



## Research Article

## MANAGEMENT OF *GARBHINI PANDU* WITH *DRAKSHA GHRITA* AND *LAKSHMANA LAUHA*: A COMPARATIVE CLINICAL STUDY

Vishwanath Tekam<sup>1\*</sup>, B. Pushpalatha<sup>2,3</sup>, K. Bharathi<sup>4</sup>, Sujata Kadam<sup>5</sup>

<sup>1</sup>PG Scholar, <sup>2</sup>Associate Professor, <sup>4</sup>Professor & HOD, PG. Department of Prasutitantra and Striroga, National Institute of Ayurveda, Madhav Vilas Palace, Amer Road, Jaipur, India.

<sup>3</sup>Ph.D Scholar, Tilak Maharashtra Vidyapeeth, Pune, Maharashtra, India.

<sup>5</sup>Professor, HOD & Dean, All India institute of Ayurveda, Gautampuri, Sarita vihar, New Delhi, India.

**KEYWORDS:** *Garbhini pandu*, Iron deficiency Anaemia, *Drakshadi ghrita*, *Lakshmana lauha*.

### ABSTRACT

Anaemia during pregnancy is a major public health problem throughout the world, particularly in the developing countries. According to WHO, prevalence of anaemia in pregnant women is estimated as 14 per cent in developed and 51 percent in developing countries. In India the prevalence is 65-75 percent. *Acharya Kashyapa* explained that like other disorders *Samprapti* of *Pandu* is also similar in *Garbhini*. So all narration mentioned in Ayurvedic classics regarding *Pandu* is applicable to *Garbhini- Pandu*. In the present study total 37 patients were recruited under the study and distributed into two groups Group-A (*Draksha ghrita*) and Group-B (*Lakshmana lauha*). After completion of trial 30 patients data was only available for assessment and 07 patients were dropped out from the study due to their irregular follow-up. On analysis of results, none of the patient has showed excellent relief. 10.00% and 30.00% patient has showed moderate relief in group A & B respectively. 06.00% and 10.00% patient in A and B group showed marked relief while 06.66% and 00.00% patient in has showed mild relief in A and B group and also the 26.66% and 16.66% patient has showed no relief. When the two groups A and B were compared with each other, the percentage of relief is found higher in group B, so it implies that group B is more clinically significant than group A. Overall conclusion of this study is that *Draksha Gritha* and *Lakshmana lauha* both drugs are effective, but *Lakshmana lauha* is comparatively better to cure the Subjective and Objective parameter of *Garbhini Pandu*.

### \*Address for correspondence

**Dr. Vishwanath Tekam**

PG Scholar,

PG. Department of

Prasutitantra and Striroga,

National Institute of Ayurveda,

Madhav Vilas Palace, Amer

Road, Jaipur, India.

Email: [dr.vishwa36@gmail.com](mailto:dr.vishwa36@gmail.com)

Phone: 9424407266

### INTRODUCTION

Anaemia during pregnancy is a major public health problem throughout the world, particularly in the developing countries. According to WHO, prevalence of anaemia in developed and developing countries in pregnant women is estimated at about 14 per cent in developed and 51 percent in developing countries. In India the prevalence is 65-75 percent. When compared to other developing countries, prevalence of anaemia in all the age groups is higher in India<sup>[1]</sup>. In South Asian countries, India contributes approximately 80 percent of the maternal deaths due to anaemia<sup>[2]</sup>. The Indian subcontinent alone contains nearly half of the

world's anaemic women<sup>[3]</sup>. Despite the fact that most of the anaemia that occur in pregnancy are largely preventable and easily treatable if detected in time, but still continues to be a common cause of mortality and morbidity in India. Anaemia is directly responsible for 20% maternal death and is an associated cause in another 20%<sup>[4]</sup>. Margaret Balfour was credited as the first to draw the attention of anaemia in pregnancy in India<sup>[5]</sup>. The Indian Council of Medical Research estimated the prevalence of anaemia among pregnant women to be 88%<sup>[6]</sup>. These affect approximately 2 billion people, 80% of whom live in the developing

