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TO EVALUATE THE EFFICACY OF MUDGA MASURA ADAKI YUSHA AS PATHYA IN PANDU ROGA W.S.R TO IRON DEFICIENCY ANAEMIA – A CLINICAL STUDY

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ABSTRACT

Background &Objective: *Pandu Roga* is a *Pitta Pradhana Tridosha Vikara* associated with *Rasa* and *Raktha Vaha Srotas*. It is characterized by *Pandu Varnata, Arohana Ayasa, Dourbalya*, *Bhrama, and Hrudaya Spandhana*. Anaemia is the most prevalent Nutritional deficiency disorder in the world, it affects all age groups but the most vulnerable are preschool age children, pregnant women and non-pregnant woman of childbearing age. Anaemia is a condition where haemoglobin concentration of the individuals falls below the lower limit of the normal range for the age and sex of the individual. Its common clinical features include pallor, exertional dyspnoea, tiredness, and giddiness, and can be correlated with *Pandu Roga.* **Methods**: An Interventional Single Arm Clinical Study conducted in 30 subjects for a period of 30 days. Clinical features and Hematological parameters were documented before and after the treatment. Observations were analyzed and findings were evaluated by using Software stigma STAT-3 and statistical analysis done by Wilcoxon signed rank test and paired t test. **Results:** The study shows that *Mudga Masura Adaki Yusha* have significant effect in clinical features and Haematological parameters significantly. The results obtained were found to be statistically significant at p<0.001 except for

Blood picture and RBC shows p=1.000 and p=0.161 respectively. **Conclusion:** *Mudga Masura Adaki Yusha* has significant effect in *Pandu Roga*.

Keywords: *Mudga Masura Adaki Yusha,* Anaemia, *Pandu Roga*

INTRODUCTION

Pandu Roga (anaemia) is a *Pitta Pradhana Tridosha Vikara* associated with *Rasa and Raktha Vaha Srotas* causing *Sapta Dhatu Kshaya* and *Ojokshaya.* [1] Pandu Varnata, Arohana Ayasa, Dourbalya, Bhrama, and Hrudaya Spandhana characterize it. In *Pandu*, *Pitta* gets aggravated by the indulgence of their respective causative factors.[2] In Ayurveda, *Pandu Roga* is considered as an independent disease with its own specific *Nidana, Purvarupa, Rupa, Samprapti and Chikitsa*. Thus, an attempt has been made to study the disease *Pandu Roga* (Anaemia) according to Ayurvedic literature. *Acharya Charaka* has mentioned *Rakthalpata* in *Pandu Roga*,[3] So *Pandu Roga* can be compared to Anaemia. Anaemia is a condition where haemoglobin concentration of the individuals falls below the lower limit of the normal range for the age and sex of the individual [4]. Its common features include pallor, exertional dyspnoea, tiredness, and giddiness [5]. Anaemia is the most prevalent nutritional deficiency disorder in the world, it affects all the age groups but the most vulnerable are preschool age children, pregnant women and non-pregnant woman of childbearing age. [6] Nutritional iron deficiency is the most common cause of Anemia in India, the recent article published in the year 2020 states that prevalence of Anaemia is approximately 51% of Indian population [7]. Iron Deficiency is a systemic disease which involves multiple systems rather than a mere Haematological condition associated with Anaemia. This is the summit where the basic pathological changes of both Iron Deficiency Anaemia and *Pandu Roga* explained in Ayurveda go hand in hand. As explained by *Acharya,* the pathology of *Pandu Roga* is mainly triggered with vitiation of *Pitta* which in turn vitiates *Vata* and *Kapha* along with *Raktadi dhatus*, leading to manifestation of *Pandubhava* as the major clinical finding associated with other systemic features. [8]

According to Acharya *Kashyapa*, *Ahara* is considered as *Mahabhaishajya*. *Yusha* is one among the *Pathya Kalpana* having properties like *Rochana, Deepana, Vrishya,* and also enhances *Swaravarna, Bala* and *Agni.* [9] *Mudga Masura Adaki Yusha* is a preparation explained in *Bhaishajya Ratnavali* in the context of *Pandu Roga*. [10] These *Dhanya Vargas* are rich in Iron contents. [11] Therefore the adequate usage of this *Yusha* may increase the Haemoglobin level of an individual owing to a cure in Iron Deficiency Anaemia. Good nutrition and a habit of balanced diet can improve the quality of life which will in turn impart a safer and healthier way to prevent diseases without medications. Hence this study is an attempt to evaluate the efficacy of *Mudga Masura Adaki Yusha* as *Pathya* in *Pandu Roga*

METHODOLOGY:

The ethical clearance for the study (approval no: ICEC//AS/23) was obtained from the Institutional Clinical Ethics Committee on 24.07.2021 at Alva's Ayurveda Medical College, Vidyagiri, Moodubidiri.

