

DETERMINATION OF THE POSSIBLE ASSOCIATION BETWEEN SPECIFIC UDAL IYAL (BODY CONSTITUTION) WITH PAANDU (ANAEMIA) – AN OBSERVATIONAL CLINICAL STUDY

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ABSTRACT

Introduction: Anaemia is a serious global public health problem that particularly affects young children, women and pregnant women. According World Health Organisation the prevalence of Anaemia worldwide is 25%. In siddha concept, every individual was born with their own basic body constitution termed as *Dhegi (Vatham, Pitham, Kabam & Thondham)*. The characters of an individual depend upon their *Dhega Ilakanam (Udal Iyal)*. In *Vaithiya chindhamani (Sikisha Ratna Deepam)* some of the specific pattern of diseases is more prone to specific *Dhegies*. *Dhegi* examination is helpful for a particular individual thereby changing the lifestyle and dietary regimen and to live a healthy and peaceful life. The purpose of this study is to explore the possible association between the specific *Udal Iyal* with *Paandu*. So, the treatment strategies can be accordingly decided with respect to each patient. **Objective:** To determine the possible association of specific disease [*Paandu*] on the basis of *Dhegi* characterization. **Methods:** In this analytical case control study, a total of 102 were screened and 6 patients were excluded based on the exclusion criteria and 96 patients were included for the study of which 48 patients with *Paandu* were taken as cases and 48 patients without *Paandu* were taken as controls with age group of 20-60 years. The validated *Dhegi* Questionnaire was used to find the *dhegies* of anaemic patients in comparison with control group. **Results and Conclusion:** The association between *Paandu* (anaemia) and *dhegi* was calculated using Fisher exact test, where the p-value was found to be statistically significant. From this study it was concluded that individuals with *Kaba Dhegi, Kabavatha Dhegi* and *Kabapitha Dhegi* were observed to be more susceptible to *Paandu* (Anaemia) in comparison with the control group. So *Dhega Ilakkanam* can be used as a cost-effective diagnostic tool in identifying the preponderance of an individual to a particular illness as mentioned in the Siddha literature.

KEYWORDS: *Dhegi, Dhega ilakkanam, Paandu, Anaemia, Siddha, Udal iyal.*

INTRODUCTION

The Siddha system of Medicine is one of the antique medical systems of the world. This system deals with the subject of life in its various branches. As per Sage *Sattamuni*, the environment is same outside and within our body which illustrates that the body physiology is more related to the external environment and the body constitution is based on *Mukkuttram (Vatham, Pitham, Kabam)*. Every individual is born with their own basic body constitution is termed as *Dhegi*. During the formation of embryo, the body constitution which is primarily fused with *Sukkilam* or *Suronitham* determines the *Dhegi* of an Individual. The characters of an individual depend upon their *Dhega Illakanam (Udal Iyal)*. The *Dhegi* can be classified by *Vatham, Pitham*

and *Kabam* and the combination of these three *dhegies* as *Thondha Dhegi*. According to literature, a few peculiar pattern of diseases is more prone to particular *Dhegies*.^[1] So, the treatment strategies could be accordingly decided in respect of each patient.

According to the Siddha literature, *Paandu Noi (Paandu)* is more prone in *Kabam, Kabavatham* and *Kabapitham dhegies*.^[1] Anaemia is a serious global public health problem that particularly affects young children, women and pregnant women. According World Health Organisation the prevalence of Anaemia worldwide is 25%. In South East Asia 2019, Anaemia affected 40% of children between 6 months and 5 years of age, 37% of pregnant women and 30% of women 15-49 years of age.

It is most prevalent in low- and middle- income countries. Anaemia increases the risk of infections and death, impairs cognitive performance, and causes extreme fatigue, poor growth and development. It is a strong indicator of overall health.^[2]

The previous studies, Bijoya Chatterjee, et al, 2011, *Prakriti* – based medicine had reported that Ayurveda not only offers personalized lifestyle by way of both drug modalities suited to an individual's *prakriti* making it a holistic science.^[3] Zoufang Huang et al. Front Pharmacol. 2022, had reported that through successful coordination of “omics”, *Prakriti* – based treatments can help change the existing situation in health care and provide preventive medicine and improvement of life quality with longevity can be accomplished.^[4] Konjengbam.H et al. 2021 Correlation of body composition parameters and anthropometric somatotypes with *Prakriti* body types among the Meitei adults of Manipur, India had concluded that *Prakriti* assessment can explain an individual's fatness as it correlates with body composition parameters and could be used to predict risk susceptibility to various complex disorders.^[5] Subhojit Dey et al. 2014 *Prakriti* and its associations with metabolism, chronic diseases, and genotypes: Possibilities of new born screening and a lifetime of personalized prevention had concluded that knowing the *prakriti* of a new born can lead to inculcation and adoption of lifestyles of a new born that will result in prevention of chronic diseases and more healthy high quality life for an individual.^[6] An unpublished study in Dr.M.G.R university repository by Rasitha. P (2022) had reported that *Kabavatha Dhegi* individuals were observed to be more susceptible to *Pakkavatham* condition.^[7] Rajkumar Chinthala et al. J Ayurveda Integr Med. 2023 had concluded that vata predominant DP has a significant association with *Amavata*. *Vata* predominant individuals are more susceptible to *Amavata* than *Pitta* and *Kapha* predominant DP individuals.^[8]

