</i> [PV]  |
| 29.     | 5791  | 27/M    | Slow spread-Pearl shape                            | Slow spread-Regular circle                  | <i>Kabhapitham</i> [KP]  |
| 30.     | 8747  | 56/M    | Fast spread-Triangular shape                       | Fast spread-Triangular shape                | Vatham                   |
| 31.     | 3510  | 42/M    | Fast spread-Irregular circle                       | Fast spread-Anchor like shape               | Vatham                   |
| 32.     | 8640  | 54/M    | Fast spread-Regular circle                         | Fast spread-Irregular circle                | <i>Pithavatham</i> [PV]  |
| 33.     | 9226  | 62/M    | Fast spread-Like Snake shape                       | Slow spread-Regular circle                  | Vathapitham [VP]         |
| 34.     | 9796  | 49/M    | Fast spread-Like Snake shape                       | Slow spread-Snake shape with regular circle | <i>Vathapitham</i> [VP]  |
| 35.     | 9724  | 67/M    | Slow spread-Regular circle                         | Slow spread-Regular circle                  | Pitham                   |
| 36.     | 1503  | 48/M    | Fast spread-Irregular circle                       | Slow spread-Seive like pattern              | Kabham                   |
| 37.     | 3905  | 42/F    | Fast spread-Snake like shape                       | Fast spread-Seive like pattern              | Kabham                   |
| 38.     | 5673  | 69/F    | Slow spread-Regular circle                         | Slow spread-Pearl shape                     | <i>Pithakabham</i> [PK]  |

| Sl. No. | Op.No | Age/Sex | Neikuri at 5 min             | Neikuri at 40 min              | Impression                |
|---------|-------|---------|------------------------------|--------------------------------|---------------------------|
| 39.     | 2546  | 31/F    | Slow spread-Regular circle   | Slow spread-Seive like pattern | Kabham                    |
| 40.     | 2689  | 73/F    | Slowly spread-Regular circle | Slowly spread-Pearl shape      | <i>Pithakabham</i> [PK]   |
| 41.     | 9655  | 47/M    | Slow spread-Like Snake shape | Slow spread-Irregular circle   | Vatham                    |
| 42.     | 6805  | 52/F    | Fast spread-Irregular circle | Fast spread-Irregular circle   | Vatham                    |
| 43.     | 6134  | 53/F    | Slow spread-Pearl shape      | Slow spread-Regular circle     | <i>Kabhapiththam</i> [KP] |
| 44.     | 7408  | 59/M    | Slow spread-Like Snake shape | Slow spread-Triangular shape   | Vatham                    |
| 45.     | 2367  | 65/M    | Fast spread-Regular circle   | Fast spread-Irregular circles  | <i>Pithavatham</i> [PV]   |
| 46.     | 4847  | 58/F    | Fast spread-Irregular circle | Fast spread-Regular circle     | <i>Vathapitham</i> [VP]   |
| 47.     | 885   | 60/M    | Slow spread-Irregular circle | Slow spread-Irregular circle   | Vatham                    |
| 48.     | 3311  | 39/M    | Slow spread-Pearl shape      | Slow spread-Pearl shape        | Kabham                    |
| 49.     | 5038  | 32/F    | Fast spread-Irregular circle | Slow spread-Irregular circle   | Vatham                    |
| 50.     | 7661  | 47/F    | Fast spread-Irregular circle | Fast spread-Irregular circle   | Vatham                    |



**Figure 2:** Showing Vatham Neikuri pattern.



**Figure 3:** Showing Pitham Neikuri pattern.

and nature, which are keen significant between the three types of *Kuttram*.