Study population: 30 patients fulfilling the diagnostic and inclusion criteria irrespective of gender, religion, occupation, marital status, socio economic status and educational status was selected from the OPD of Alva's Ayurveda Medical College and Hospital, Moodubidire, Camps and other referrals was taken and intervened with *Mudga Masura Adaki Yusha* for 30 days and followed up to 45 days.

Method of collection of Data: A detailed proforma was prepared considering the points pertaining to consent, history taking, signs, symptoms and examination as mentioned in Ayurveda & contemporary science.

Design of clinical study: It was an open labelled, non- randomized, Single Arm study with Pre and Post-test design.

Diagnostic and Inclusion criteria: Patients presenting with *Panduta, Arohana Ayasa* and *Dourbalya* with or without other *Lakshna* of *Pandu Roga,* Haemoglobin percentage between 8-12gm% in males and 8-11gm% in females and Blood picture presenting with either Microcytic Hypochromic or Normocytic Hypochromic Anaemia, Patients belonging to either sex between the age group 18-60 years was considered for the study.

Exclusion criteria: Patients suffering from infectious diseases, *Pandu Roga* resulting from acute or chronic blood loss and bleeding disorders, Patients with systemic disorders that would interfere with the course of the study, Pregnant and lactating mother and Congenital hereditary Anaemia.

Intervention: After getting informed consent, subjects were given 150 ml of *Mudga Masura Adaki Yusha* in the evening for 30 days.

Study duration: Total 45 days including 30 days' intervention and follow up for 15 days.

Table:1 Method of preparation of *Yusha* [12]

INGREDIENTS	QUANTITY	METHOD OF PREPARATION
• *Mudga* • *Masura* • *Adaki* • Water • *Ghrita* • *Saindhava lavana* • *Trikatu*	50 gms 900 ml 2.5 ml 1 Pinch	• 1 part of *Dhanya Varga* was taken along with 18 parts of water and kept boiling. • Once it completely cooked, *Ghrita, Saindhava Lavana* and *Trikatu Choorna* were added.

ASSESSMENT CRITERIA: The results were evaluated by subjective and objective parameters mainly based on clinical observation by grading method and laboratory values.

Laboratory investigations like Hb gm%, RBC, PCV, MCV, MCH, MCHC and Blood Picture.

Statistical analysis: Statistical analysis was done by using Stigma STAT- 3 version. Paired t - test was applied to see the difference of pre & post - test parameters, Wilcoxon signed rank test was used for analyzing the effectiveness of the treatment on subjective parameters.

Table:2 Grading used for overall Assessment of Treatment Effect

	Parameters	Grading
1. *AROHANA AYASA* (Tired While Climbing)	Absent Up to 30 Stairs	0
	Between 20-30 Stairs	1
	Between 10-20 Stairs	2
	Within 10 Stairs	3
2. *PANDUTA* (Pallor)	No Pallor	0
	Conjunctiva Slightly Pale, Nails and Mucous Membrane Not Pale	1
	Conjunctiva Pale, Mucosa and Nails Slightly Pale	2
	Conjunctiva, Mucosa and Nails Pale	3
3. *DOURBALYA* (Weakness)	No weakness	0
	Able to perform moderate activity	1
	Able to perform mild activity	2
	Activities cannot be performed	3
4. Blood Picture	Normocytic normochromic	0
	Normocytic hypochromic	1
	Microcytic hypochromic	2

RESULTS:

Effect on *Panduta*: The initial mean score of *Panduta* on 0th day i.e. before treatment was observed to be 1.067 with SD of 0.74. During the study period, the mean score of 15th day was 1.033 with S.D of 0.718, the mean score of 31st day was 0.4 with S.D of 0.621. In the follow-up period of 45th day the mean value of *Panduta* was 0.4 with S.D of 0.621. The initial mean score of *Panduta* was 1.067 and which was reduced to 0.4 after the treatment and the p value is <0.001 suggestive of statistically significant difference. Before treatment 23 subjects presented with *Panduta* and not observed in 7 subjects. After treatment the symptoms were reduced in 11 subjects. 62.51% of relief of symptom was found and showed marked changes in *Panduta* symptom.

