

A comparative clinical study of Mandoorbhasma with & without Guduchi Ghana in Pandu with special reference to iron deficiency Anaemia

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Abstract

Panduroga is a *Rasapradoshaja*, *pitta pradhana vyadhi* which can be correlated with Iron deficiency anemia. It is the commonest nutritional deficiency disorders present throughout the world and its prevalence is higher in developing countries like India. A comparative study conducted to assess the efficacy of *Mandoorbhasma* and to compare the efficacy of *Mandoorbhasma* with and without *Guduchi Ghana* in Pandu. Total 40 patients were divided into two equal groups. Group A patients were given *Mandoorbhasma* 250mg two times a day and group B patients were treated with *Mandoorbhasma* 250mg along with *Guduchi Ghana* 500mg two times a day with water for 30 days. Subjective and Objective parameters were assessed before and after treatment. The significant improvement was observed in both Groups. Group B showed more improvement in all parameters than group A. So it can be concluded that *Mandoorbhasma* with *Guduchi Ghana* is effective in the management of *Pandu*.

Keywords: *Pandu*, iron deficiency Anaemia, *Mandoorbhasma*, *Guduchi*, haemoglobin

Introduction

According to *Ayurveda*, the body comprises of seven *Dhatus* (bodily tissues) which are responsible for maintenance of good health. Amongst them the first *Dhatu Rasa* is the most important as all others are formed from it. Any imbalance in *Rasa Dhatu* leads to imbalance in all other *Dhatus*. *Agni* plays an important role in proper functioning of all *dhatu*. *Rasa Dhatu* gives nourishment to *Rakta Dhatu* [1]. In *Ayurvedic* Classics *Rakta* has been considered as key factor for *Jeevan*, *Prinan*, *Dharana*, & *Poshana Karma* of the Body. [2, 3]

Panduroga is a *Rasapradoshaja* and *Pitta pradhana vyadhi* in which *Rasa* and *Rakta dhatu* are mainly affected. *Sthanasamshraya* (localization) of these vitiated *doshas* occur in between *Twak* (skin) and *Mamsa* (muscle tissue) resulting in *Pandu* [4], *Harita* and *Haridra Varna* to the skin. Hence, the disease is named as *Pandu Roga*. [5]

According to *Acharya Charak Mandagni* (diminished digestive fire) is the main cause of *Panduroga*. [6] *Panduta* that is pallor is the main characteristic of this *Vyadhi*. Due to resemblance of symptoms, it can be correlated with 'Anaemia' of modern science. [7] Anaemia is a condition in which there is a reduction in the number of RBCs per cu mm of blood and decreased concentration of Hb% in RBCs. Reduction in Hb% decreases oxygen carrying capacity of blood to all the tissues, resulting in paleness and other symptoms. Commonly, it results from a dietary deficiency of iron. Anaemia leads to weakened immunity, reduced work capacity, reduced cognitive ability and overall decreased quality of life. [8]

According to the World Health Organization (WHO), there are two billion people with Anaemia in the world and half of the Anaemia is due to iron deficiency. The estimated

prevalence of Anaemia in developing countries is 42% in women of age 15–59 years, 30% in men of age group 15–59 years. [9, 10]

In *Ayurveda* various herbo mineral formulations are described for management of *Pandu*. *Ayurvedic Chikitsa* gives emphasize on proper functioning of "Agni" which is very important for proper digestion, absorption and assimilation of nutrients to meet the demand of the body, instead of giving importance to only iron preparation. *Mandoor*, and mineral preparation is used in the form of purified *Bhasma*. It is easily absorbed due to its nano particulate size. It is *Sheeta*, *Aganideepak*, *Pittashamak* and *Uttam Raktavidhikar*. [11]

In *Bhavaprakash Guduchi* (*Tinospora cordifolia*) is mentioned for the treatment of *Pandu*. *Guduchi* is having *Tikta*, *Katu* & *Kashaya Rasa*, *Ushna Virya*, *Madhur Vipaka*, *Ruksha*, *Laghu*, *Mrudu Guna* and *Deepan*, *Pachan* properties. *Guduchi* is *Tridoshshamak*, *Agnivardhaka* and *Rasayan* hence it can be used in *Pandu*. [12]

Rationale of study

Anaemia is a global public health problem having major consequences on human health if not treated properly. The prevalence of Anaemia is increasing day by day due to changing lifestyle, use of fast food and unhealthy dietary habits. Excessive use of pesticides and fertilizers decreases the percentage of the nutritional value of vegetables and fruits. Poverty, illiteracy and lack of health services lead to improper nutrition, which causes various nutritional deficiency disorders like Iron deficiency Anaemia (*Panduroga*). [13]

Hence this study was undertaken to assess and compare the efficacy of *Mandoorbhasma* with and without *Guduchi*

Ghana in *Pandu Roga* with special reference to Iron Deficiency Anaemia.