Dhega Ilakkanam assesment is one of the fundamental keys for diagnosis of the diseases which helps to find the physical and psychological aspect of an individual, realizing the phenotypes and exploring the role of genomics through targeted interventions by traditional systems may help disease prevention efforts. This will promote the personalized approach of preventive care via *Siddha* system of medicine and helpful for a particular individual thereby modifying the lifestyle and dietary regimen for management of the developed ailment. The purpose of the study was to explore the association between the specific disease [*Paandu*] and the *Dhegi* of an individual.

MATERIALS AND METHODS

This analytical case control study was conducted in out patient and in patient department of *NoiNaadal* in Ayothidoss Pandithar hospital, National Institute of Siddha for a period of 18 months. This study was

approved by the Institutional Ethical Committee of No: NIS/IEC/2021/D – 8 dated on 25/11/2021 and it was also registered in Clinical Trial Registry No: CTRI/2023/02/049508. In this study, a total of 102 were screened and 6 patients were excluded based on the exclusion criteria and 96 patients were included for the study of which 48 patients with *Paandu* were taken as cases and 48 patients without *Paandu* were taken as controls with age group of 20-60 years. The validated thirty item *Dhegi* Questionnaire^[9] was used to find the *dhegies* of anaemic patients in comparison with control group.

ELIGIBILITY CRITERIA FOR CASES

INCLUSION CRITERIA

- Age 20 - 60 years.
- Gender - Male, Female and Transgender.
- Patients with *Paandu* [Anaemia] with Haemoglobin moderate [8.0-10.9] to severe [lower than 8.0]^[2]

EXCLUSION CRITERIA

- Patients not willing to sign in consent form.
- Patients with chronic systemic illness.
- Vulnerable groups (children, pregnant women, cognitively impaired).

ELIGIBILITY CRITERIA FOR CONTROLS

INCLUSION CRITERIA

- Age: 20 – 60 years.
- Gender: Male, Female and Transgender.
- Patients without *Paandu* [Anaemia]

EXCLUSION CRITERIA

- Patients not willing to sign in consent form.
- Vulnerable groups (children, pregnant women, cognitively impaired)

Sample size

A Pilot study was conducted with 40 participants in which 20 were cases and 20 were controls.

Based on the observations the results obtained from this study,

- Hypothetical proportion of cases with exposure- 75%
- Hypothetical proportion of controls with exposure- 45%
- Least extreme odds ratio to be detected- 3.67
- Two sided confidence interval (1- alpha)- 95
- Power (% chance of detecting)- 80
- Ratio of cases to controls -1.0

From the above data, sample size was calculated in open epi using Fleiss with CC method and arrived as follows,

Cases – 48

Controls – 48

Total sample size - 96

CONDUCT OF THE STUDY

In this study, a total of 102 were screened and 6 patients were excluded based on the exclusion criteria and 96

patients were included for the study of which 48 patients with *Paandu* were taken as cases and 48 patients without *Paandu* were taken as controls. Individual *dhegi* was assessed through Siddha based text *Dhegi* questionnaire to predict the possibilities of *Dhegi* characterization in association with diseased condition as mentioned in literature. Based on the sample size derived from the pilot study, the patients were included based on inclusion and exclusion criteria and then informed consent in written was obtained from the study subjects. Prepared questionnaire with particular score from Siddha literature^[12] for each *Dhegi* was filled by principal investigator for each study subjects. Then the patients were subject to analysis of specific *Dhegi* features and

documented for the frequency of features. *Dhegi* scoring method was evolved through statistical method.

STATISTICAL ANALYSIS

- All collected data were entered in MS Excel Software by the investigator.
- Tables and bar charts were generated to represent the frequency or the percentage distribution of demographic data of the patients.
- The Fisher Exact Test (P value) was calculated using SPSS IBM Software for the determination of possible between specific body constitution and *Paandu* and the P value less than 0.05 were considered statistically significant.

OBSERVATIONS AND RESULTS

Distribution of Gender

| GENDER | No of cases (%) | No of controls (%) |
|--------|-----------------|--------------------|
| FEMALE | 44 (92%) | 31 (65%) |
| MALE | 4 (8%) | 17 (35%) |

In 48 cases, the female were around 92% and the male were around 8%. The majority of the cases were females. In 48 controls, the female were around 65% and male

were around 35% and the majority of the controls were females.

Age Distribution

| Age in Years | No. of cases (%) | No. of Controls (%) |
|--------------|------------------|---------------------|
| 20-30 | 0 (0%) | 8 (16%) |
| 31-40 | 11 (23%) | 10 (21%) |
| 41-50 | 27 (56%) | 10 (21%) |
| 51-60 | 10 (21%) | 20 (42%) |

Among 48 cases, 0% in 20 – 30 years, 23% in 31 – 40 years, 56% in 41 – 50 years and 21% in 51 – 60 years.