Effect on *Arohana Ayasa*: The initial mean score of *Arohana Ayasa* on 0th day i.e. before treatment was observed to be 1.8 with S.D of 0.714. During the study period, the mean score of 15th day was 1.586 with S.D of 0.682, the mean score of 31st day was 0.8 with S.D of 0.664. After the follow-up period of 45th day the mean score was 0.733 with S.D of 0.583. Statistical analysis showed that the changes that occurred with the treatment is greater, the initial mean score of *Arohana Ayasa* was 1.8 and which was reduced to 0.8 after the treatment with p value <0.001 suggestive of statistically significant difference. Before treatment 29 subjected were presented with *Arohana Ayasa* out of 30 subjects and after treatment it was reduced in 9 subjects. There was 55.55% relief of symptom was found and showed marked changes in symptom of *Arohana Ayasa*

Effect on *Dourbalya*: The mean score of *Dourbalya* before treatment was observed to be 1.2 with S.D of 0.551. During the study period, the mean score of 15th day was 0.8 with S.D of 0.664 and the mean score of 31st day was 0.167 with S.D of 0.379. In the follow-up period of 45th day the mean value of *Dourbalya* was 0.3 with S.D of 0.466. Statistical analysis showed that the changes that occurred with the treatment are greater, the initial mean score of *Dourbalya* was 1.2 and which was reduced to 0.167 after the treatment with p value <0.001 suggestive of statistically significant difference. Before treatment 28 subjects were presented with *Dourbalya* and after treatment it was reduced to 23 subjects. 86.31% relief of symptom was found.

Table: 3 Treatment Effect on Objective Criteria (0-31st Day)

VARIABLE	MEAN		S.D		S.E		t value	P value
	BT	AT	BT	AT	BT	AT		
Hb%	10.403	10.800	0.908	0.904	0.166	0.165	-14.744	<0.001
Blood picture	0.333	0.333	0.547	0.547	0.0998	0.0998	0.000	=1.000
RBC	3.987	3.981	0.264	0.259	0.0475	0.0465	1.438	=0.161
PCV	31.643	32.473	2.612	2.612	0.477	0.481	-8.356	<0.001
MCV	77.134	78.467	7.125	6.958	1.301	1.270	-12.384	<0.001
MCH	25.980	26.537	2.808	2.654	0.513	0.485	-10.986	<0.001
MCHC	32.920	33.180	1.435	1.420	0.262	0.259	-9.967	<0.001

Laboratory Parameters:

Among the laboratory parameters, the increase in the Hb gm% fell in the range between 0.3 gm% to 0.7 gm%. Statistical significance of Hemoglobin, RBC, PCV, MCV, MCH, MCHC was p<0.001, except for RBC and Blood picture that was obtained as p=0.161 and p=1.000. RBC and Blood picture has not shown highly significant result since the period of consumption of drug, that is 30 days is not sufficient for producing changes in the structure of RBC. But finally, depending upon all other variables, *Mudga Masura Adaki Yusha* shows statistically significant effect in *Pandu Roga.*

DISCUSSION

Malnutrition either due to inadequate dietary intake or lack of a balanced diet and population explosion in today's world has led to the development of various

diseases and *Pandu Roga* is one among them. *Pandu roga* is a *Pitta Pradhana Rasa, Raktha Vaha Srotho- dushti Vikara* which Pandu Varnata, Arohana Ayasa, Dourbalya, Bhrama, and Hrudaya Spandhana charac- terize. *Pandu Roga* is classified in to mainly five types, *Vataja, Pittaja, Kaphaja, Sannipataja* and *Mridbhakshanajanya Pandu*.[13] *Pandu Roga* is char- acterized by the paleness of the body which may be due to reduced blood flow and oxygen or by a de- creased number of red blood cells and Anaemia is one of the most common causes of paleness so *Pandu Roga* can be correlated with Anaemia. Anaemia is a condition where the haemoglobin concentration of the individuals falls below the lower limit of the normal range for the age and sex of the individual. Its common features include pallor, exertional dyspnea, tiredness, and giddiness. 88 Anaemia is a major glob- al public health problem having an influence on health as well as social and economic development affecting both developing and developed countries. Globally, Anaemia affects 1.62 billion people, corre- sponding to 24.8% of the population. Nutritional Anemia is caused when there is an inadequate body store of a specific nutrient needed for Hb synthesis. The onset of Iron Deficiency Anemia is generally slow. The usual symptoms are weakness, fatigue, dyspnea on exertion, palpitations and pallor of the skin, mucus membranes and sclera. Excessive con- sumption of *Kshara, Lavana Ahara* , unwholesome regimen leads to the *Pitta Pradhana Dosha Prakopa*, this leads to the *Dhatu Pradushana* of *Rakta* .Vitiated *Pitta* in the *Hrudaya* due to *Kupita Vata* gets expelled out of its *Sthana* and enters the *Dasha Dhamanis* and spreads throughout the body and gets located in be- tween the skin and muscle tissue and does the further vitiation of the *Kapha, Vata, Tvacha, Rakta, Mamsa* and manifesting into the disease *Pandu Roga* a as a result of which different types of discolouration like *Pandu, Haridra* and *Harita* appear in the skin The main line of treatment for *Pandu Roga* is *Shodana* and *Shamana Chikitsa*. Along with the *Chikitsa Pathya* plays an important role in treating the diseas- es. *Acharya* have given more importance for *Pathyaapathya*. According to *Acharya Kashyapa,*

