

A Cross-Sectional Study for Validation of *Enjal Ilakkanam* in Paandu Noi

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ABSTRACT

Siddha system is one of the oldest systems of Medicine which is an evolution of daily lifestyle, thereby preventing major diseases by correcting day to day life activities. To diagnose a disease, Siddhars investigate the cause of the disease with the approach to the disease called *Noi naadal* and determination of etiology of the disease called *Noi mudhal naadal*. It has many unique diagnostic tools and *ennvagai thervu* is one among them. Out of these eight entities, methods used for physical examination of urine (*Neerkuri* and *Neikkuri*) and pulse are unique to Siddha and act as confirmatory diagnostic tools. Anemia refers to a state in which the level of hemoglobin in the blood is below the reference range appropriate for age and sex. It is now a serious global public health problem. To validate *enjal ilakkanam* in Paandu Noi with blood investigation of hemoglobin. Their urination history was noted through history taking and by measuring one's 24 hours urine through U-flow meter or measuring jar with the advice of 3-4 liters of water intake per day and then their blood samples were sent for Hemoglobin investigation. This study showed relationship between range of hemoglobin and level of hypouresis. It showed that urine volume is directly proportional to hemoglobin value. This study will help to diagnose anemia priorly, through *enjal neerkuri* before blood investigation.

This study also justifies “Paandu Noi *enjal ilakkanam*”.

Keywords: *Enjal ilakkanam*, anemia, hypouresis, diagnosis

INTRODUCTION

Siddha system is one of the oldest systems of Medicine which is an evolution of daily lifestyle, thereby preventing major diseases by correcting day to day life activities. Siddhars have recommended certain basic guidelines to be followed for healthy living like *Pini anugaa vidhi*, *Thinai/Nilam*, *Naal ozhukkam*, *Kaala ozhukkam*, *Unavu*. Among them, *Naal Ozhukkam* mentions the systematic order of everyday activities that every person needs to follow to avoid lifestyle disorders and related diseases [1].

“*Mummalam Aruneer* [2]”

It is normal to pass faeces thrice a day and urine six times a day which when disturbed indicates abnormal bowel function. One should not suppress these two physiological reflex activities. Proper excretion indicates proper digestion and helps the three humours or *uyir thathukkal* to stay in equilibrium.

To diagnose a disease, Siddhars investigate the cause of the disease, the signs and symptoms, complications if any, and pathological tissue (*udal kooru*) changes. They examine both the body and the disease together to arrive at a conclusion regarding the condition or disease [1]. Essentially, the Siddha system follows a unique methodology in diagnosis of disease. It

consists of eight criteria for physical examination and is called 'Ennvagai thervu'. These include:

"Naadisparisam naaniram mozhivizhi malam moothiramivai maruthuvaraayudham [3]"

Out of these eight entities, methods used for physical examination of urine (*Neerkuri* and *Neikkuri*) and pulse are unique to Siddha and act as confirmatory diagnostic tools [1], in which *neerkuri* includes *niram*, *yedai*, *naatram*, *nurai* and *enjal* (*kuraidhal*). Anemia refers to a state in which the level of hemoglobin in the blood is below the reference range appropriate for age and sex [4]. At first, anemia can be so mild that it won't be noticed. But symptoms worsen as anemia worsens. Anemia is now a serious global public health problem and it is associated with poor cognitive and motor development in children and work capacity in adults, influence country's economic development [5]. Also, it is an indicator of both poor nutrition and poor health [6]. Prevalence in women: 29.9% [5]. Failure to reduce anemia may result in millions of women experiencing impaired health and quality of life and may impair children's development and learning [7]. According to the World Health Organization (WHO), anemia is defined as hemoglobin (Hb) levels <12.0 g/dL in women and <13.0 g/dL in men [8].

LITERATURE REVIEW

Paandu noi urpathiyai kaatum neerin enjal ilakkanam

"Iyarkkai neer surunginum idhuvum salapporul

Seyarkkai yaayarundhinum siruttha neeridhuvum

Paandu noi sambavatthai tharumidhil Thoonduraa bedhium sorvum pirakkume [9]"

When the normal urine output is reduced without any underlying cause, on even intake of liquid food, it paves the way for anemia. It is followed by diarrhoea and tiredness.