Among 48 controls, 17% in 20 – 30 years, 21% in 31 – 40 years, 21% in 41 – 50 years and 42% in 51 – 60 years.

4. Disease Distribution

| <i>Paandu</i> | No of cases (%) |
|---------------|-----------------|
| Moderate | 38 (80%) |
| Severe | 10 (20%) |

Among 48 *Paandu* patients, 20% had severe condition and 80% had moderate condition based on Hemoglobin level.

Food Habits

| Diet | No of cases (%) | No of controls (%) |
|---------|-----------------|--------------------|
| Veg | 7 (15%) | 2 (4%) |
| Non veg | 41 (85%) | 46 (96%) |

Among 48 *Paandu* patients, 85% were non vegetarians and 15% were vegetarians. In 48 controls 4% were vegetarians and 96% were non vegetarians.

Distribution of Other Habits

| Other Habits | No of Cases (%) | No of Controls (%) |
|-------------------|-----------------|--------------------|
| Pica | 13 (27%) | 0 (0%) |
| Betel nut chewing | 2 (4%) | 2 (4%) |
| None | 33 (69%) | 46 (96%) |

Among 48 *Paandu* patients, 69% of patients had no habits like Pica, 27% had habit of Pica like eating raw rice and 4% had the habit of betel nut chewing. Among

48 controls 96% had no habits like Pica and 4% had the habit of betel nut chewing.

Distribution of Menstrual history

| Menstrual History | No. of Cases (%) | No. of Controls (%) |
|--------------------|------------------|---------------------|
| Normal cycle | 16 (36%) | 14 (45%) |
| Oligomenorrhea | 3 (7%) | 1 (3%) |
| Menorrhagia | 6 (14%) | 0 (0%) |
| Menopause attained | 19 (43%) | 16 (52%) |

Among 92% female cases, 42% had normal cycle, 40% were attained menopause, 6% had oligomenorrhea and 12% had menorrhagia. Among 65% female controls,

52% were attained menopause, 45% had normal menstrual cycle and 3% had oligomenorrhea.

Distribution of Economic Status

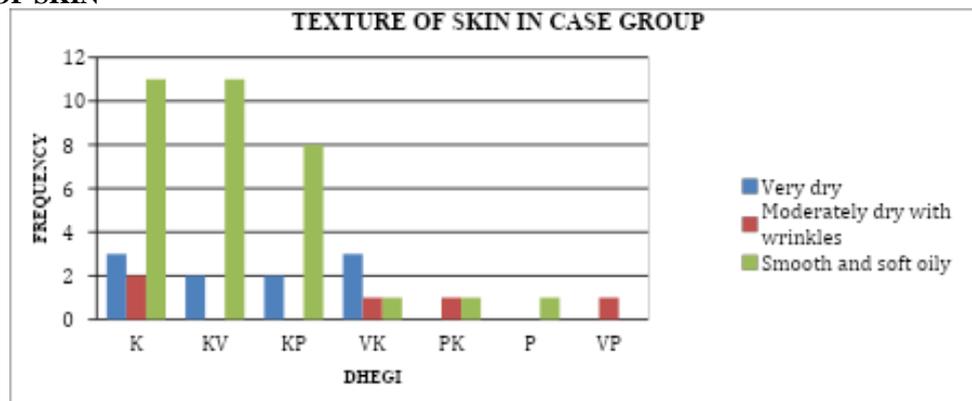
| Economic Status | No of Cases (%) | No of Controls in % |
|-----------------|-----------------|---------------------|
| Poor | 15 (31%) | 19 (40%) |
| Middle class | 28 (58%) | 28 (58%) |
| Rich | 5 (11%) | 1 (2%) |

Among 48 patients, 58% were middle class people, 31% were in below poverty and 11% were in above poverty. Among 48 controls 58% were middle class people, 19% were in below poverty and 2% were in above poverty line.

Distribution of cases responding Dhegi Questionnaire

The observation of the body constitution was done by explaining the 30 different types of questions and categorized as *Vatham*, *Pitham* and *Kabam*. After answering such type of questions and assessed the more preponderance which was deserved as their natural element of the body. The responses to the questionnaire by the cases were listed below,

TEXTURE OF SKIN

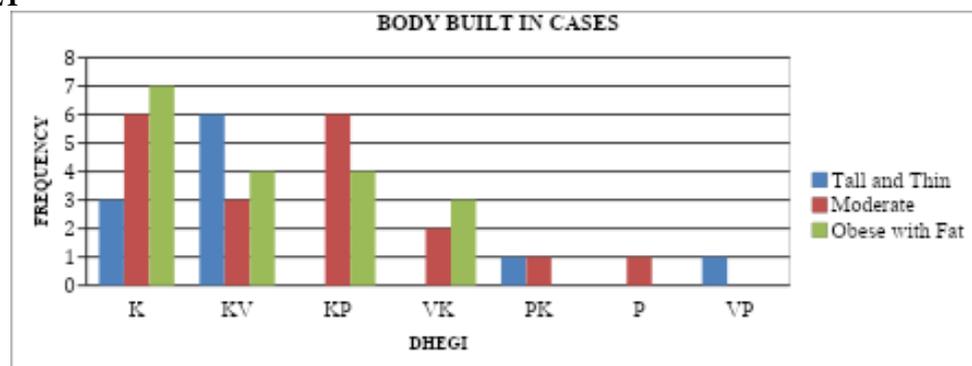


Graph 6.9: Texture of Skin in Case group.

