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Study the efficacy of *Murvadya Choorna Vati* in *Pandu Vyadhi* with special reference to Iron Deficiency Anaemia

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ABSTRACT

Rasa and *Rakta Dhatus* play very important role in our human life. *Rasa* and *Rakta* are considered as key factor for the nourishment and life maintenance of the body. In today's world of urbanization and modern lifestyle, many times it is seen that higher economic class and lower economic class are all malnourished under different circumstances. These factors include fast food, low nutritional value food, stressful & hectic life, which in turn contribute to create very common and well-known disease *Pandu*. On the basis of similarity of aetiological factors and symptoms *Pandu Vyadhi* can be correlated with Anaemia. Anaemia is a decrease in the total amount of red blood cells or haemoglobin in the blood or a lowered ability of the blood to carry oxygen. It is caused due to number of causes including nutritional deficiencies, acute or slow blood loss due to trauma or disease, destruction of red blood cells due to various metabolic and immunological abnormalities or toxins, diseases of the bone marrow, general systemic diseases like infection and various varieties of cancer, kidney failure etc. In the present study, *Murvadya Choorna Vati* is described by *Gada Nighraha* in *Pandu Vyadhi*. *Murvadya Choorna Vati* contains *Murva*, *Bala* and *Chitrak*. Hence it is used in *Pandu Vyadhi* due to its *Deepana*, *Pachana* and *Rasayana* property.

Key words: *Pandu*, *Anaemia*, *Murvadya Choorna Vati*, *Deepana*, *Pachana*

INTRODUCTION

Anaemia is a global public health problem affecting both developing and developed countries like India. It occurs at all stages of life cycle; but it is more prevalent in children and women of reproductive age groups.^[1] Among the different types of anaemia, Iron deficiency anaemia (IDA) is the most common cause of Anaemia globally. IDA constitutes for 75% of total Anaemia cases. IDA has various causes like impairment of RBCs production, nutritional deficiency and systemic disorders in developing countries.^[2]

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On the basis of similarity of aetiological factors and symptoms, it can be correlated with Anaemia. The name is derived from Ancient Greek word 'anaimia' meaning "lack of blood."

The prevalence of the disease is abundant especially in India. In modern medicine, many therapies are available. Many oral haematinics, parenteral iron and Vit. B12 preparations and in some severe cases of anaemia blood transfusion will be needed. Though these therapies have significant results, it is only for acute Anaemia. But for chronic anaemia which occur due to metabolic defects, no notable therapy is available. Also, haematinics which have best effects has some side effects like constipation, gastritis, flatulence etc. Ayurveda can provide better management this kind of side effects.^[3]

Iron deficiency anemia is one of the most common nutritional deficiencies^[4] It is *Pitta* dominant *Tridoshaja* disease where discoloration of skin occurs due to *Alpa Rakta* (reduced blood) or *Dushita Rakta* (vitiating blood). *Pandu Vyadhi* is mainly included under '*Santarpanjanya Vikara*'.^[5]

Iron Deficiency Anemia is thought to be the most common cause of Anemia globally as well as in our country.^[6] Its prevalence varies widely in different parts of the world. It is the commonest disorder all over the world and forms a major problem of mankind, especially in a developing country like India due to low socio-economic status, illiteracy and malnutrition in a major part of the population.^[7] It affects the physical and mental health.^[8]

The main goal for treating anemia is iron supplementation without correcting the metabolism. However, besides the lack of iron in diet, one of the main reasons of IDA is poor absorption of iron, which needs correction at the primary level. Haemoglobin is known to naturally vary according to age, sex as well as physiological status like pregnancy.^[9] Thus, a haemoglobin concentration below established specific cut-off values is indicative of anaemia. Although a moderate degree of anaemia may not affect every day work, it has massive impact on those engaged in heavy physical activity. The consequences of anaemia among women include reduced energy and capacity for work and poor pregnancy outcome that further enhances maternal mortality (Levin et al., 1993).^[10]