## MATERIALS AND METHODS

### Neikuri

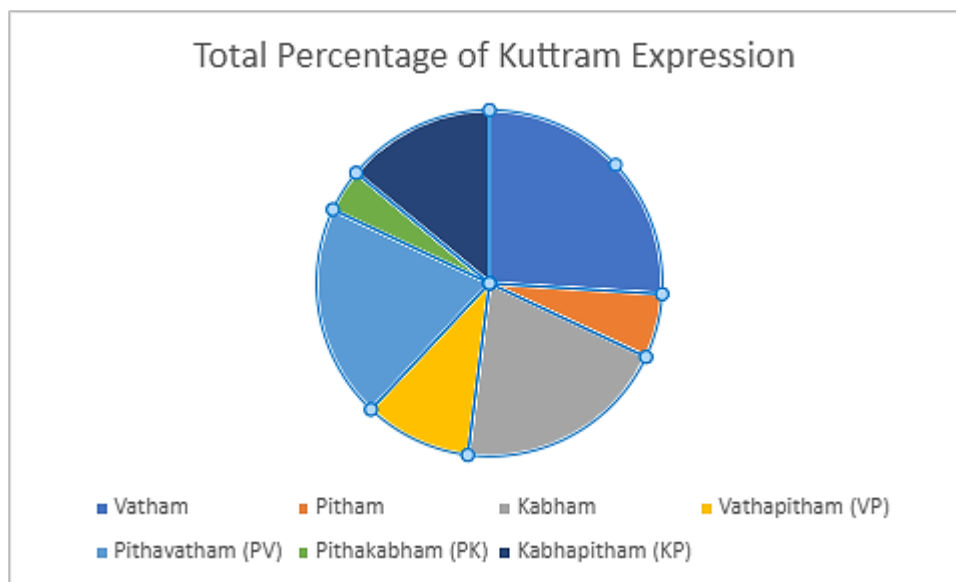
50 newly diagnosed *Azhal keelvayu* (Osteoarthritis) patients confirmed by symptoms and X-ray investigation, 25 males, 25 females attending Government Siddha Medical College and Hospital, Chennai, were observed using the *Neikuri* method for prognosis.

50 mL of collected urine from each patient was transferred into a black glass bowl (black glass bowls provide better imaging than

glass bowls) and kept on a flat surface without disturbing it for 5 min in order to settle down. After 5 min, a drop of gingelly oil was dropped at the center over the surface of urine in the bowl using a dropper at a 3-4 cm height from the urine surface without disturbing the surface. The pattern of oil spread was keenly observed under sunlight at 0 and 40 min over the surface of urine. The observations were recorded diagrammatically, and inferences were noted.

### Data analysis

Shape of the Oil Drop and its Inference:



**Diagram 1:** Showing total percentage of Kuttram expression.



**Figure 4:** Showing Kabham Neikuri pattern.



**Figure 4a:** Showing Salladai kan pattern of Kabham.

- *Vatham* pattern-Oil drops take the shape of a snake; it indicates *Vatham* humor.
- *Pitham* pattern-spreads like a Regular circle; it indicates *Pitham* humor.
- *Kabham* pattern-Oil drops stand like a pearl; it indicates *Kabham* humor. These spread patterns indicates a normal physiological state.
- Combined pattern-There is a combined shape like a Regular circle in a snake or snake in the Regular circle, a snake and a pearl, or a pearl in the Regular circle, it indicates combined derangement of humors.
- If the oil drop takes the shape of a sieve, it suggests *Kabham* diseases and requires immediate treatment.

## RESULTS AND DISCUSSION

### Observed Neikuri pattern

#### Data interpretation

The data includes an observational study of *Kuttram* expression in 50 patients (Table 1), divided into 25 males and 25 females. The study classifies the subjects according to the expression of primary and secondary *Kuttram*, i.e., *Vatham*, *Pitham*, *Kabham*, *Vathapitham* (VP), *Pithavatham* (PV), *Pithakabham* (PK),

*Kabhapitham* (KP), and *Salladai kan* (which can be classified under *Kabham*).

## Gender-Specific Kuttram Expression

### Male Patients (n=25)

- **Dominant Expression:** The most dominant *Kuttram* expression in males is *Vatham*, which is observed in 9 out of 25 male patients.
- **Secondary Expressions:** The second most dominant expression is *Pithavatham* (PV), which is observed in 5 male patients, followed by 4 male patients showing *Kabhapitham* (KP).



Figure 5: Showing Vatham Neikuri pattern.

- **Lower Frequencies:** *Pitham*, *Kabham*, and *Vathapitham* (VP) are observed in 2 male patients each.

- **Notable Absence:** *Pithakabham* (PK) is totally absent in male patients, i.e., 0 male patients are showing *Pithakabham*.

### Female Patients (n=25)

- **Dominant Expression:** The most dominant *Kuttram* expression in females is shared by two types, i.e., *Kabham* and *Pithavatham* (PV), which are observed in 5 female patients each.



Figure 6: Showing Pithavatham Neikuri pattern.