countries<sup>[7]</sup>. WHO defines anaemia as presence of haemoglobin of less than 11g/dl and haematocrit of less than 0.33g/dl. According to a study by WHO on anaemia during 1993-2005, worldwide prevalence of anaemia was 25%. Iron containing drugs are widely used in modern medicine as haematinics. These drugs are known to induce some adverse drug reactions like gastro intestinal symptoms (nausea, vomiting, epigastric pain, eructation, colic pain, flatulence, constipation, black faeces, and diarrhea<sup>[8]</sup>). Hence it is the need to search some alternative form of other systems medicine. So we can try for safe, cheap, non-surgical and side effect free alternative. Ayurvedic management for the treatment of *Garbhini Pandu* with Ayurvedic preparations. *Draksha Ghrita* and *Lakshmana lauha* are selected for the study from *Chakradatta*<sup>[9]</sup> and *Bhaishajya ratnavali*<sup>[10]</sup> respectively. *Draksha Ghrita* consists of *Draksha* and *Ghrita* and *lakshmana lauha* consists of *Lakshmana* (*Swetakantakari*), *Ashoka*, *Kusha*, *Madhuka*, *Bala*, *Patha*, *Bilwa*, *Yastimadhu*, and *Lauha bhasma*.

*Acharya Kashyapa* explained that like other disorders *Pandu* is also common disease in *Garbhini*.<sup>[11]</sup> So all narration mentioned in Ayurvedic classics regarding *Pandu* is same as described in *Garbhini-Pandu*. In a nutshell, these different references regarding *Garbhini-Pandu* described in Ayurvedic text are given- *Garbhini Pandu* is exclusively described in *Vyakta Garbha Lakshanas*<sup>[12,13]</sup> *Garbhini Masanumasika lakshanas*<sup>[14]</sup>, *Raktagulma* context,<sup>[15]</sup> eight *Garbhopadravas*<sup>[16]</sup>, *Doshika Upavistaka Garbhini Lakshanas*<sup>[17]</sup>, and *Arista Lakshanas* of *Garbhini*<sup>[18]</sup>.

**Materials and Methods**

All the subjects are recruited from the OPD & IPD of Prasutitantra and Streeroga department, National Institute of Ayurveda, Jaipur as per the inclusion criteria and after obtaining the voluntary informed consent. Total 37 patients with confirmed diagnosis of *Garbhini pandu* were selected for the study, out of them 30 patients were completed the study and seven patients were dropped out.

**Inclusion Criteria**

A pregnant woman willing to participate in the trial.

**Drug intervention**

**Group A:** *Draksha ghrita* was given orally on empty stomach with *Ushna udaka*

S.No.	Group Name	Hb (gm %)	Dose	Duration
1.	Group-A	8-10 gm%	5gm.	3times/day

**Group B:** *Lakshmana lauha* form orally on empty stomach with *Sahapana Madhu*

S.No.	Group Name	Hb (gm %)	Dose	Duration
1.	Group-B	8-10 gm%	500mg.	3times/day

- A pregnant woman aged between 18-35 years of life.
- A pregnant woman having anaemia in second trimester.

**Exclusion Criteria**

- Anaemia other than Iron deficiency anaemia.
- Patients having Haemoglobin gm% less than 8.0gm/dl.
- Patients suffering from systemic diseases.
- 1st trimester of pregnancy.
- Patients suffering from pregnancy related complications such as- pregnancy induced hypertension (PIH), pre-eclampsia, hyperemesis gravidarum.

**Withdrawal Criteria**

The participant was withdrawn from the trial if

- During the course of clinical trial, if patient develops any serious adverse effect which requires urgent treatment.
- Non-compliance of trial.
- Patient will be excluded if she is irregular.

**Investigations**

Blood Examination- Haemoglobin, Total RBC, PCV, MCH, MCV, MCHC, All other routine Antenatal Care investigation were done.

**Design of study**

**Study Type:** Interventional

**Method adopted:** Randomized open labelled standard control trial

**Institutional Ethical Committee Clearance No. IEC/ACA/2017/42 and of date 25-27/04/2017**

**Purpose:** Treatment

**No. of Group:** Two

**No. of Patient's:** 30

**Duration of study and treatment period-** 3 months

**Follow-up period-** Patients were examined for the change in the signs and symptoms after every 15 days for a period of 3 months.