Aim: Assessment of efficacy of *Mandoorbhasma* with and without *Guduchi Ghana* in *Pandu* (Iron Deficiency Anaemia)

Objectives of study

1. To assess the efficacy of *Mandoorbhasma* on Hb%, RBC count, MCV, MCH and MCHC
2. To assess the efficacy of *Mandoorbhasma* with *Guduchi Ghana* on Hb%, RBC count, MCV, MCH and MCHC.
3. To compare the efficacy of *Mandoorbhasma* with and without *Guduchi Ghana* on Hb%, RBC count, MCV, MCH and MCHC.

Material and Methods

It was comparative open 1:1 allocation randomized clinical study. The study was started after taking approval from institutional ethical committee (vide reference no. DMIMS (DU)/ IEC/2015-16/3004. Informed consent was taken from each patient participating in the study.

The patients were randomly selected from OPD & IPD of *Kayachikitsa* Department of Hospital attached to academic centre, fulfilling the inclusion criteria.

Pharmaceutical source: *Mandoorbhasma* was procured from authentic source. Raw material *Guduchi* (*Tinospora cordifolia*) was procured from local market and was authenticated by Dravyaguna Department. After that *Guduchi Ghana Vati* was prepared in Dattatreya Pharmacy of MGAC. Single batch of drug was used for study.

Preparation of *Guduchi Ghana Vati- Guduchi Ghana* was prepared according to procedure mentioned in Bhavprakasha.^[14]

Inclusion criteria

1. Patients having Hb% within the range of 8 to 11 gm/dl
2. Patients between age group of 18-60 years.
3. Patients of either sex.
4. Patients having classical signs and symptoms of *Pandu* given in Ayurvedic texts

Exclusion criteria

1. Patients suffering from sickle cell anemia, pernicious Anaemia, Aplastic anaemia, Leukaemia
2. Patients suffering from cardiovascular and renal disorders
3. Patients suffering from bleeding disorders
4. Pregnant and lactating women

Methodology

Total 40 patients were registered and randomly divided into two equal groups, consisting 20 patients each. All 40 patients had completed the treatment. Sample size was taken 40 as it is a piloting study. Patients were enrolled and randomly divided in 2 equal groups and assigned to interventions by PI and CO- PI.

Locus of the study-Mahatma Gandhi Ayurved College Hospital and Research Centre, Salod (H), Wardha

Type of Study: Interventional parallel study

Study design: Randomized open reference standard controlled clinical study.

Allocation ratio-1:1

Sample size -40

Sampling procedure: Computerized Randomized chart

Grouping -Two groups, 20 patients in each group

Group A-Treated with *Mandoorbhasma*

Group B-Treated with *Mandoorbhasma* with *Guduchi Ghana*

Posology

Mandoorbhasma 250mg two times a day

Guduchi Ghana vati 500mg two times a day

Mode of administration -Orally

Anupan - Koshna jala

Duration - 30 days

Follow Up-on 15th and 30th day of treatment.

Investigations

Complete Blood Count

Case record form was prepared and validated by experts. Record and follow up of all patients included in the study was documented and maintained. Statistical analysis was done by using descriptive and inferential statistics using student's paired t-test.

Outcome-Criteria for Assessment-

Subjective Criteria—Patients were assessed on day 0, 15 and 30 for subjective criteria.

1. *Pandutva* of *Tvaka, Nakha, Netravartma, Jihva, Hastapadatala* (Pallor)
2. *Daurbalya* (Generalized weakness)
3. *Shoth* (Oedema)
4. *Agnimandya* (Loss of Appetite)

Severity of disease was assessed by Gradation of each criteria. Gradation was shown in Table no.1

Table 1: "Gradation of Subjective parameters"

SN	Subjective parameters	Gr 0	Gr 1	Gr 2	Gr 3	Gr 4
1	<i>Pandutva</i> of <i>Tvaka, Nakha, Netravartma, Jihva, Hastapadatala</i> (Pallor)	Absent	In any 2 of these	In any 3 of these	In any 4 of these	In all
2	<i>Daurbalya</i> (Generalized weakness)	No <i>Daurbalya</i>	Not able to perform strenuous activity	Not able to perform moderate activity	Not able to perform mild activity	Feeling of weakness at rest
3	<i>Shoth</i> (Oedema)	No shoth	<i>Shoth</i> observed only on legs	<i>Shoth</i> observed on legs & face	<i>Shoth</i> observed all over body	-
4	<i>Agnimandya</i> (Loss of Appetite)	No <i>Agnimandya</i>	Delayed digestion of heavy meals	Delayed digestion of light meals	Cannot digest even light meals	-