Thus, this study is to validate enjal ilakkanam in Paandu Noi with blood investigation of

hemoglobin and to legitimate relationship between range of hemoglobin and level of hypouresis.

MATERIALS AND METHODS

Ethical Matters

The study had obtained IEC clearance (IEC No. GSMC-CH-3466/ME-2/037/2022) and got registered in CTRI (CTRI No. CTRI/2022/11/047311).

Study Design & Setting

This was a cross-sectional study carried out in OPD of Government Siddha Medical College attached with Arignar Anna Government Hospital of Indian Medicine and Homoeopathy, Arumbakkam, Chennai-106 for a period of three months.

Sampling techniques and Sample size

50 participants were selected by random sampling method based on inclusion and exclusion criteria and were subjected to the study.

Inclusion criteria

The cases in the age of 15-65 years in all genders with hypouresis history (less than 1L/day) at present (or) known anemic cases who had previous history of hypouresis were included for the study.

Exclusion criteria

Patients with UTI, renal insufficiency, BPH, renal calculi and those who had refused for blood investigation, 24 hours urine collection were excluded from the study. And finally, unwilling participants were also excluded from the study.

Study enrollment

The enrollment of patients was based on inclusion and exclusion criteria. The patients were informed about the study and consent was obtained from all the patients.

Study procedure

Their urination history was noted through history taking and by measuring one's 24 hours urine through U-flow meter or

measuring jar with the advice of 3-4 liters of water intake per day. And then their blood samples were sent for Hemoglobin investigation.

STATISTICAL ANALYSIS

Data were collected from data collection form and from the blood investigation and the obtained data were analyzed using MS Excel.

**RESULT
DISTRIBUTION BASED ON GENDER**

GENDER	NO. OF PARTICIPANTS
Male	10
Female	40
Total	50

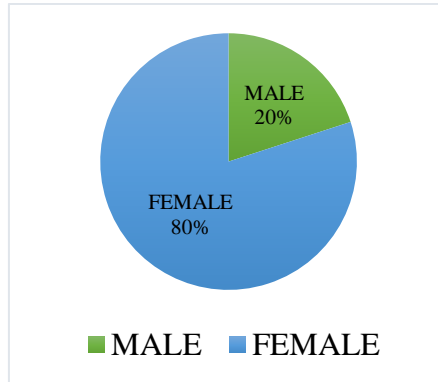


Figure 1. Distribution based on gender

DISTRIBUTION BASED ON AGE GROUP

AGE GROUP	MALE	FEMALE	TOTAL
15-25	8	27	35
25-35	-	3	3
35-45	-	3	3
45-55	2	4	6
55-65	-	3	3
Total	10	40	50

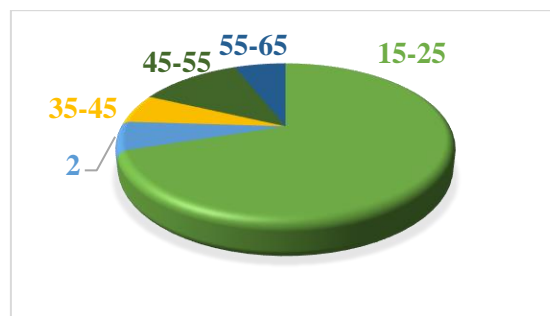
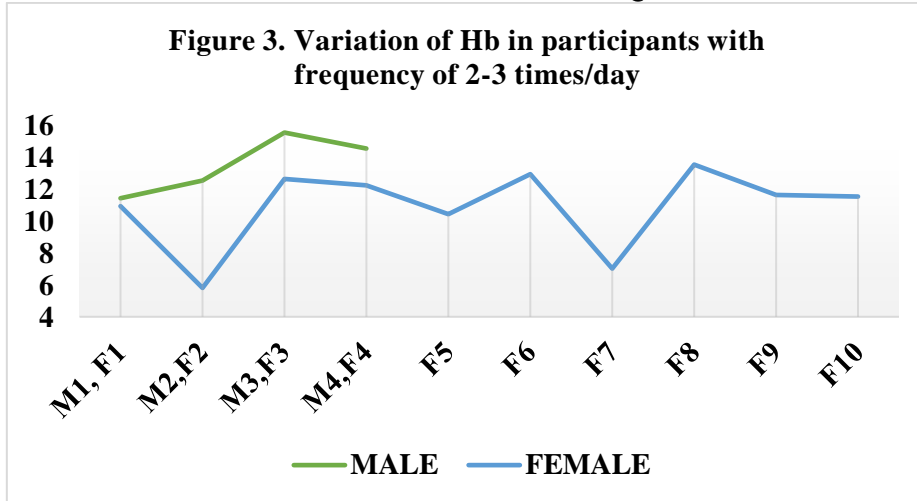