**Division in Groups**

**Group A-having 15 patients:** *Draksha ghrita*

**Group B -having 15 patients:** *Lakshmana lauha*

**Assessment Criteria****Subjective criteria**

- The improvement in the patient was assessed mainly on the basis of relief in the signs and symptoms of the disease.
- To assess the effect of therapy, all the signs and symptoms were given scoring depending upon their severity.
- Subjective symptoms were scored following the standard methods

**Table 1: Scoring pattern for sign & symptoms**

S.No.	Features	Grading	Score
1	Pallor ( <i>Panduta</i> )	G0- No pallor	0
		G1- Pallor restricting itself only to conjunctiva.	1
		G2- Pallor in conjunctiva, tongue and nails	2
		G3- Palmar crease and skin is also affected along with conjunctiva, tongue and nails.	3
2	Anorexia ( <i>Aruchi</i> )	G0- Normal appetite.	0
		G1- Unwilling to take food but eat.	1
		G2- Intake of food decreases.	2
		G3- No interest to intake food.	3
3	Indigestion ( <i>Avipaka</i> )	G0- No indigestion.	0
		G1- Occasionally present.	1
		G2- Present most of the time.	2
		G3- Always present.	3
4	Giddiness ( <i>Bhrama</i> )	G0- No Giddiness	0
		G1- Occasionally present	1
		G2- Present most of the time	2
		G3- Always present	3
5	Fatigueness ( <i>Shrama</i> )	G0- No fatigue	0
		G1- Fatigueness after excessive physical work.	1
		G2- Fatigueness on routine work	2
		G3- Fatigueness even on rest	3
6	Palpitation ( <i>Hrid-spandana</i> )	G0- No palpitation	0
		G1- Palpitation on excessive physical work	1
		G2- Palpitation on routine work	2
		G3- Palpitation on rest	3
7	Edema ( <i>Shotha</i> )	G0- No edema	0
8	Tinnitus ( <i>Karnak-shweda</i> )	G1- Edema in one particular region pedal edema, edema around eye ball, face	1
		G2- Edema more than two different sites	2
		G3- Generalized edema	3
		G0- No tinnitus	0
		G1- Occasionally present	1
		G2- Present most of the time	2
		G3- Always present	3

9	General-weakness ( <i>Daurbalya</i> )	G0- No General-weakness	0
		G1- General-weakness after excessive physical work.	1
		G2- General-weakness on routine work	2
		G3- General-weakness even on rest	3
10	Leg Cramps ( <i>Pindiko-dwestana</i> )	G0-No cramps	0
		G1- Cramps in legs occasionally	1
		G2- Present most of the time	2
		G3- Always present	3
11	Pica ( <i>Mrida-bhakshna</i> ) [Desire of non edible substances]	G0- No Pica	0
		G1- Occasionally	1
		G2- Frequently	2
		G3- Persistent desire	3
12	Exertional-dyspnoea ( <i>Shwasa</i> )	G0- Dyspnoea absent	0
		G1- Dyspnoea on excessive work	1
		G2- Dyspnoea on doing routine work	2
		G3- Dyspnoea on little physical work	3
13	Pain in upper & lower extremity ( <i>Kati-Pada-Uru- Ruk</i> )	G0- No pain	0
		G1- Pain in upper & lower extremity Occasionally	1
		G2- Pain present most of the time in upper & lower extremity	2
		G3-Always present	3

### Objective Parameters

For the purpose of diagnosis of a disease its assessment, severity and clinical improvement, certain routine and specific investigations were performed in every patients viz.

- Hemoglobin (Hb)
- Packed Cell Volume (PCV)
- Mean Corpuscular Volume (MCV)
- Mean Corpuscular Hemoglobin (MCH)
- Mean Corpuscular hemoglobin Concentration (MCHC)

### Criteria for the assessment of overall effect of the therapy

The total effect of treatment was assessed in the terms of cured, moderate improvement, mild improvement and no change.

**Table 2: Assessment Criteria of Overall Effect of Therapy**

No change	< 25% changes in the signs and symptoms
Mild improvement	26-50% changes in the signs and symptoms
Moderate improvement	51-75% relief in the signs and symptoms
Marked improvement	76-99% relief in the signs and symptoms
Complete cure	100% relief in the signs and symptoms

**Observations****Table 3: Age Wise Distribution of Patients of Garbhini Pandu (n=37)**

AGE (years)	No. of Patients		Total	%
	Group A	Group B		
18-23	07	08	15	40.54
24-29	10	09	19	51.35
30-35	01	02	3	08.11
<b>Total</b>	<b>18</b>	<b>19</b>	<b>37</b>	<b>100%</b>

Above table shows that the maximum incidence of *Garbhini-Pandu* i.e., 19 (51.35%) patients was found in age group ranging from 24-29 years followed by 15(40.54%) patients were from age group 18-23 years and 3 (08.11%) patients were from 30-35 years.