Rasavaha Srotas is the predominant *Srotas* to be vitiated in *Pandu Vyadhi* which is a *Rasapradoshaja Vikara* where in due to *Aharaj* and *Viharaj Hetu*, *Rasa Dhatu* formation is hampered.^[11] In *Pandu Vyadhi*, there is vitiation of *Tridosha* with predominance of *Pitta Dosha*. *Sadhak Pitta* and *Vyan Vayu* are mainly involve as both these reside in *Hrudaya*. These vitiated *Doshas* affect *Rasa Dhatu* which is circulated all over the body through *Dash Dhamani* by the influence of *Vyan Vayu*. This *Dushta Rasa Dhatu* gets *Sthanasanshraya* in between the *Twacha* and *Mamsa*. Further vitiation of *Kapha and Vata Dosha*, and *Rakta and Mamsa Dhatu* lead in manifestation of *Pandu Vyadhi*.^[12]

Hence, the present study with *Murvadya Choorna Vati* has been undertaken to evaluate the efficacy on the basis of subjective and objective parameters and also to find a cost-effective treatment for *Pandu Vyadhi*.

PRIMARY OBJECTIVE

To study the efficacy of *Murvadya Choorna Vati* in *Pandu Vyadhi* with special reference to Iron Deficiency Anaemia.

SECONDARY OBJECTIVES

To evaluate the effect of *Murvadya Choorna Vati* in *Pandu Vyadhi* with special reference to Iron Deficiency Anaemia on the basis of cardinal symptoms and changes in Haemoglobin and Sr. Iron level.

Murvadya Choorna Vati^[13]

Murvadya Choorna Vati is mentioned in *Gada Nigraha* in *Pandu Adhyaya*. Its contents are *Murva (Marsdenia tenacissima)*, *Bala (Sida cordifolia)* and *Chitrak (Plumbago zeylanica)*. Roots of *Murva*, *Bala* and *Chitrak* are taken in *Choorna* form and in equal amounts and are converted to tablet form for the convenience and proper dosage of the patients. All these drugs have a combined synergistic action.

1. *Murva*^[14]

- **Latin name** - *Marsdenia tenacissima*
- **Family** - Asclepiadeceae
- **Synonyms** - *Maruabel, Moravela, Tiktavalli, Jartor.*
- **Rasa** - *Tikta, Madhur, Kashaya*
- **Vipaka** - *Katu*
- **Veerya** - *Ushna*
- **Doshagnata** - *Tridosha shamak*
- **Rogagnata** - *Murva* is useful in *Kapha, Vata* and *Paitik Vikaras* also. It is used in *Twaka Vikara, Aamdosha, Amlapitta, Vibandha, Kamala, Shoola, Krimi, Hridaya Vikaras, Rakta Vikaras, Prameha, Kushtha, Vishama Jwara* etc.
- **Chemical constituents** - The bark of the shoots contains milky juice containing caoutchouc. The root and seed contain pregnane glycosides. The stem of the plant contains a glycoside called tenacissoides A-E. Apart from these the plant also contains Marsdenin, D – Cymarose, Asclepobiose, D – Canarose and Cissogen.^[15]

2. Bala^[16]**Latin name** - *Sida cordifolia***Family** - Malvaceae**Synonyms** - Country mallow, *Odanika, Bhadra, Samanga, Bariyar, Vatyalika, Kharyashtika*, etc.**Rasa** - Madhura**Vipaka** - Madhura**Veerya** - Sheeta**Doshagnata** - Vata Pittaghna**Rogagnata** - Bala is useful in Vata and Pitta Vikaras. It is used in *Vranashoth, Netraroga, Pakshaghat, Ardita, Grahani, Raktapitta*.**Chemical constituents** - Asparagin, alkaloids (hypaphorine, ephedrine and vasicine), phytosterols, mucin, gelatin, resin and potassium nitrate. Rutin has been reported.^[17]**3. Chitrak^[18]****Latin name** - *Plumbago zeylanica***Family** - Plumbagenaceae**Synonyms** - *Chita, Agni, Agnimali, Aruna, Dahana, Daruna*, etc.**Rasa** - Katu**Vipaka** - Katu**Veerya** - Ushna**Rogagnata** - *Kapha-Vata Janyavikara, Shlipada, Shotha, Nadi Daurbalya, Vatavyadhi, Agnimandya, Ajirna, Udarashoola*. It is abortifacient. It vitiates Pitta and reduces oedema, so it is useful in oedema, liver and spleen disorders.**Chemical constituents** - Pungent, having yellow and irritant principle called as plumbagin, 91%. It is soluble in alcohol and ether.^[19]**MATERIALS AND METHODS****Place of work** - Screening and selection of patients done in *Kayachikitsa* OPD and IPD.1. Follow up of each patient was taken on 15th day, 30th day and 45th day.