Figure 2. Distribution based on age group

DISTRIBUTION OF PARTICIPANTS BASED ON FREQUENCY OF URINATION

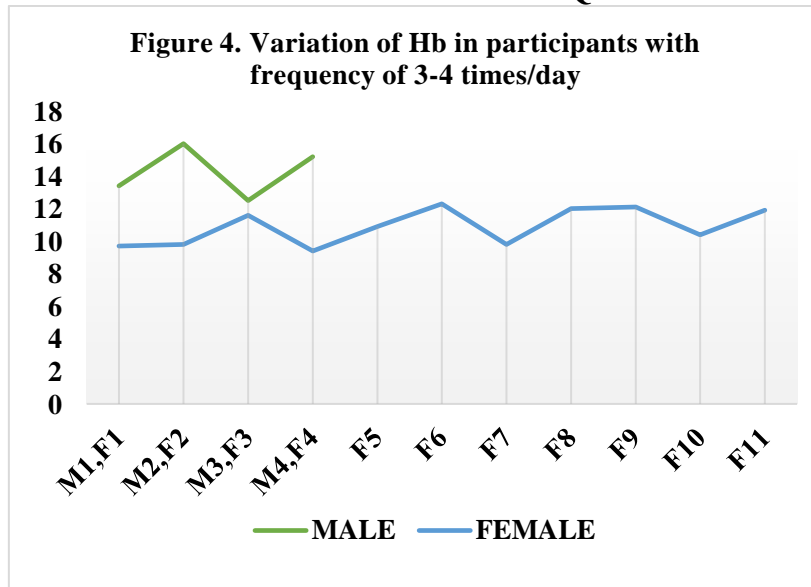
URINE FREQUENCY	MALE	FEMALE	TOTAL
2-3	4	10	14
3-4	4	11	15
4-5	1	13	14
5-6	1	2	3
6-7	-	4	4
Total	10	40	50