Table 2: “Comparison of Subjective Parameters in both groups”

Sr no.	Subjective Parameter	Group A (n=20)		Group B (n=20)	
		BT	AT	BT	AT
1	<i>Pandutva</i>	20(100%)	8(40%)	20(100%)	13(65%)
2	<i>Daurbalyata</i>	20(100%)	10(50%)	19(95%)	13(65%)
3	<i>Shotha</i>	16(80%)	11(55%)	14(70%)	12(60%)
4	<i>Agnimandya</i>	20(100%)	13(65%)	19(100%)	18(94.73%)

Table 3: “Comparison of Objective Parameters in both groups”

CBC	Group	BT	AT	T	P
Hemoglobin	A	9.56±0.60	10.96±0.55	t=15.80	p=0.0001
	B	9.12±0.53	11.89±0.42	t=22.54	p=0.0001
MCV	A	69.85±6.06	76.70±4.64	t=7.65	p=0.000
	B	65.16±4.70	79.45±1.84	t=12.53	p=0.000
MCH	A	20.75±2.12	22.42±2.76	t=5.898	p=0.000
	B	22.31±2.75	25.91±3.28	t=9.83	p=0.000
MCHC	A	24.76±2.30	26.07±2.06	t=6.80	p=0.000
	B	27.68±2.57	30.24±1.95	t=7.34	p=0.000
RBC	A	3.03±0.45	3.58±0.49	t=9.00	p=0.0001
	B	3.46±0.58	4.10±0.58	t=5.13	p=0.0001

Table 4: “Percent wise (%) Improvement in subjective parameter”

Sr no.	Subjective parameter	Group A (n=20)		Group B (n=20)	
		BT	AT	BT	AT
1	<i>Pandutva</i>	20(100%)	8(40%)	20(100%)	13(65%)
2	<i>Daurbalyata</i>	20(100%)	10(50%)	19(95%)	13(65%)
3	<i>Shotha</i>	16(80%)	11(55%)	14(70%)	12(60%)
4	<i>Agnimandya</i>	20(100%)	13(65%)	19(100%)	18(94.73%)

Objective Criteria: Assessment of objective criteria was done on day 0, 15 and 30 on following parameters.

1. Haemoglobin (Hb %).
2. Red blood cell count (RBC)
3. Mean corpuscular volume (MCV)
4. Mean corpuscular Haemoglobin (MCH)
5. Mean corpuscular hemoglobin concentration (MCHC)

Results and Discussion

All the observations were recorded and data was collected before and after treatment. Then statistical analysis was done to reach the final results and conclusions.

Statistical analysis was done by using descriptive and inferential statistics using student's paired t-test and software used in the analysis were SPSS 16.0 version and Graph Pad Prism 6.0 version and $p < 0.05$ is considered as level of significance.

Demographic data showed that in this study maximum number of patients that is 22 (55.6%) were from age group between 21-30 years and 33 (82.5%) were female. Religion wise distribution showed that maximum number of patients 39 (97.5%) were Hindu and 32 (80%) patients belonged to middle class. 12 (30 %) patients were housewives and 24 (60.0%) belonged to urban area. This study showed that 29 (72.5%) patients were having mixed diet and 32(80.0%) were addicted to tea. In present study, 21 (52.5%) patients had *Vatapittaj* and 19 patients had *Pitta Kaphaj Prakriti*. The more incidence of *Pandu* was observed in *Pitta pradhan prakriti*. In Group A, complete improvement was observed in 8(40%) patients and in Group B complete improvement was observed in 13 (65.0%) patients after treatment which was significant. Both groups showed significant improvement in *Pandutva*. Comparison of both groups was

statistically significant as Group B was more effective than Group A shown in Table no. 2 and 4.

