

A COMPARATIVE CLINICAL STUDY ON THE EFFECT OF SATAVARI MANDURA AND AMALAKI AVALEHA IN THE MANAGEMENT OF PANDU IN GARBHINI W.S.R TO ANAEMIA IN PREGNANCY

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ABSTRACT

India is one of the countries with high prevalence of anaemia during pregnancy. Anaemia is multifactorial. Iron deficiency anaemia is the most common conditions in a pregnant woman. As per *ayurvedic classics*, this condition occurs due to improper *Rasa Dhatu* in mother and continuously increasing fetal demands and is considered as *Rasa Pradoshajavikara*. A large number of *Lauha* preparations have been used widely for centuries to cure Anaemia.

Aim: To evaluate efficacy of *Shatavari Mandura* and *Amalaki Avaleha* on *Garbhini Pandu*.

Materials and Methods: A total 30 pregnant women with symptoms of *Garbhini Pandu* were randomly divided into three groups (A, B and C). In Group A *Satavari mandura*, 3gms in divided dose for the period of 30 days. In Group B *Amalaki avaleha* , 12 gms in divided dose for the period of 30 days. In Group C Ferrous sulphate in the dose of 200mg (containing 60mg of elemental iron) was administered once daily for the period of 30 days. Parameters of signs and symptoms & investigations was scored on the basis of standard method and was analysed statistically.

Results: The results revealed that overall clinical improvement was better in Group A when compared to Group B&C. Hemoglobin was increased in patients of Group A, which was statistically significant. No adverse drug reaction was observed during the treatment period.

Conclusion:

Shatavari Mandura is more effective on *Garbhini Pandu* in comparison to *Amalaki Avaleha*.

Keywords: Anaemia, *Shatavari Mandura* , *Garbhini Pandu*, *Amalaki Avaleha*.

INTRODUCTION: Pregnancy is a condition itself considered as precious. In this situation Pregnant women treated as very special. Diseases during pregnancy considered serious issue and needs immediate response, otherwise it gives adverse effect on both mother and fetus. where it has been estimated that 41.8% of pregnant women worldwide are anaemic¹. The majority (at least half) of this burden is due to iron deficiency². However, there is a significant variation in prevalence of anaemia,

both within and between countries. Because of physiological changes during pregnancy, pregnant women are at higher risk of anaemia and in particular iron deficiency anaemia, which is the most common type of anaemia during pregnancy. Hematological changes during pregnancy, especially expansion of blood volume, often confuse the diagnosis of anaemia and its treatment. Because of increased iron and folic acid demands during pregnancy, pregnant women are more susceptible to

develop anaemia. Moreover, pregnant women are more susceptible to the other types of anaemia that affect other women of childbearing age such as hereditary anaemia, sickle cell disease and aplastic anaemia³.

As per ayurvedic classics, this condition occurs due to improper *Rasa Dhatu* in mother and continuously increasing fetal demands and is considered as *Rasa Pradoshajavikara*⁴. A large number of *Lauha* preparations have been used widely for centuries to cure Anaemia. Acharya Charaka⁵ says that pregnant woman is to be treated cautiously as if one is walking with a pot full of oil in hand without letting a drop to fall. As vitiated doshas can result in various undesirable effect over herself and the growing fetus.

Eventhough in pandu roga the principle line of treatment is shodhana and shaman, shodhana is contraindicated

Garbhini should be treated like *annada*⁶. Our treatment should not harm the health of the *garbhini* as well as growing fetus. It should be *mrudu*, *madhura rasatmaka dravyas*. *Shaman chikitsa* is ideal while treating *garbhini pandu*. Hence shaman treatment has to be adopted.

The formation of *garbha* takes place with the combination of *Shadbhava*⁷. And the growth of the fetus is the result of *Ahara rasa* taken by the mother⁸. which does *Tarpana, Vardhana, Dharana karma*⁹. very important thing is *ahara rasa*¹⁰, which helps for the formation of *garbha* as well as growth of the fetus. Probably for this reason, the concept of *garbhini Paricharya*¹¹ in *Ayurveda* followed by all pregnant women is also an essential factor for the well being of both mother and fetus. It is confirmed by the *paricharya* of nine months of pregnancy that more em-

phasis is given on intake of *Madhura, Sheeta guna ahara*. All through pregnancy she is advised to consume milk and *ghee*. *Dravyas* which are from *madhura varga* are recommended during this period. *Brimhana* property of *Madhura*, *sheeta dravyas* gives good health benefits to the woman during pregnancy.