VARIATION OF Hb IN PARTICIPANTS WITH FREQUENCY OF 2-3 TIMES/DAY



MALE	FEMALE
11.4	10.9
12.5	5.8
15.5	12.6
14.5	12.2
	10.4
	12.9
	7
	13.5
	11.6
	11.5
MEAN = 13.5	10.8

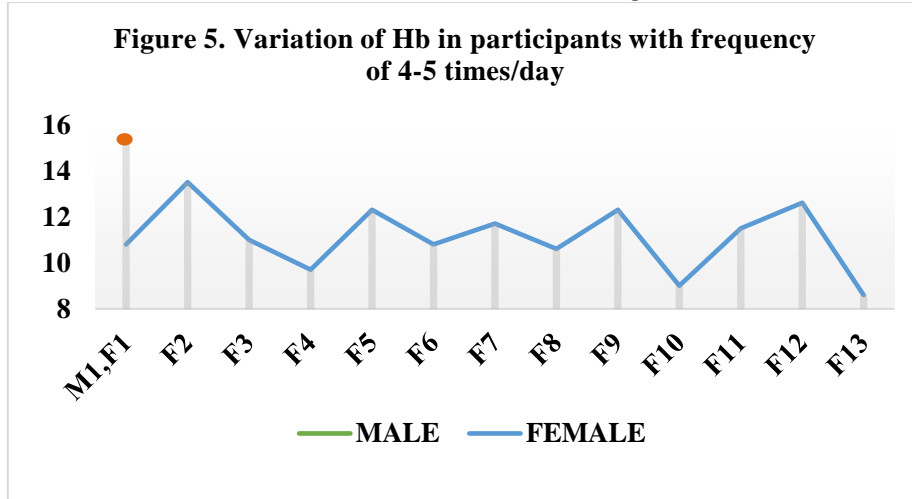
VARIATION OF Hb IN PARTICIPANTS WITH FREQUENCY OF 3-4 TIMES/DAY



MALE	FEMALE
13.4	9.7
16	9.8
12.5	11.6
15.2	9.4
	10.9

	12.3
	9.8
	12
	12.1
	10.4
	11.9
14.3	10.9

VARIATION OF Hb IN PARTICIPANTS WITH FREQUENCY OF 4-5 TIMES/DAY



MALE	FEMALE
15.3	10.8
	13.5
	11
	9.7
	12.3
	10.8
	11.7
	10.6
	12.3
	9
	11.5
	12.6
	8.6
15.3	11.1

VARIATION OF Hb IN PARTICIPANTS WITH FREQUENCY OF 5-6 TIMES/DAY

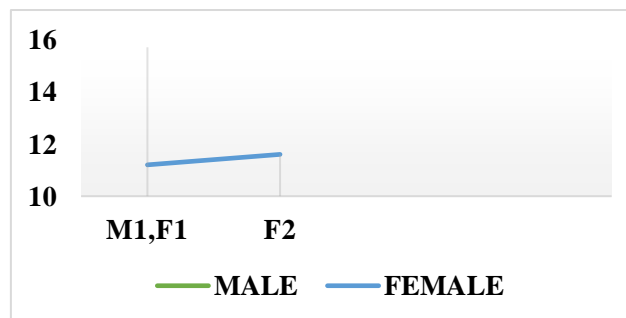


Figure 6. Variation of Hb in participants with frequency of 5-6 times/day

MALE	FEMALE
15.7	11.2
	11.6
15.7	11.4

VARIATION OF Hb IN PARTICIPANTS WITH FREQUENCY OF 6-7 TIMES/DAY

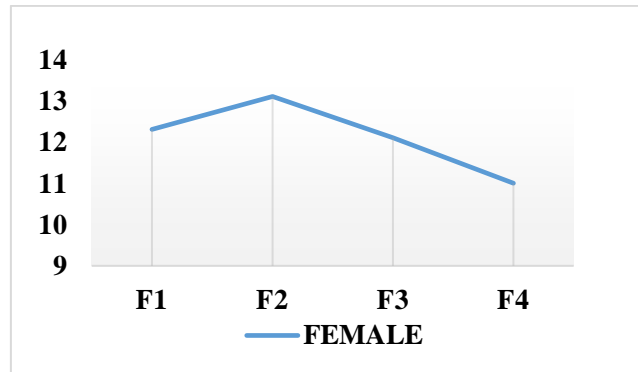
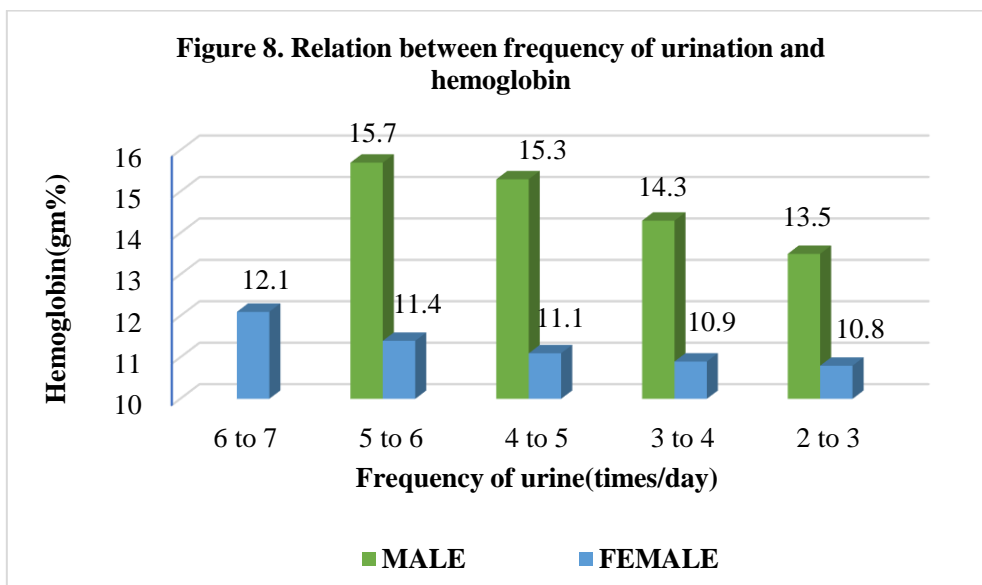