Pandutva is caused due to decrease in *Rakta dhatu* which is the main symptom of *Pandu*. *Mandoorbhasma* and *Guduchi* both help in correcting *Mandagni* and balances *Pitta* by their *Deepan, Pachan and Pitta shamak* properties. According to modern science *Panduta* is mainly due to less Haemoglobin concentration *Mandoor* is an iron preparation and *Raktavardhak* property of *Guduchi* help in increasing hemoglobin percentage.^[15,16] This may be the cause of reducing *Pandutva* in both groups. The probable cause for more improvement in Group B may be due to *Deepan, Amapachan, Yakrutottejak* and *Raktavardhak* properties of *Guduchi* which helps in *Poshana of Rasadi Dhatu* which increases the *Rakta Dhatu*.^[17, 18]

In Group A, complete improvement was observed in 10 (50.0%) patients after completion of treatment in *Daurbalya* which is significant and in Group B complete improvement was observed in 12 (60.0%) patients after treatment which is significant. Both groups showed significant improvement in *Daurbalya*. Comparison of both groups was statistically significant as Group B showed improvement in more number of patients than Group A shown in Table no. 2 and 4. *Dhatukshaya, Ojakshaya* and *Raktalpatha* causes *Daurbalya* in patients of *Pandu*. *Mandoorbhasma* and *Guduchi* Ghana corrects *Dhatukshaya* and *Raktalpatha* by their *Deepan Pachan, Rakta vardhak, Yakrutottejak* and *Rasayan* properties. Group B showed improvement in more number of patients than Group A which may be due to *Rasayan* and *Balya* properties of *Guduchi* given in Group B. In Group A, complete improvement was observed in 7 (35%) patients after completion of treatment in *Shoth* which is significant and in Group B complete improvement was observed in 12 (60%) patients after treatment. Comparison

of both groups was significant as Group B showed improvement in more number of patients than Group A in *Shoth* shown in Table no. 2 and 4. The probable cause for decrease in *Shoth* may be due to *Shothagna* and *Raktavardhan* properties of *Mandoorbhasma*. Both *Mandoorbhasma* and *Guduchi* balances vitiated *Doshas* and helps in reducing *Shoth*. Group B treated with *Mandoorbhasma* and *Guduchi Ghana vati* showed improvement in more number of patients than Group A treated with only *Mandoorbhasma*, which may be due to *Deepan*, *Yakrutottejak*, *mutral* (diuretic) and *shothgna* (anti inflammatory) properties of *Guduchi*. In Group A, complete improvement was observed in 13 (65.0%) patients after completion of treatment in *Agnimandya* which is significant and in Group B complete improvement was observed in 17 (85%) patients after completion of treatment in *Agnimandya*. Comparison of both groups was significant as Group B showed improvement in more number of patients than Group A in *Agnimandya* shown in Table no. 2 and 4. Both groups showed significant improvement in *Agnimandya* which may be due to *Deepan* and *Agnivardhana* properties of *Mandoorbhasma* and *Guduchi* which helps in correcting *Agnimandya*. Group B showed improvement in more number of patients than Group A, the probable cause may be due to *Deepan*, *Agnivardhana* and *Yakrutottejaka* properties of *Guduchi*. The mean increase in Haemoglobin after treatment was 1.40 with significant t and p value ($t=15.80$, $p=0.0001$) in Group A. The mean increase in Haemoglobin, MCV, MCH, MCHC and RBC after treatment was significant t and p value ($t=9.00$, $p=0.0001$) in both Groups as shown in Table no.3 A. Comparison of both groups was significant as increase was more in Group B than Group A as shown in Table no.3. Increase in Haemoglobin Percentage, MCV, MCH, MCHC and RBC in both groups may be due to *Raktavardhak* and *Agnideepak* property of *Guduchi* and *Mandoorbhasma*. *Mandoor* is an iron preparation which helps in increasing hemoglobin concentration and there by increases Haemoglobin percentage, MCV, MCH, MCHC and RBC. In Group B more improvement in Haemoglobin Percentage, MCV, MCH, MCHC and RBC than Group A was observed which may be due to *Raktavardhak*, *Agnideepak*, *Yakrutottejak* and *Rasayan* properties of *Guduchi* that causes *Poshan* of *Rasadi Dhatu* which increases *Rakta Dhatu*. Many research studies conducted on *Pandu* by using various formulations, which contain *Mandoorbhasma* and *Guduchi*, showed significant improvement in various parameters of *Pandu*. Thus they proved the efficacy of *Mandoorbhasma* and *Guduchi* in *Pandu*. M N Shaikh *et al.* conducted a comparative study on V.K. Tablet and *Dhatri Lauha* showed highly significant improvement in both groups but they found V.K. Tablet more effective than *Dhatri Lauha*. *Guduchi* is one of the ingredients of V.K tablet which has *Rasayan*, *Deepan*, and *Agnivadhaka* property. As the *Pandu* is *Rasapradoshaja* and *Apatarpanotha Vikara dhatu Poshan* and *Rasayan* property of *Guduchi* may help in the management of *Pandu* by enhancing the quality and quantity of *Rasa*, *Rakta Dhatu*.^[19] Meghali gupta *et al.* (2014) conducted a comparative study of *Dhatri Lauha* and *Darvyadi Lauha* concluded that both drugs are effective in reducing symptoms of *Pandu* but comparison showed *Darvyadi Lauha* more effective. *Guduchi* is one of the contents of *Dhatri Lauha* which may helps in reducing symptoms of *Pandu* by its *Deepan*, *Agnivardhana*,