Ten properties of *Goksheera* has been given by *Acharya Charaka* which are same as properties of *Oja*. Modern science also says that the principle requirements of the fetus to grow are energy in the form of Lipids, carbohydrates, proteins, essential fatty acids, vitamins, inorganic elements and water. These all are exclusively present in the milk and *ghee*.

From forth month of pregnancy, *jangala mamsa rasa* is also added in the *Garbhini paricharya* which has properties like *madhura, kashaya rasa, sheeta virya* and *laghu guna*. It gives the *best Brimhana effect* to the body than other dietic factor.

Acharya Charaka has also mentioned as the fetus gets *bala varna upachaya* during 6th month¹² of pregnancy so naturally *Garbhini* shows symptoms like *bala varnahani*¹³, which further leads to *rakta and mamsa kshaya in garbhini*¹⁴ and according to *samprapti* of *pandu Roga*¹⁵, it leads to *Pandu-Roga*.

AIMS AND OBJECTIVES:

This chapter mentions the objectives of the study which are....

1. To carry out the study of *Garbhini Pandu*
2. To evaluate the efficacy of *satavari mandura in Garbhini Pandu*
3. To evaluate the efficacy of *Amalaki avaleha in Garbhini Pandu*.

MATERIALS AND METHODS

Method of collection of data:

Source of data: 30 Patients attending OPD & IPD of SDM Ayurveda Hospital, udupi fulfilling the inclusion and exclusion criteria of disease were selected for study

- Selected patients were attributed into 3 groups consisting of 10 patients each.
- A special Proforma was prepared with details of history taking, Physical signs and symptoms, lab investigation as mentioned in ayurvedic classics and allied sciences.
- Parameters of signs and symptoms & investigations was scored on the basis of standard method and was analysed statistically.

INCLUSION CRITERIA:

- Hb % between 8 to 10 Gm%
- Primi & multi gravida
- Patients within age group of 18 to 35 years.
- Patients in 2nd trimester of pregnancy.

EXCLUSION CRITERIA:

- Hb% below 8gm%
- Anaemia due to other pathology like Bleeding piles, APH, Nephritis, Multiple pregnancy etc
- Multiple pregnancy & pregnancy with complications like Pre-eclampsia, Toxaemia, Gestational diabetes.
- Systemic diseases such as Hypertension, Diabetes, Thalassemia, Sickle cell anaemia etc..

DESIGN OF THE STUDY:

- Group A was administered with *Satavari mandura*, 1tab in BD dose with milk for the period of 30 days.
- Group B was administered with *Amalaki avaleha* ,12 gms in BD dose with milk for the period of 30 days.
- Group C was administered with Ferrous sulphate in the dose of 200mg (containing 60mg of elemental iron) once daily for the period of 30 days.

FOLLOW UP PERIOD:

Two follow ups at an interval of one month from 6th month of gestation till the completion of 7th month.

Assessment criteria:

Shrama:(fatigue)

No fatigue	0
Fatigue after exertion	1
Fatigue after routine work	2
Fatigue even after rest	3

Balahani :(general weakness)

No weakness	0
Not affecting her daily work	1
Affecting her daily work	2
Decreasing her activities	3

Gurugatrata:(heaviness of body)

No heaviness	0
Not affecting her daily work	1
Affecting her daily work	2
Decreasing her activities	3

Paadashopha :(pedaloedema)

Noedema	0
Edema relieved on rest	1
Edema persists even after rest	2
Severe edema even after rest	3

Appetite :

Good	0
Moderate	1
Reduced	2

Giddiness :

No giddiness	0
Giddiness occasionally	1
Giddiness increases on walking/getting up	2