Observation

In 48 *Paandu* patients, more number of cases were *Kaba Dhegi* and *Kabavatha Dhegi* who had smooth and soft oily skin followed by *Kabapitha Dhegi*.

BODY BUILT

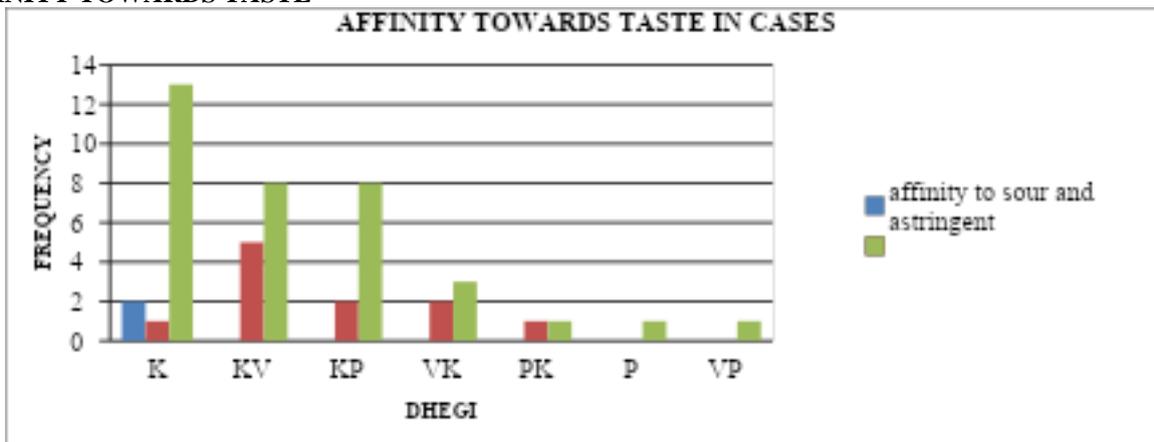


Graph - 6.19: Body Built in Case group.

Observation

In 48 Paandu patients, the body built was obese with fat as *Kaba Dhegi*.

AFFINITY TOWARDS TASTE

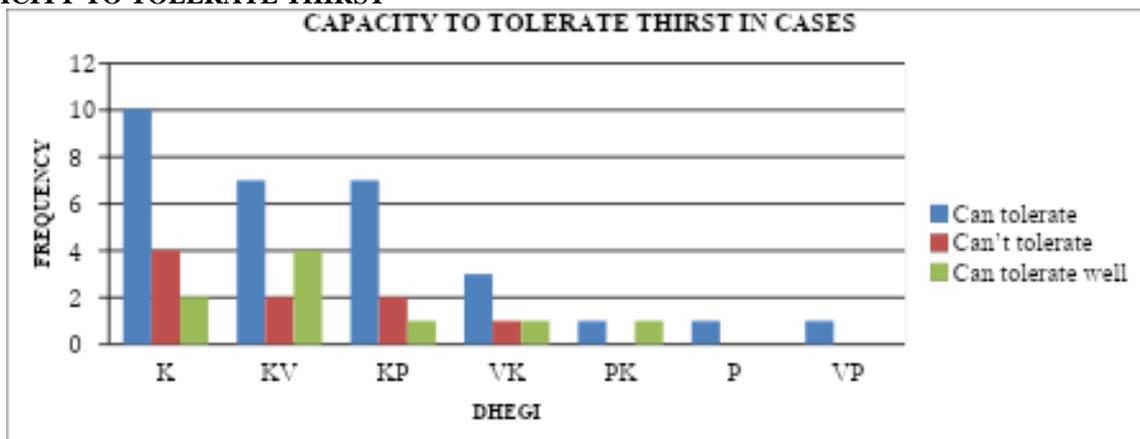


Graph - 6.21: Affinity towards Taste in Case group.

Observation

In 48 Paandu cases, the majority of them were Kaba Dhegi and they had the affinity towards sweet taste.