2. Observations were carried out as well as noted on each follow up

Selection Criteria**Inclusion Criteria**

- Pandu Vyadhi* was diagnosed according to subjective & objective parameters.
- Age: 18-60 Yrs. Irrespective of gender, religion, socio - economic status, marital status
- Hb % more than 8 gm% & less than normal i.e., Male - < 13g/dl, Female - < 12g/dl

Exclusion Criteria

- Endocrine disorders like hypothyroidism, Cushing syndrome, etc.
- Pregnant and lactating lady.
- Patient having tuberculosis, known case of HIV, leprosy, any type of Cancer.
- Patients showing signs and symptoms of internal bleeding, hemorrhoids, menorrhagia or any other bleeding disorder. (Worms, scurvy, puerperal etc.)

Withdrawal Criteria

- If patient develops any adverse effect.
- If not responding to treatment and aggravation of symptoms.
- Patient refused to continue treatment.
- In this clinical study no patient developed any adverse effect.
- Patients' withdrawal from the study was due to failure to give follow up.

Table 1: Cardinal sign assessment of Pandu Vyadhi

SN	Lakshanas	Mild+	Moderate++	Severe+++
1.	<i>Panduta (Netra, Nakha, Jivha,)</i>	<i>Panduta</i> seen at <i>Netra</i>	<i>Panduta</i> present at <i>Netra, Nakha.</i>	<i>Panduta</i> present at <i>Netra, Nakha, Jivha.</i>
2.	<i>Hridspandan</i>	Palpitation after	Palpitation on mild Exertion	Palpitation at rest

		moderate exertion		
3.	Akshikoota Shotha	Present	Present	Absent

S.O.P. (Standard Operating Procedure) for Murvadya Choorna Vati

1. Authentication and standardisation of all the drugs was done.
2. Drugs mentioned in the above yoga were cleaned and dried properly.
3. They were powdered using disintegrator and mixed with each other in equal quantity.
4. This powder was shifted to drier for drying; after sufficient drying, granulation process was carried out.
5. Finally, 500 mg tablets were prepared by using Rotary tablet machine for the convenience and proper dosage.
6. Pack of 30 tablets was prepared.

Drug Administration

Murvadya Choorna Vati - Dose	2gm (twice a day)
Route	Oral
Kala	Vyanodana
Anupana	Koshna Jala
Duration	45 Days
Follow up	15 th day, 30 th day and 45 th day

OBSERVATION AND RESULTS

Effect of treatment on Panduta at Netra

Table 2: The frequency distribution of Panduta at Netra is given below.

Netra Panduta	BT		AT	
	Frequency	Percentage	Frequency	Percentage
Grade 0	0	0.0	2	6.7
Grade 1	2	6.7	28	93.3
Grade 2	17	56.7	0	0.0

Grade 3	11	36.7	0	0.0
Total	30	100.0	30	100.0

Table 3: Effect of treatment on Panduta at Nakha.

The frequency distribution of Panduta at Nakha is given below.

Netra Panduta	BT		AT	
	Frequency	Percentage	Frequency	Percentage
Grade 0	0	0.0	7	23.3
Grade 1	4	13.3	23	76.7
Grade 2	16	53.3	0	0.0
Grade 3	10	33.3	0	0.0
Total	30	100.0	30	100.0

Table 4: Effect of treatment on Panduta at Jivha.