Rasayana and *Raktavardhaka* properties.^[20] Madhuri G Vyas *et.al.*, conducted a comparative study on *Hansa Mandura* and *Phalatrikadi Kwatha* showed highly significant improvement in both groups. *Mandura* is one of the contents of *Hansa Mandura* and *Guduchi* is one of the ingredients of *Phalatrikadi Kwatha* which helps in breaking *Samprapti* and reducing symptoms of *Pandu*, but they found *Hansa Mandura* more effective than *Phalatrikadi Kwatha* which may be due to iron content of *Mandoorbhasma*.^[21] Probable Mode of Action of *Mandoorbhasma Mandoor* is an iron containing mineral preparation used in the form of purified *Bhasma*. It gets easily absorbed due to its nano particulate size *Mandoor* has *Kashaya Rasa*, *Ruksha Laghu Guna*, *Sheet Virya*, and *Katu Vipak*. It has *Pitta Shamak*, *Deepan* and *Rakta Vardhak* properties. *Pandu* is mainly cause due to *Mandagni* and aggravation of *Pitta* which lead to *Dushti* of *Rasa* and *Rakta dhatu*. *Raktalpatha* is mainly found in *Pandu*. Due to *Deepan* property *Mandoorbhasma* causes *Agnideepan* and *Pittashamak* property alleviates *Pitta Dosh*. *Balya* property of *Mandoorbhasma* helps in *Poshan* of *Rasa Raktadi Dhatu* which corrects *Panduta* and *Daurbalya*. *Raktavardhak* property helps in increasing *Rakta dhatu*.^[22] *Shothagna* property of *Mandoorbhasma* helps in reducing *Shoth*. Iron content in *Mandoorbhasma* helps in increasing haemoglobin concentration and there by corrects *Raktalpatha*.^[23]

Probable Mode of Action of *Guduchi*

Guduchi has *Tikta Katu Rasa*, *Laghu Snigdha Guna*, *Usna Virya*, *Madhur Vipak*, It has *Deepan*, *Amapachana*, *Agnivardhan* *Tridoshagna*, *Rasayan*, *Balya*, *Yakrutottejak*, and *Raktavardhak* properties. It has also anti oxidant, anti inflammatory, and Hepato protective properties. *Guduchi* contains Iron and Calcium. In *Pandu Mandagni* and aggravation of *Pitta* causes *Dushti* of *Rasa* and *Rakta Dhatu* which leads to *Raktalpatha*. *Guduchi* due to *Deepan* and *Amapachan* property helps in correcting the *Agnimandya* and balances *Doshas* by its *Tridosha Shamak* property which is the main causative factor for *Pandu*. *Rasayan*, *Balya* and *Yakrutottejak* properties of *Guduchi* helps in *Poshan* of *Rasadi Dhatu* which helps to correct in *Daurbalya*. *Raktavardhak* property helps in increasing *Rakta Dhatu* and corrects *Raktalpatha*. Iron content of *Guduchi* helps in increasing Haemoglobin percentage which helps to correct the *Pandutva*. *Shothagna* (anti inflammatory) properties of *Guduchi* in reducing *Shoth*.^[24]

Conclusion

Pandu can be correlated with Iron Deficiency Anaemia. Patients treated with *Mandoorbhasma* and *Guduchi Ghana Vati* showed significant improvement in all subjective and objective parameters. They can be used in increasing Hemoglobin percentage, MCV, MCH, MCHC, RBC level. Group B treated by *Mandoorbhasma* along with *Guduchi* showed better results than Group A treated only with *Mandoorbhasma*. From this study it can be concluded that *Mandoorbhasma* and *Guduchi Ghana Vati* both were effective in the management of *Pandu*. If *Mandoorbhasma* is given along with *Guduchi* it gives better results. Limitation-Sample size was small due to limited duration of study. Investigations like Serum Ferritin and Total Iron Binding Capacity not done.

Acknowledgement

I am thankful to all faculty members of Kayachikitsa department, Department of Rasashastra and Dattatreya Rasashala for their cooperation and guidance for completion of this research.

Conflict of Interest

None.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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