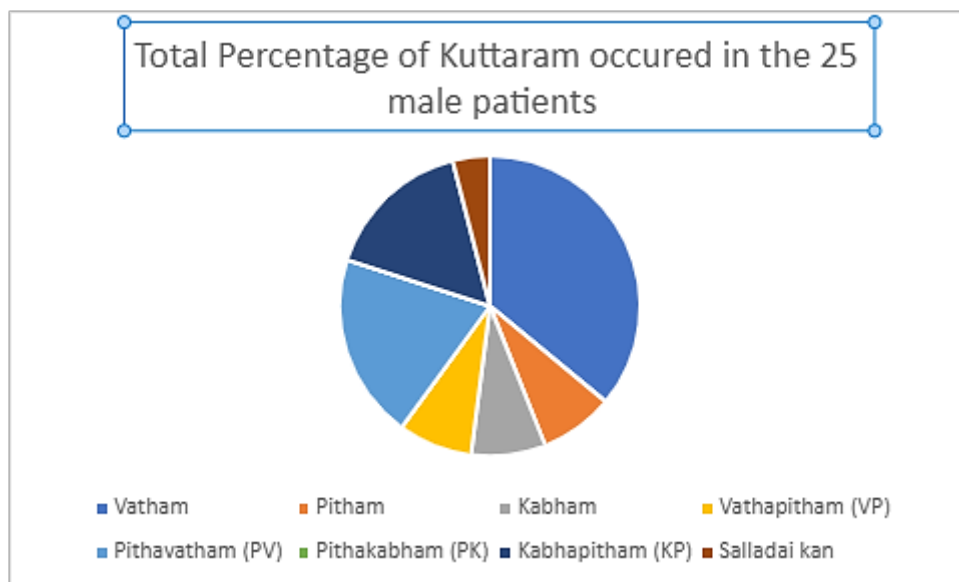
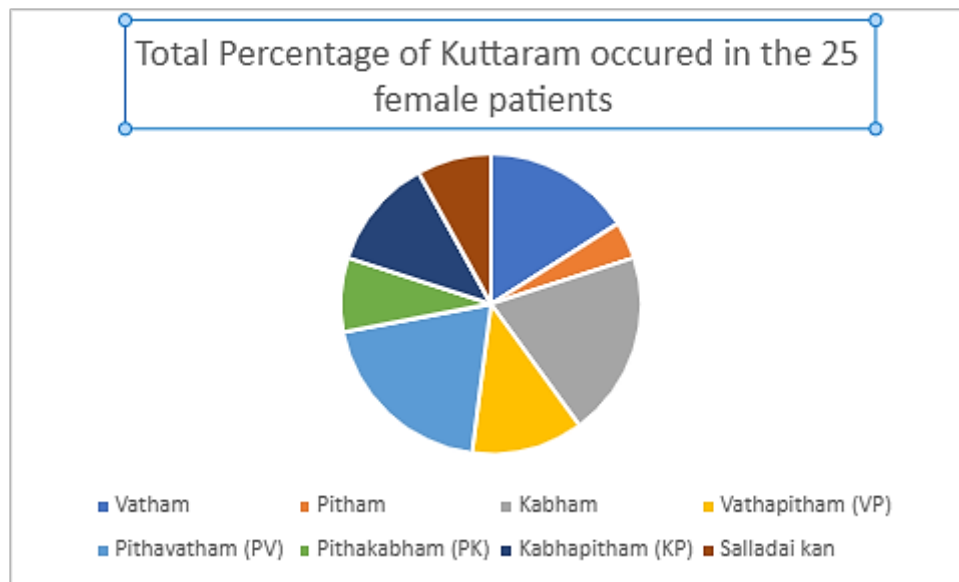
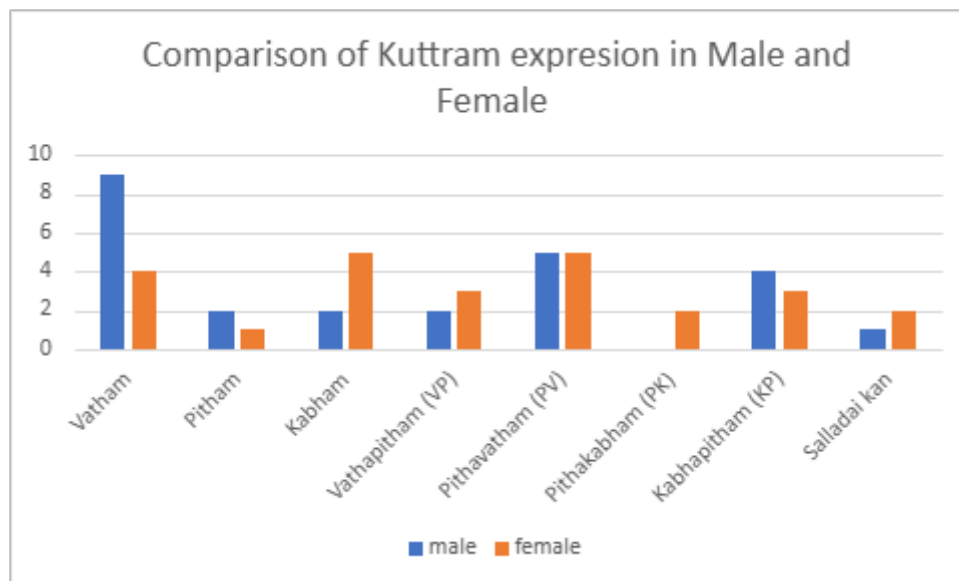