The frequency distribution of Panduta at Jivha is given below.

Jivha Panduta	BT		AT	
	Frequency	Percentage	Frequency	Percentage
Grade 0	0	0.0	14	46.7
Grade 1	6	20.0	16	53.3
Grade 2	21	70.0	0	0.0
Grade 3	3	10.0	0	0.0
Total	30	100.0	30	100.0

Table 5: Effect on Hridspandan.

The frequency distribution of Hridspandan along with graph is given below.

Hridspandana	BT		AT	
	Frequency	Percentage	Frequency	Percentage
Grade 0	1	3.3	9	30.0

Grade 1	6	20.0	21	70.0
Grade 2	15	50.0	0	0.0
Grade 3	8	26.7	0	0.0
Total	30	100.0	30	100.0

Table 6: Effect on Akshikoota Shotha.

The frequency distribution of Akshikoota Shotha along with graph is given below.

Akshikutshot ha	BT		AT	
	Frequen cy	Percenta ge	Frequen cy	Percenta ge
Grade 0	2	6.7	17	56.7
Grade 1	28	93.3	13	43.3
Grade 2	0	0.0	0	0.0
Grade 3	0	0.0	0	0.0
Total	30	100.0	30	100.0

Table 7: Effect on Sr. Iron Level.

The frequency distribution of Sr. Iron along with graph is given below.

Sr. Iron	Count	Percentage (%)
Increased	19	63.3
No Change	2	6.7
Decreased	9	30

Using paired t test, p-value is less than 0.05. Hence, we concluded that the effect of *Murvadya Choorna Vati* is significantly effective in Sr. Iron Level. Average Sr. Iron Level value is increased from 33.20 to 42.63 after 45 days of treatment.

Table 8: Effect on Sr. Iron Level

Sr. Iron Level	Mean	N	SD	SE	t-Value	P-Value	% Change	Result
BT	33.20	30	17.49	3.19	-2.147	0.040	28.4	Sig
AT	42.63	30	24.51	4.48				

There is significant statistical difference in Sr. Iron Level before and after treatment in experimental group. Sr. Iron Level has significantly increased after 45 days of treatment.

Table 9: Effect on Hb%

The frequency distribution of Hb% along with graph is given below.

Hb%	Count	Percentage (%)
Increased	21	70
No change	9	30
Decreased	0	0

Haemoglobin count calculated in all patients is reported as following -

When it is represented graphically, it is clear, that, Hb% has significantly increased in 70% of patients, decreased in 30% of patients, while it remains unchanged in 0% patients.

Using paired t test, p-value is greater than 0.05. Hence, we concluded that the effect of *Murvadya Choorna Vati* is non-significant in RBC Count. Average RBC Count value is increased from 4.47 to 4.64 after 45 days of treatment.

Table 10: Effect on RBC count

RBC count	Mean	N	SD	SE	t-Value	P-Value	% Change	Result
BT	4.47	29	0.38	0.07	-1.884	0.070	3.9	NS
AT	4.64	29	0.49	0.09				

There is no significant statistical difference in RBC Count before and after treatment in experimental group. RBC Count has not significantly increased after 45 days of treatment.

DISCUSSION

Iron deficiency is one of the most important types of anaemia. On an average, globally, 50% of the anaemia is credited to Iron deficiency. In developing countries

like India 30% to 70% of the population is iron deficient. Dietary insufficiency, hookworm infestation and lack of food fortification leads to wide prevalence of iron deficiency anaemia in infants, children and women.^[20]

The world's population is increasing at a rapid rate, with the result most of the people are living in unhygienic, under-nourishing conditions and facing various effects of stress and strain factor. Iron deficiency anaemia is a burning issue globally. In the modern science, there is good treatment for acute Anemia with considerable result but no significant therapy is there for chronic Anemias which occurs due to metabolic defects. Ayurveda can provide better management of this disease. Hence, "An open label single arm study to evaluate the efficacy of *Murvadya Choorna Vati* in *Pandu Vyadhi* with special reference to Iron Deficiency Anaemia" was selected.