CAPACITY TO TOLERATE THIRST

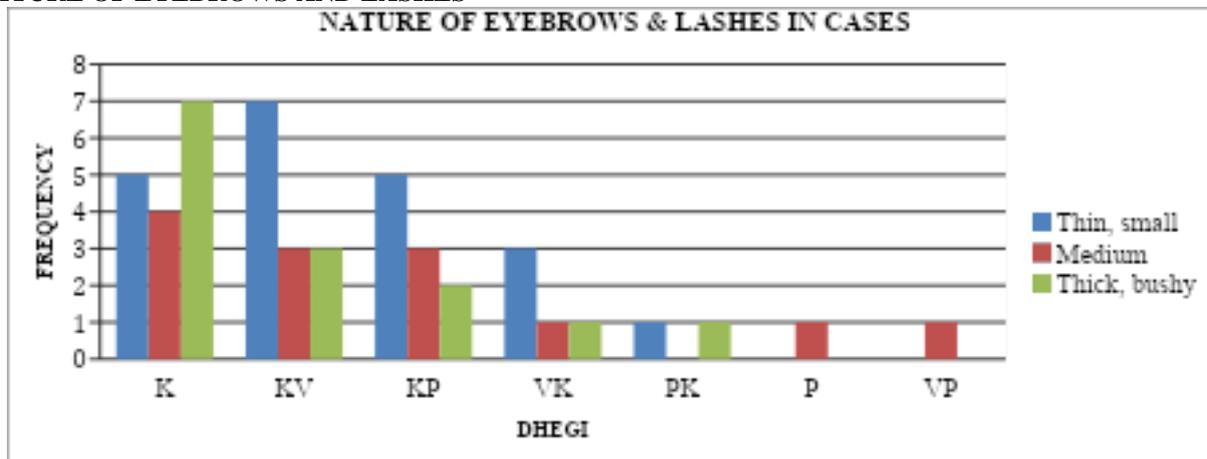


Graph - 6.27: Capacity to tolerate thirst in case group.

Observation

In 48 Paandu patients, most of were Kaba Dhegi and can tolerate thirst.

NATURE OF EYEBROWS AND LASHES

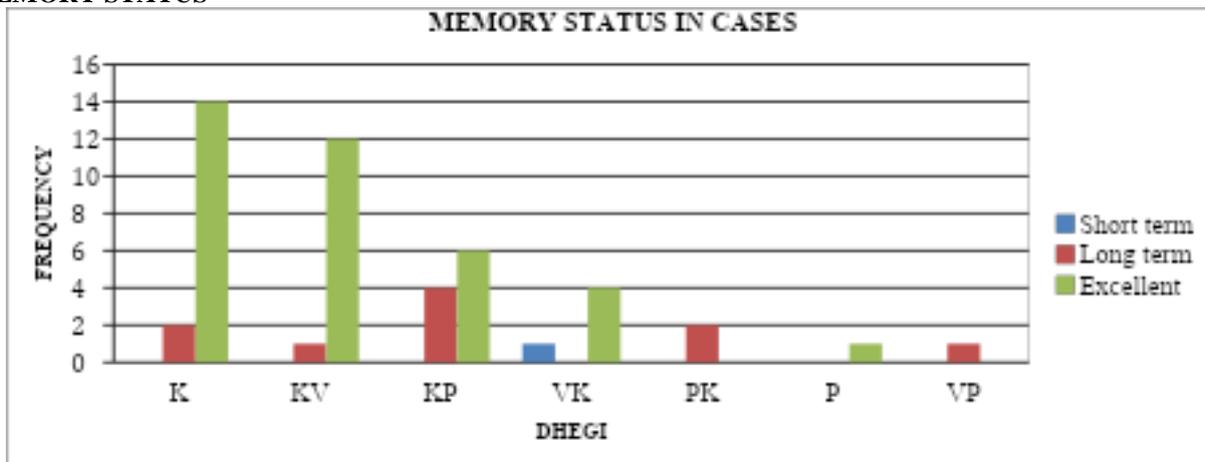


Graph - 6.29: Nature of Eyebrows and Lashes in Case group.

Observation

Among 48 *Paandu* patients 16 cases were *Kaba Dhegi* had the features of Thick and bushy eyebrows and lashes.

MEMORY STATUS

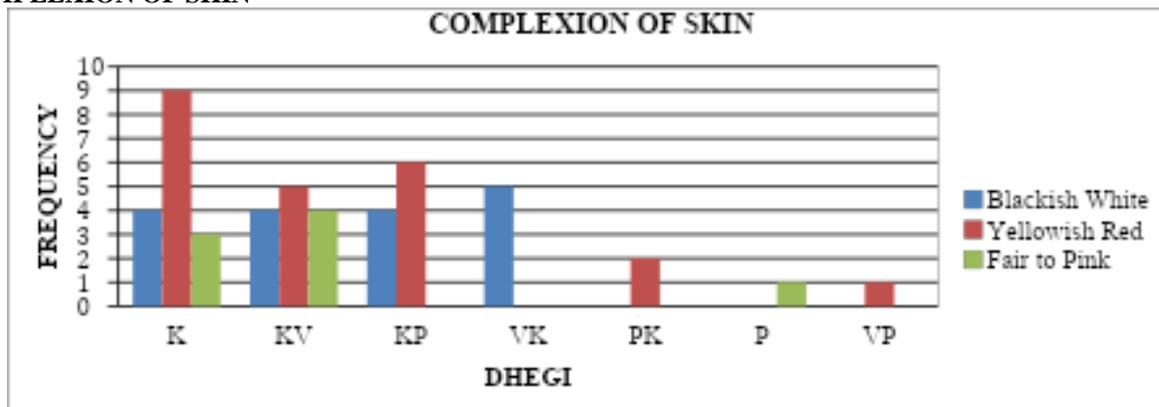


Graph - 6.53: Memory Status in Case group.