Ahara is considered as *Mahabhaishajya*. *Yusha* is one of the *Pathya Kalpana*. As rightly quoted by *Vaidya Lolimbraj* in his book *Vaidya Jeevanam* stating that if one follows *Pathya* properly then there is no need of medicines and if one doesn't follow *Pathya* properly there is also no use of medicines. Hence in this pre- sent study *Mudga Masura Adaki yusha* was given as *Pathya* in *Pandu Roga*.

Probable Mode of action of *Mudga Masura Adaki Yusha*: *Yusha* is one among the important *Ahara Kalpana* mentioned in our classics having properties like *Rochana, Deepana, Vrishya*, and also enhances *Swara, Varṇa, Bala* and *Agni*. It brings about *Tushti, Pushti* and *Sukha* to our *Shareera* and *Manas*. It is *Tridosha Shamaka* property. [14] *Mudga Masura Ada- ki Yusha* is a preparation explained in *Bhaishajya Ratnavali* in the context of *Pandu Roga*. [15] These *Dhanya Vargas* are rich in iron contents. In *Pandu roga* if the *Usna Guna* increases then the *Pitta* is fur- ther vitiated causing *Kshapana* of *Rasa Prasada Bhaga*, which does *Poshana* of *Raktha Dhatu.* This induces *Roukshaya bhava* in the individual. *Mugda* possesses *Kashaya Madhura Rasa, Laghu Rooksha Guna, Sheeta Veerya, Katu Vipaka* and having *Kapha Pitta Hara* and *Varnya* action imparts the normal color to the individual. *Masura* and *Adaki* having *Madhura Rasa, Laghu Rooksha Guna, Sheeta Veerya, Madhura Vipaka* and having *Kapha Pit- tasrajit* and *Varnya* action helps in the relief of *Pan- duta*. [16] The *Prakshepaka Dravya* like *Trikatu Choornam* having *Katu Rasa* and *Deepana* in action can improve the bioavailability of Iron. *Saindhava Lavana* possesses *Deepana, Pachana, Ruchya* and *Tridoshahara* property leading to *Ama Pachana* and *Ghrita* act as *Tridosha Shamaka* and mainly it is *Pit- tashamaka* and also *Yogavahi* in nature which by en- hances the absorption and medicinal qualities of *Yusha* and enhances the better action of drugs.[17] These drugs help in providing energy as a rich source of protein, being rich in vitamin B1, it extracts energy from our food and converts it into ATP (Adenosine triphosphate) and stored in our body, thus helps in the reduction of *Dourbalya*.

These pulses are rich in iron, folic acid, zinc, Vitamin A which are very instrumental in the formation of red blood cells. Carbohydrates, fats and proteins present in the pulses support the process of hemoglobin synthesis. Carbohydrates and fats form the succinic - CoA, which together bind with glycine will form Protoporphyrin. Formed Protoporphyrin combined with iron atom forms heme molecules and globin proteins to form Hemoglobin and Vitamin A helps in the absorption and utilization of Fe in body. [18]

CONCLUSION

The present clinical study was planned to study the effectiveness of *Mudga Masura Adaki Yusha* as *Pathya* in *Pandu Roga* w.s.r to Iron Deficiency Anaemia. The *Mudga Masura Adaki Yusha* has provided statistically significant results for subjective parameters like *Panduta*, *Arohana Ayasa* and *Dourbalya* as well as for objective criteria like Hb gm%, PCV, MCV, MCH and MCHC. There is no change in Blood Picture and RBC level. No adverse effects were reported during the entire study period. The present study was carried out on a limited number of patients. Hence, an extended study with more clinical parameters and on a large number of patients can be considered to precisely find the effect of treatment.

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