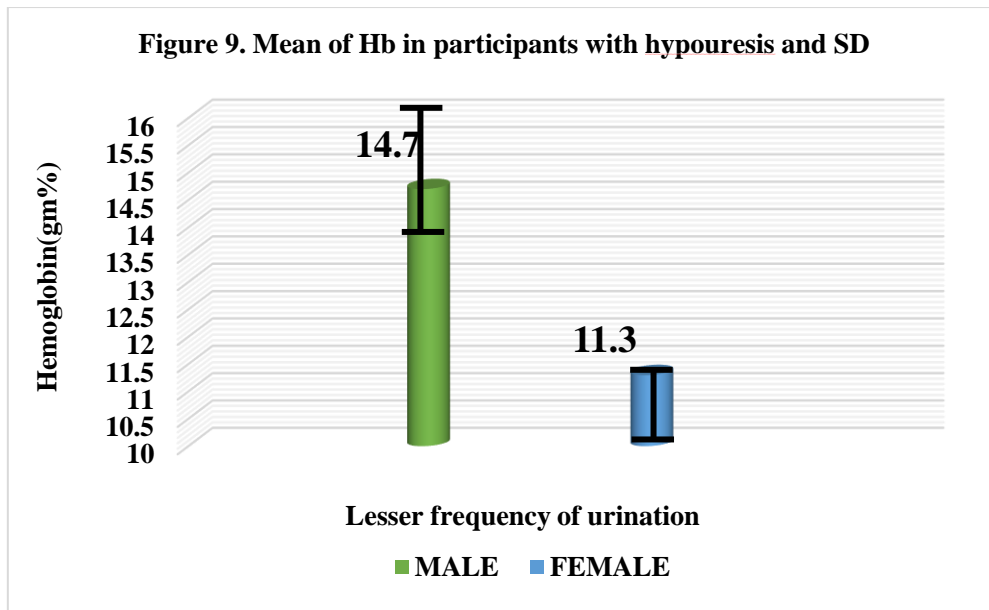
Figure 7. Variation of Hb in participants with frequency of 6-7 times/day

FEMALE
12.3
13.1
12.1
11
12.1

RELATIONSHIP BETWEEN HYPOURESIS AND ANEMIA

FREQUENCY OF URINATION (times/day) & VOLUME (ml/day)		HEMOGLOBIN (gm%)	
		MALE	FEMALE
6-7	1200-1500	-	12.1 ± 0.4
5-6	1000-1200	15.7 ± 0.57	11.4 ± 0.05
4-5	800-1000	15.3 ± 0.35	11.1 ± 0.1
3-4	600-800	14.3 ± 0.23	10.9 ± 0.2
2-3	400-600	13.5 ± 0.69	10.8 ± 0.25
MEAN		14.7 ± 0.86	11.3 ± 0.46