Observation

Among 48 *Paandu* patients, majority were *Kaba Dhegi* and had excellent memory status.

COMPLEXION OF SKIN

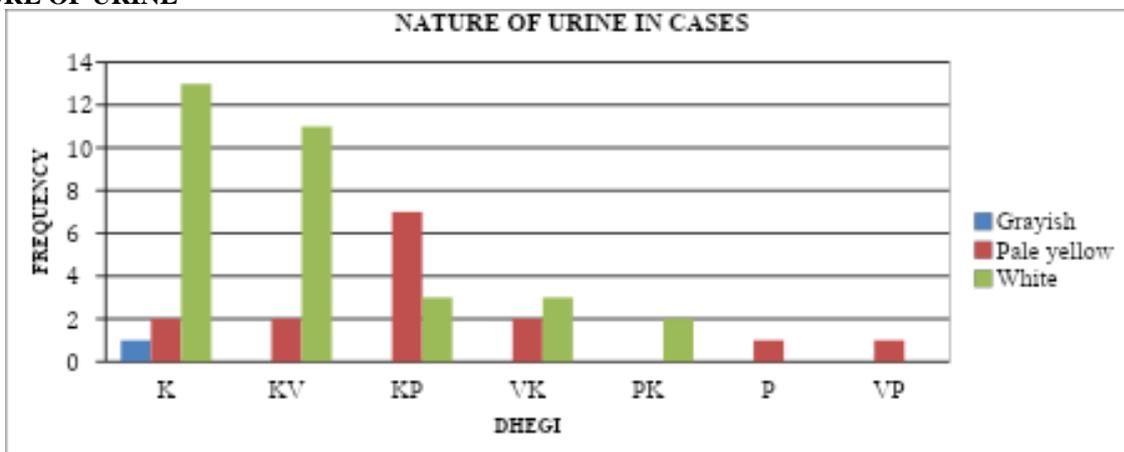


Graph- 6.11: Complexion of Skin in Case group.

Observation

Among 48 *Paandu* patients, majority of them were *Kaba Dhegi* and they had yellowish red skin.

NATURE OF URINE

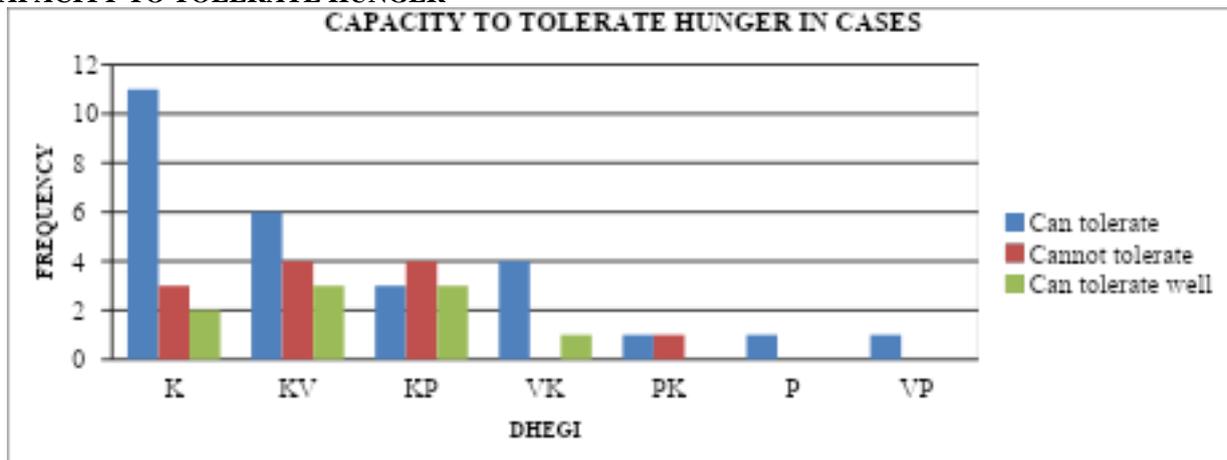


Graph - 6.33: Nature of Urine in Case group.

Observation

In 48 *Paandu* cases, most of them had the nature of urine as white which found in *Kaba Dhegi*.