Persists	even	during	rest
			3

<i>Varnahaani</i> : pallor	None	0
Mild(conjunctiva	slightly	pale)
		1

Moderate(conjunctiva,	nail,	mucous
slightly)		2
Severe		3

Palpitation:

No palpitation	0	Pain during activity only	2
Only during activity	1	Pain even during rest	3
Severe during routine work	2	Objective Parameters: Pallor, Oedema of	
Even during rest	3	lower extremities, Blood investigations	
Pain in the lowerlimbs:		OBSERVATION AND RESULT:	
No pain	0	WITH IN THE GROUP:	
Pain not affecting routine work	1		

TABLE NO. 1 SHOWING EFFECT OF TREATMENT ON SHRAMA:

	N	BT Mean			Diff d	%	Paired t test				Significant
							SD	SEM	t	p	
A	10	1.8	AT 1	0.7	1.10	61.11	0.48	0.15	11.00	<0.0001	ES
			AT 2	0.0	1.80	100	0.0	0.0	13.50	<0.0001	ES
B	10	1.4	AT 1	0.8	0.60	42.85	0.63	0.20	3.674	0.0051	VS
			AT 2	0.3	1.10	78.57	0.48	0.15	6.128	0.0002	ES
C	10	1.6	AT 1	1.0	0.60	37.5	0.00	0.00	3.674	0.0051	VS
			AT 2	0.2	1.40	87.5	0.42	0.13	6.332	0.0001	ES

TABLE NO. 2 SHOWING EFFECT OF TREATMENT ON BALAHANI:

	N	BT Mean			Diff D	%	Paired t test				Significant
							SD	SEM	t	p	
A	10	1.5	AT 1	0.6	0.90	60	0.51	0.16	9.00	<0.0001	ES
			AT 2	0.0	1.50	100	0.0	0.0	9.00	<0.0001	ES
B	10	1.3	AT 1	0.6	0.70	53.84	0.69	0.22	4.583	0.0013	VS
			AT 2	0.4	0.90	69.23	0.51	0.16	5.014	0.0007	ES
C	10	1.4	AT 1	0.9	0.50	35.71	0.31	0.10	3.00	0.0150	S
			AT 2	0.5	0.90	64.28	0.52	0.16	5.014	0.0007	ES

TABLE NO. 3 SHOWING EFFECT OF TREATMENT ON GURUGATRATA:

	N	BT Mean			Diff d	%	Paired t test				Significant
							SD	SEM	t	P	
A	10	1.1	AT 1	0.5	0.60	54.54	0.52	0.16	3.674	0.0051	VS
			AT 2	0.0	1.10	100	0.00	0.00	3.973	0.0032	VS
B	10	0.8	AT 1	0.3	0.50	62.5	0.48	0.15	3.00	0.0150	S
			AT 2	0.1	0.70	87.5	0.31	0.10	4.583	0.0013	VS
C	10	1.1	AT 1	0.7	0.40	36.36	0.48	0.15	2.449	0.0368	S
			AT 2	0.3	0.80	72.72	0.48	0.15	4.00	0.0031	VS

TABLE NO.4 SHOWING EFFECT OF TREATMENT ON GIDDINESS:

Group	N	BT Mean			Diff D	%	Paired t test				Significant
							SD	SEM	T	P	
A	10	1.1	AT 1	0.2	0.90	81.81	0.42	0.13	9.00	<0.0001	ES
			AT 2	0.0	1.10	100	0.00	0.00	6.128	0.0002	ES

			2									
B	10	0.9	AT 1	0.6	0.30	33.33	0.69	0.22	1.406	0.1934	NS	
			AT 2	0.3	0.60	66.66	0.48	0.15	2.250	0.0510	NQS	
C	10	1.4	AT 1	0.8	0.60	57.14	0.42	0.13	3.674	0.0051	VS	
			AT 2	0.4	1.00	100	0.51	0.16	4.743	0.0011	VS	

TABLE NO.5 SHOWING EFFECT OF TREATMENT ON VARNAHANI:

Group	N	BT Mean		Diff D	%	Paired t test				Significant	
						SD	SEM	T	p		
A	10	1.0	AT 1	0.1	0.90	90	0.31	0.10	9.00	<0.0001	ES
			AT 2	0.0	1.00	100	0.00	0.00	1.00	<0.0001	ES
B	10	0.7	AT 1	0.2	0.50	71.42	0.42	0.13	3.00	0.0150	S
			AT 2	0.2	0.50	71.42	0.42	0.13	3.00	0.0150	S
C	10	1.1	AT 1	0.4	0.70	63.63	0.51	0.16	4.583	0.0013	VS
			AT 2	0.1	1.00	100	0.31	0.10	4.743	0.0011	VS

TABLE NO.6 SHOWING EFFECT OF TREATMENT ON APPETITE:

Group	N	BT Mean		Diff D	%	Paired t test				Significant	
						SD	SEM	t	P		
A	10	1.0	AT 1	0.1	0.90	90	0.31	0.10	9.00	<0.0001	ES
			AT 2	0.0	1.00	100	0.00	0.00	6.708	<0.0001	ES
B	10	0.5	AT 1	0.2	0.30	60	0.42	0.13	1.964	0.0811	NQS
			AT 2	0.1	0.40	80	0.31	0.10	1.809	0.1039	NS
C	10	1.0	AT 1	0.5	0.50	50	0.52	0.16	3.00	0.0150	S
			AT 2	0.4	0.60	60	0.51	0.16	3.67	0.0051	VS

TABLE NO. 7 SHOWING EFFECT OF TREATMENT ON PADASHOPHA:

Group	N	BT Mean		Diff D	%	Paired t test				Significant
						SD	SEM	t	P	

A	10	1.1	AT 1	0.3	0.80	72.72	0.48	0.15	6.00	0.0002	ES
			AT 2	0.0	1.10	100	0.00	0.00	4.71	0.0011	VS
B	10	0.8	AT 1	0.4	0.40	50	0.51	0.16	2.449	0.0368	S
			AT 2	0.0	0.80	100	0.00	0.00	2.753	0.0224	S
C	10	1.3	AT 1	0.6	0.70	53.84	0.51	0.16	4.583	0.0013	VS
			AT 2	0.2	1.10	100	0.42	0.13	6.128	0.0002	ES

TABLE NO.8 SHOWING EFFECT OF TREATMENT ON PALPITATION:

Group	N	BT Mean		Diff d	%	Paired t test				Significant	
						SD	SEM	T	p		
A	10	0.9	AT1	0.2	0.70	77.77	0.42	0.13	4.583	0.0013	VS
			AT2	0.0	0.90	100	0.00	0.00	3.857	0.0039	VS
B	10	0.2	AT1	0.1	0.10	50	0.31	0.10	1.000	0.3434	NS
			AT2	0.1	0.10	50	0.31	0.10	1.000	0.3434	NS
C	10	1.1	AT1	0.4	0.70	63.63	0.51	0.16	4.583	0.0013	VS
			AT2	0.2	0.90	81.81	0.42	0.13	3.857	0.0039	VS

TABLE NO.9 SHOWING EFFECT OF TREATMENT ON PAIN IN LOWER EXTREMITY:

Group	N	BT Mean		Diff D	%	Paired t test				Significant	
						SD	SEM	t	P		
A	10	0.6	AT1	0.5	0.10	16.66	0.52	0.16	1.00	0.3434	NS
			AT 2	0.0	0.60	100	0.00	0.00	3.674	0.0051	VS
B	10	0.7	AT 1	0.3	0.40	57.14	0.48	0.15	2.449	0.0368	S
			AT 2	0.0	0.70	100	0.00	0.00	4.583	0.0013	VS
C	10	0.8	AT 1	0.4	0.40	50	0.51	0.16	2.449	0.0368	S
			AT 2	0.0	0.80	100	0.00	0.00	6.000	0.0002	ES

TABLE NO. 10 SHOWING EFFECT OF TREATMENT ON Hb%:

Group	N	BT Mean		Diff D	%	Paired t test				Significant	
						SD	SEM	t	P		
A	10	0.09	AT1	0.11	-0.020	22.22	0.003	0.001	10.37	<0.0001	ES
B	10	0.09	AT1	0.10	-0.012	13.33	0.004	0.001	6.339	0.0001	ES
C	10	0.09	AT1	0.10	-0.010	11.11	0.005	0.001	6.442	0.0001	ES

DISCUSSION ON OBSERVATION AND EFFECT: Discussion is an essential

and most significant part of the research work done which helps to bring out the

specifics of the whole work carried out. With previous reports of Amalaki avaleha¹⁶ and ferrous sulphate both are effective in *Garbhini pandu*. to rule out the efficacy of *shatavari mandura* this comparative study was done. Under this part the data obtained all through the clinical study on the efficacy of *satavari mandura* and *amalaki avaleha* in *Garbhini Padu* carried out on 10 patients each group.

Clinical study was conducted on randomly selected 30 diagnosed patients of *Garbhini Pandu* fulfilling the inclusion criteria. *Satavari mandura* and *Amalaki avaleha* was administered in 10 patients each trial group and Heamatinics such as ferrous sulphate was administered in 10 patients of control group, for the period of two months in the second trimester of pregnancy. All haematological investigation were done before and after treatment.

Effect of treatment:

Effect of treatment was assessed both clinically as well as based on laboratory parameters. Clinical features and haemoglobin percentage were assessed before, after treatment and on follow up.

Effect of treatment on different symptoms of the disease:

Shrama: *shrama* was relieved after the treatment in both trial and control groups and was maintained on follow up. P value in both trial and control groups <0.0001 which shows that improvement was statistically significant.

The variation in three groups was statistically insignificant, but compared to group B and C, group A showed better result.

Balahani: *balahani* : was reduced in all three groups after the treatment and further improvement was seen after the follow up. P value <0.001 which shows that improvement was statistically significant.

Comparison between the three groups was statistically insignificant but group A showed better result compared to group B and C.

Gurugatrata: *Gurugatrata* was reduced in all three groups after the treatment and further improvement was seen after the follow up. P value <0.001 which shows that improvement was statistically significant.

Comparison between the three groups was statistically insignificant but group A showed better result compared to group B and C.

Giddiness: was reduced in two groups after the treatment and further improvement was seen after the follow up. P value <0.001 which shows that improvement was statistically significant. But in group B there was no relief in symptoms.

Comparison between the three groups was statistically insignificant. Action of both the medicine was sustained even during the period of follow up.

Varnahani: was reduced in all three groups after the treatment and further improvement was seen after the follow up. P value <0.001 which shows that improvement was statistically significant. After treatment improvement was more in group C and after follow up in group A

Comparison between the three groups was statistically insignificant but group A showed better result compared to group B and C.

Appetite: was reduced in all three groups after the treatment and further improvement was seen after the follow up. P value <0.001 which shows that improvement was statistically significant.

Comparison between the three groups was statistically insignificant but group A showed better result compared to group C.

Padashopha: was reduced in all three groups after the treatment and further improvement was seen after the follow up. P value <0.001 which shows that improvement was statistically significant.

Comparison between the three groups was statistically insignificant. The result was better in group A and B

Palpitation: was reduced in all three groups after the treatment and further improvement was seen after the follow up. P value <0.001 which shows that improvement was statistically significant.

Comparison between the three groups was statistically insignificant. Action of both the medicine was sustained even during the period of follow up.

Pain in lower extremity: Pain in lower extremity was reduced in all three groups after the treatment and further improvement was seen after the follow up. P value <0.001 which shows that improvement was statistically significant.

Comparison between the three groups was statistically insignificant but the effect of the treatment was maintained during the follow up in all the three groups.

HB%: after the treatment, 12% in group A, 11% in group B and C of Haemoglobin percentage was observed. Which was maintained during follow up. P value <0.001 which shows that improvement was statistically significant.

Comparison between the three groups was statistically significant but group A showed better result compared to group B and C.