Diagram 2: Total percentage of Kuttaram occurred in 25 male patients.



**Diagram 3:** Total percentage of Kuttram occurred in 25 female patients.



**Graph 1:** Comparison of Kuttram expression in Male and Female.

- **Secondary Expressions:** *Vatham* is the second most dominant expression in females, observed in 4 female patients. *Vathapitham* (VP) and *Kabhapitham* (KP) are observed in 3 female patients each (Graphs 1).
- **Lower Frequencies:** *Pithakabham* (PK), *Salladai kan*, and *Pitham* are observed in 2 and 1 female patients, respectively.

### Comparative Analysis (Male vs. Female)

From the comparative bar chart, it is evident that there are some critical differences in the expressions of *Kuttram* in males and females:

- **Vatham Disparity:** The isolated expression of *Kuttram*, *Vatham* shows a sharp difference in the number of

patients, with more than twice as many males expressing this *Kuttram* compared to females.

- **Kabham Divergence:** The isolated *Kuttram* expression of *Kabham* shows a sharp divergence between the genders, with more females expressing this *Kuttram* compared to males.
- **Absence vs. Presence:** *Pithakabham* (PK) shows a critical difference in *Kuttram* expression in the context of gender, with this *Kuttram* not being expressed in males at all and being expressed in 2 females.
- **Points of Equivalence:** Despite the differences in the individual *Kuttram* expressions, *Pithavatham*, *Kuttram* are expressed in exactly 5 males and 5 females.

Three out of ten *Kabham* patterns showed sieve shape (*Salladai kan*); this indicated that the patient with this pattern needed immediate treatment. From the *Kuttram* that we interpret by observing the oil drop pattern, we conclude which *Kuttram* has triggered the disease. The progress of the disease can be assessed by the difference in the pattern of oil drops and aids in deciding the subsequent treatment regimen from the previous oil drop pattern. No change in the pattern indicates no progress in the treatment regimen.

### Shortfall in using *Neikuri*

A patient showing a sieve pattern, which requires immediate treatment, may not just talk about the status of *Azhal keel vayu* but also about the underlying chronic illness, so a history must be taken while using *Neikuri* as a tool for prognosis. Clinical progress for the *Azhal keel vayu* can be achieved, but the *Neikuri* pattern may still show no progress.

### CONCLUSION

From the data, it is evident that *Kuttram* humoral expressions have a critical gender correlation. The data shows that males in this population have a greater predisposition to *Kuttram* expressions of *Vatham*, and females have a greater predisposition to *Kuttram* expressions of *Kabham* and *Pithavatham*.

*Neikuri* is a useful non-invasive tool for progression, with its own shortcomings of having one diagnosed disease in combination with an underlying chronic disease that is undiagnosed. But it's a seriously useful tool for identifying the primary humor that has been deranged. It has more importance in pediatric cases.

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### ABBREVIATIONS

TSM: Traditional Siddha system of Medicine; ROM: Range of motion; JSN: Joint space narrowing; OA: Osteoarthritis; CT: Computerized tomography; MRI: Magnetic resonance imaging; PV: Pithavatham; VP: Vathapitham; KP: Kabhapitham; PK: Pithakabham.

### CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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