CAPACITY TO TOLERATE HUNGER

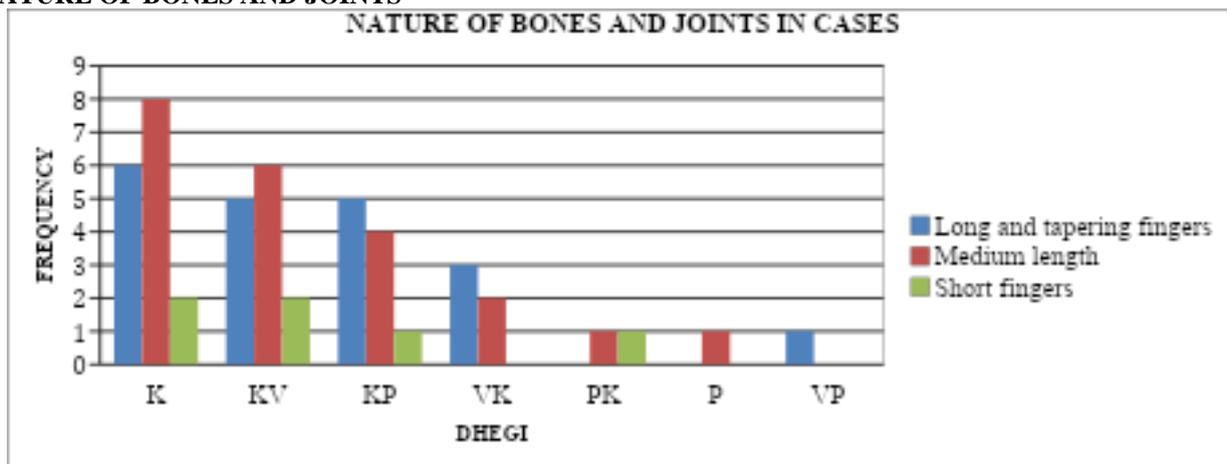


Graph - 6.35: Capacity to Tolerate Hunger in Case group.

Observation

Among 48 *Paandu* patients, 11 cases were *Kaba Dhegi* having capacity to tolerate hunger.

NATURE OF BONES AND JOINTS



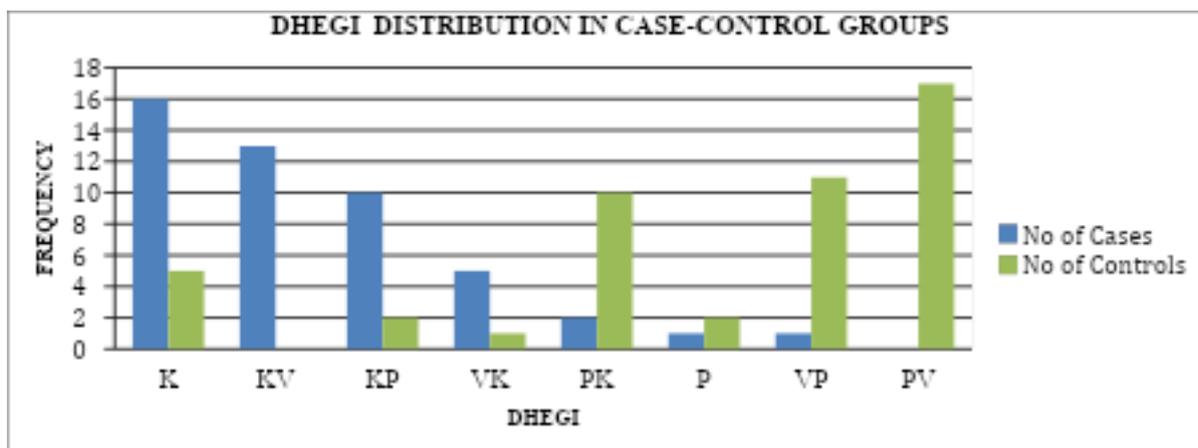
Graph - 6.61: Nature of Bones and Joints in Case group.

Observation

Among 48 *Paandu* cases, majority of them came under *Kaba Dhegi* and had fingers of medium length.

DHEGI DISTRIBUTION IN CASE- CONTROL GROUP

| Dhegi | No of Cases (%) | No of Controls (%) |
|-------------------------|-----------------|--------------------|
| Kabam (K) | 16 (34%) | 5 (10%) |
| Kabavatham (KV) | 13 (27%) | 0 (0%) |
| Kabapitham (KP) | 10 (21%) | 2 (4%) |
| Vathakabam (VK) | 5 (10%) | 1 (2%) |
| Pithakabam (PK) | 2 (4%) | 10 (21%) |
| Pithan (P) | 1 (2%) | 2 (4%) |
| Vathapitham (VP) | 1 (2%) | 11 (23%) |
| Pithavatham (PV) | 0 (0%) | 17 (36%) |
| Total | 48 | 48 |



Among 96 subjects, 34% were presented with Kaba Dhegi in case group whereas 10% in Control group.

STATISTICAL ANALYSIS

Statistical analysis was made to determine the possible association between *Dhega Ilakkanam*, *Naadi*, *Neikkuri* and *Paandu* 48 Cases and 48 Controls by using Fisher

Exact Test method and relationship between *Naadi*, *Neikkuri* and *Dhega Ilakkanam* and relationship between *Naadi* and *Neikkuri* in *Paandu* cases. The inferences were as follows,

1. Analysis of *Dhega Ilakkanam* in case-control group

Table-7.1 Analysis of *Dhega Ilakkanam* in case-control groups (Fisher Exact test)

| <i>Dhega Ilakkanam</i> | Group | | Total | Test Value | P-Value |
|------------------------|-------|---------|-------|------------|---------|
| | Case | Control | | | |
| <i>Kabam</i> | 16 | 5 | 21 | 64.081 | 0.000 |
| <i>Kaphavatham</i> | 13 | 0 | 13 | | |
| <i>Kaphapitham</i> | 10 | 3 | 13 | | |
| <i>Vathakabam</i> | 5 | 0 | 5 | | |
| <i>Pithakabam</i> | 2 | 10 | 12 | | |
| <i>Pitham</i> | 1 | 2 | 3 | | |
| <i>Vathapitham</i> | 1 | 11 | 12 | | |
| <i>Pithavatham</i> | 0 | 17 | 17 | | |
| Total | 48 | 48 | 96 | | |

*P<0.05 Significant, Otherwise not significant

OBSERVATION

Using Fisher Exact test, the test value of case-control group is found to be 64.081 and the P value is 0.000.