Overall effect of medication on the features of pandu:

Observation after medication and follow up:

Satavari mandura is better compared to *Amalaki avaleha* in the following features:

- *Shrama*
- *balahani*
- *Varnahani*
- *Gurugatrata*
- Appetite
- Haemoglobin percentage

Overall results obtained in both trial and control groups:

• *Satavari mandura* showed better outcome in controlling the severity of the manifestation and is effective in reducing *Shrama, Balahani, Varnahani, Gurugatrata.*

• After the period of follow up, *Satavari mandura* was better in controlling the symptoms and also in maintaining the rate of improvement compared to *Amalaki avaleha* and Ferrous sulphate.

• In *Padashopha*, Pain in lower extremity, *Brama, Palpitation lakshanas of pandu roga, Amalaki avaleha* and Ferrous sulphate showed better response.

Probable mode of action of *satavari mandura*:

The drug *Satavari mandura* is mentioned in Bhaishajya Ratnavali and Rasa ratnakara¹⁷. The drug is prepared in the form of capsules, has *Satavari*¹⁸, *Amalaki*¹⁹, *Sweta Jeeraka*²⁰, *Dhanyaka*²¹, *Must*²², *Twak*²³, *Tejapatra*²⁴, *Ela*²⁵, *Haritaki*²⁶, *Pippali*²⁷, *Yastimadhu*²⁸, *Vamsalochana*²⁹, *Sunti*³⁰, *Draksha*³¹, *Madhu*³², *Mandura Basma*, *Godughdha*³³, *Godadhi*³⁴, *Goghrittha*³⁵. *Satavari mandura* contains iron along with other drugs, which possesses appetizing, digestive, restorative, and diuretic properties. The adjacent drugs might help in increased dietic intake due to enhanced appetite, better absorption of iron from the gut and its assimilation in the haemopoietic system. Thus summarizing, it can be said that iron contents in *satavari mandura* supplemented by adjuvant drugs cured

anaemia and gave relief in associated symptoms.

Most of the the ingredients of trial drugs have *madhura rasa* and *madhura vipaka* and *Having rasayana* property. which promotes the strength of *dhatu*, increases the *Bala* and nourishes the the body. *Katu rasa* increases the digestion by its *deepana, pachana* property. It does *srothoshodhana* which is very much essential in breaking the *samprapti of Pandu Roga*.

Piperine is the chemical constituents present in *pippali* which promotes intestinal absorption by activation of the γ -glutamyl transpeptidase. It acts as bioenhancer to vitamins (A,B1,B6,C,D,E,K), amino acids, minerals such as iodine, calcium, iron, zinc, copper, magnesium, potassium, manganese.

Further , Rutin a chemical present in *Satavari, pippali Dhanyaka* and essential oils of *dhanyaka* increases the absorption through the gut by increasing the metabolic activity. It stimulates the digestive enzymes of pancreas, enhances the digestive capacity and significantly reduces the gastrointestinal food transit time which is helpful for more amount of absorption of the nutrients through the gut. Rutin inhibits platelet aggregation, as well as decreases capillary permeability, making the blood thinner and improving circulation.

Samprapti vighatana by trial drugs:

Agnideepana- pippali, sweta-jeeraka,tejapatra

Amapachana-shunti, musta

Pittarechana- pippali, sweta-jeeraka,tejapatra, shunti, twak

Vatanulomana- haritaki, lauha, shunti

Srothoshodhana- pippali, shunti

Hrudhya- amalaki,satavari

Raktavardhaka- lauha, pippali,

Rasayana- satavari, amalaki, lauha

By the following action of drugs, it does *agni deepana, ama pachana, pitta rechana, vatanulomana, srothoshodhana and rasa rakta bala varna vardhana* by which the disease *pandu* can be cured.

CONCLUSION:

• *Satavari mandura* showed better outcome in controlling the severity of the manifestation and is effective in reducing *Shrama, Balahani, Varnahani, Gurugatrata*. After the period of follow up, *Satavari mandura* was better in controlling the symptoms and also in maintaining the rate of improvement compared to *Amalaki avaleha* and Ferrous sulphate .In *Padashopha*, Pain in lower extremity, *Brama, Palpitation lakshanas of pandu roga, Amalaki avaleha and Ferrous sulphate* showed better response.

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