Total 30 patients were selected for the clinical trials. They were treated with *Murvadya Choorna Vati* 1gm B.D. with *Koshna Jala*. The patients were evaluated for 45 days. Their symptoms, clinical presentation and laboratory findings were observed and recorded before and after the treatment. These findings were assessed on the basis of scores which were given before and after treatment of 45 days.

In this study, 33% of patients are reported in *Vegodharan*, 27% of patients reported *Atishrama*, 20% patients reported both *Atishrama* and *Vegodharan*, while remaining 20% patients reported both *Atishrama* and *Atapseva*. All these *Viharatmak hetus* are equally responsible for *Pandu Vyadhi*.

Out of 30 patients, 6 patients had complained of *Asamyak Malapravrutti* before starting treatment. During treatment, this symptom was relieved in all the 6 patients. This is an additional observation noted during study. But as effect on *Malapravrutti* wasn't the subjective or objective criteria of this study, it wasn't further evaluated.

Effect on Hb%

As P-value is measured for each criterion, it is evident that –

There is statistically significant increase in Hb%. Among the 30 patients included in the study, 21 patients i.e.,

70% have increased Hb% while remaining 9 patients i.e., 30% have decreased Hb% after 45 days of treatment. Statistically it is proved that *Murvadya Choorna Vati* is significantly effective in Hb%. Besides these statistical values, clinical improvement has been seen in each of the patients. The quality of life has certainly improved after the use of *Murvadya Choorna Vati* for 45 days.

Sr. Iron Levels

Among the 30 patients, 19 patients i.e., 63.3% showed increase in Sr. Iron Levels, 9 patients i.e., 30% showed decrease while remaining 2 patients i.e., 6.7% showed no change in its value.

From the above findings, we concluded that there is statically significant effect of *Murvadya Choorna Vati* on Sr. Iron Levels after 45 days of treatment.

As the drug doesn't have any content which directly increase the Sr. Iron level, it could be helping in increasing the absorption of iron from the diet in the body.

Probable Mode of Action of Murvadya Choorna Vati

Murva being *Tikta Rasatmaka*, *Ushna Veerya* and *Katu Vipaka*, it works as *Agnideepana* which leads to *Aampachana*. Also, *Tikta Rasa* causes *Dhatvagni Deepana* which helps in healthy *Rasa Dhatu* formation. Healthy *Rasa Dhatu* and *Dhatvagni Deepana* eventually leads to better *Dhatu Poshana* and healthy *Uttarottar Dhatus Nirmiti*. This, helps in healthy *Oja Dhatu* formation. As *Oja* is the *Saar* of all *Dhatus*, it controls the functions of all *Dhatus* and maintains their performance.^[21]

Murva has *Sarak* property. This *Guna* of *Murva* helps in relieving *Asamyak Malapravrutti* and carrying out *Malanulomana Karma*. Also, this *Sarak Guna* helps in removal of *Dushit Pitta* from the body thus, causing *Deepana and Pachana* which in turn increases the absorption of *Ahara rasa* in the body. Thus, it might be helpful in increasing the absorption of iron in the body.

Murva being *Kashaya Rasatmaka*, *Ushna Veerya* and *Ruksha Guna* causes *Kleda Nashan*. This helps in removing the *Avrodha* of the *Strotasas*, thereby

helping in relieving from *Dhatu Shaithilya*. Thus, leading to *Uttam Dhatu Poshana* and healthy *Dhatu* formation. *Kashaya Rasa* of *Murva* also helps in mitigating *Pitta Dosha* and is *Rakta Dushtihara*.^[22]

CONCLUSION

It is concluded that *Murvadya Choorna Vati* shows significant results in reducing the symptoms of *Pandu Vyadhi*. Finally, it is concluded that there is statically significant effect of *Murvadya Choorna Vati* on Sr. Iron Levels Haemoglobin.

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