Inference

Analysis of *Dhega Ilakkanam* in *Paandu* condition is statistically significant.

DISCUSSION

Anemia (*Paandu*) is a medical condition in which the red blood cell count or haemoglobin is less than the normal and the presenting features of Anemia are tiredness, generalised muscular weakness, lethargy, headache, constipation, loss of appetite and menstrual disturbances such as amenorrhoea and menorrhagia. This case-control observational study was aimed to determine the possible association between *Dhega Ilakkanam* with *Paandu*. This study was approved by the Institutional Ethical Committee of No: NIS/IEC/2021/D – 8 dated on 25/11/2021 and it was also registered in Clinical Trial Registry No: CTRI/2023/02/049508.

As this study type was not carried before for *Paandu noi*, the IEC members suggested to conduct a pilot study to derive appropriate sample size. As per the suggestions, a pilot study was conducted in National Institute of Siddha with 40 participants in which 20 were cases and 20 were controls. Based on the observations and results obtained from this pilot study, the sample size was calculated as cases – 48, controls – 48 and total sample as 96 in open epi using Fleiss with CC method.

In this study, a total of 102 were screened and 6 patients were excluded based on the exclusion criteria and 96 patients were included for the study of which 48 patients with *Paandu* were taken as cases and 48 patients without *Paandu* were taken as controls. Individual *dhegi* was assessed through Siddha based text *Dhegi* questionnaire to predict the possibilities of Dhegi characterization in association with diseased condition as mentioned in Siddha literature^[1] based on the sample size derived from the pilot study.

Among the recruited participants, 92% of the cases (*Paandu*) were female which was higher in comparison with controls where genders were equally distributed. The preponderance of Anemia is higher in females according to Nowaj Sharif et al, this study correlates to it.^[14]

Among 48 cases, none of them in 20-30 years, 23% in 31-40 years, 56% in 41-50 years and 21% in 51-60 years. Among 48 controls, 17% in 20-30 years, 21% in 31-40 years, 21% in 41-50 years and 42% in 51-60 years.

Among the cases recruited, 31% cases had habits like pica and betel nut chewing and whereas in case of control none of the recruited participants had such habits. According to Siddha literature, one of the etiologies of *Paandu* is due to intake of ash, pica, mud etc. and the study observation justifies the literature.^[1]

Among 92% female participants in cases, 42% had normal cycle, 40% had attained menopause, 6% had oligomenorrhea and 12% had menorrhagia. Among 65% female participants in controls, 52% had attained menopause, 45% had normal menstrual cycle and 3% had oligomenorrhea. In this study the observation does not correlate to prevalence menstrual abnormalities in females with Anemia according to Siddha literature this may be due to smaller sample size.

Among 48 patients, 58% were middle class people, 31% were in below poverty and 11% were in above poverty. Among 48 controls 58% were middle class people, 19% were in below poverty and 2% were in above poverty. In this study the observation does not correlate to prevalence anemia with different socio economic status.

Finally it was assumed that a sizable percentage of *Paandu* patients were *Kaba Dhegi* (34%) followed by *Kabavatha Dhegi* (27%) and *Kabapitha Dhegi* (21%) with the characters of smooth, soft and yellowish red skin, obesity, affinity towards sweet taste, thick and bushy eyebrows and lashes, capacity to tolerate thirst and hunger, excellent memory as mentioned in literature^[1] and in control group the majority of them were *Pithavatha Dhegi* (35%) and *Vathapitha Dhegi* (23%)

The Statistical analysis was calculated using Fisher Exact test for association of the disease with *Dhega ilakkanam*. It was found to be significant. Thus the observed statistical analysis correlated to the associations of the *Paandu Noi* with *Kabam*, *Kabavatham* and *Kabapitham Dhega Ilakkanam* as mentioned in Siddha literature.^[1]

The results observed of the study statistically justifies that there is strong association of the *Paandu Noi* with *Dhega Ilkanam* according Siddha literature.^[1]

CONCLUSION

From this study it was concluded that individuals with *Kaba Dhegi*, *Kabavatha Dhegi* and *Kabapitha Dhegi*

were observed to be more susceptible to *Paandu* (*Anemia*) in comparison with the control group. So *Dhega Ilakkanam* can be used as a cost-effective diagnostic tool in identifying the preponderance of an individual to a particular illness as mentioned in the Siddha literature.

LIMITATIONS AND RECOMMENDATIONS

Since the sample size was very small there was less variability among the participants and hence the strong association could not be suggested through the study. Further study will be conducted to assess the specific *Dhegi* which is individualized for specific types of Anemia with large sample size.

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