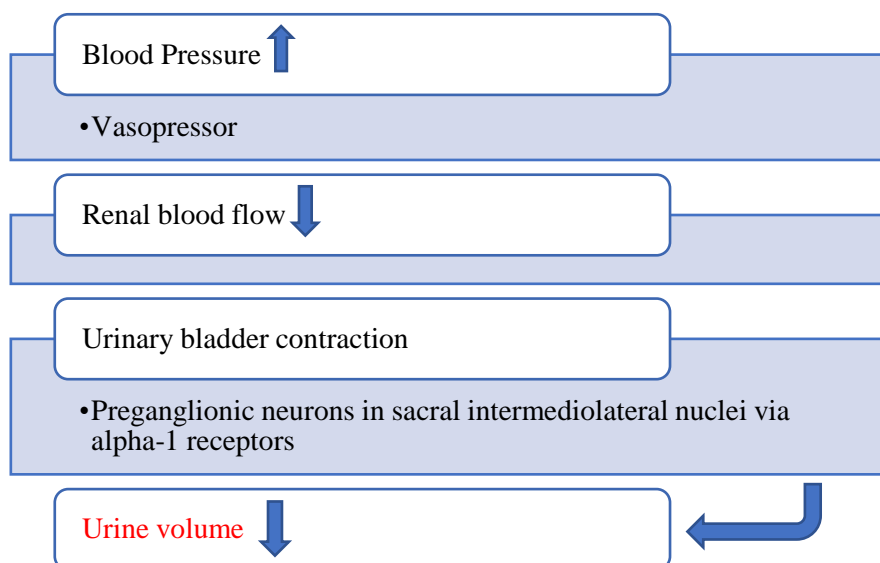


DISCUSSION

Evaluation for anemia is one of the most common problems in clinical practice. The evaluation may be straightforward in an otherwise healthy individual with a single cause of anemia, but in many cases the cause is not readily apparent and conditions may be contributing [10]. There are many diagnostic methods like blood tests, bone marrow test and others like colonoscopy, endoscopy, genetic tests, urine tests available for interpretation of anemia [11].

Also, there were many studies done in the Siddha diagnostic field of anemia like naadi, neikkuri, manikkadai nool. But this is a novel and unique approach for the evaluation of anemia which is presented here. It has the following merits like cost-effectiveness, eco-friendly, painless, harmless, non-clinical, non-invasive and self-diagnostic. Thus, this unique Siddha diagnostic method can be used for interpreting anemia in earlier events.

Mechanism of study with Norepinephrine



Norepinephrine is a sympathomimetic used in the control of blood pressure during various hypotensive states and as an adjunct treatment during cardiac arrest. The nervous system releases this chemical norepinephrine, which tightens blood vessels and keeps blood pressure in check. It is the precursor of epinephrine that is secreted by the adrenal medulla and is a widespread central and autonomic neurotransmitter. It is said that epinephrine and norepinephrine affect urine formation in two ways: first, by increasing the arterial pressure which indirectly increases urinary output and second, by acting directly on the kidney to decrease the output [12].

Thus, this study shows the significant role of urination in case of anemia. Also, this exhibits relationship between range of hemoglobin and level of hypouresis. It shows that urine output is directly proportional to hemoglobin value.

Urine output & Hemoglobin

The level of hemoglobin varies with frequency and volume of urination. Lower the urine output, low is the hemoglobin value and vice versa. i.e., the participants with reduced urine output (hypouresis) were found to be anemic. Of the total population, 40 were females and only 10 were males which shows that anemia is more common in women than men.

CONCLUSION

This study helped to diagnose anemia priorly, through enjal neerkuri before blood investigation. This study also justifies "Paandu Noi enjal ilakkanam". So, with this simple lifestyle note on hypouresis (enjal neerkuri), which can be a premonitory symptom, early diagnosis of anemia will be possible. This will be futuristically significant by preventing women from anemia and giving rise to healthy upcoming generation. This will also help poor and illiterate and thus, may lead to healthy nutritive environment.

LIMITATIONS

As the number of male participants in the study population was lower than the female, there occurred difference in study results. There were only 10 male participants in the whole study population for all 5 categories. Therefore, if the sample size of male participants is large, positive result may be obtained. Also, this alone cannot be used for confirming the diagnosis. It would be rather useful in writer prediction of anemia. In future, this study will be proceeded further for correlation with type of anemia and will be conducted with larger male population.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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