**Table 4: Religion Wise Distribution of Patients of Garbhini Pandu (n=37)**

Religion	No. of Patients		Total	Percentage
	Group A	Group B		
Hindu	12	9	21	56.76%
Muslim	6	10	16	43.24%
Other	00	00	00	00 %
<b>Total</b>	<b>18</b>	<b>19</b>	<b>37</b>	<b>100%</b>

Out of 37 patients 21 (56.76%) patients were from Hindu community and 16 (43.24%) from Muslim community.

**Table 5: Occupation of Patient-wise Distribution of Patients of Garbhini Pandu (n=37)**

Occupation	No. of Patients		Total	Percentage
	Group A	Group B		
Housewife	18	19	37	100%
Service class	00	00	00	00%
Labor class	00	00	00	00%
<b>Total</b>	<b>18</b>	<b>19</b>	<b>37</b>	<b>100%</b>

On considering the nature of occupation, it was found that 37(100%) patients were house-wife's, none of the patient belong to service-class group and labor class group.

**Table 6: Socio-economic Status Wise Distribution of Patients of Garbhini Pandu (n=37)**

Socioeconomic status	No. of Patients		Total	%
	Group A	Group B		
Poor	00	00	00	00%
Lower class	06	07	13	35.14%
Middle class	12	12	24	64.86%
<b>Total</b>	<b>18</b>	<b>19</b>	<b>37</b>	<b>100%</b>

This study revealed that the maximum number of patients i.e. 24 (64.86%) patients were belonging from middle class, whereas 13 (35.14%) patients belonging from Lower class.

**Table 7: Habitat wise distribution of patients of GarbhiniPandu (n=37)**

Habitat	No. of Patients		Total	%
	Group A	Group B		
Urban	18	18	36	97.30%
Rural	00	01	01	02.70%
<b>Total</b>	<b>18</b>	<b>19</b>	<b>37</b>	<b>100%</b>

On considering habitat wise distribution of patients, study reveals that maximum patients i.e. 36 (97.30%) patients were belonging from urban habitat, while 01 (02.70%) patients were belonging from rural area.

## RESULTS

**Table 8. Intergroup Comparison of Subjective Parameters**

To access the efficacy of two therapies intergroup comparison was done. As the variables are nonparametric we used Mann-Whitney Test for statistically analysis. The results are as follows

Variable	Mean Diff.		SD±		SE±		P	Result
	Group A	Group B	Group A	Group B	Group A	Group B		
Pallor	1.333	1.267	0.6172	0.4577	0.1594	0.1182	0.6577	NS
Anorexia	0.866	0.933	0.5164	0.4577	0.1333	0.1182	0.7150	NS
Digestion	1.000	1.067	0.5345	0.5936	0.1380	0.1533	0.7577	NS
Dizziness	0.933	1.067	0.4577	0.4577	0.1182	0.1182	0.4395	NS
Fatigue	0.333	1.267	2.637	0.4577	0.6808	0.1182	0.1106	NS
Palpitation	1.000	0.933	0.6547	0.5936	0.1690	0.1533	0.7901	NS
Edema	0.200	0.266	0.5606	0.4577	0.1447	0.1182	0.7953	NS
Tinnitus	0.333	0.133	0.488	0.3519	0.1260	0.0908	0.2132	NS
Weakness	0.400	0.733	0.5071	0.7988	0.1309	0.2063	0.2386	NS
Leg cramps	0.333	0.466	0.4880	0.6399	0.1260	0.1652	0.6400	NS
Pica	0.200	0.266	0.4140	0.4577	0.1069	0.1182	0.6920	NS
Dyspnea	0.533	0.533	0.5164	0.6399	0.1333	0.1652	0.8875	NS
Pain in upper and lower extremities	0.600	0.733	0.5071	0.7037	0.1309	0.1817	0.6907	NS

## Intergroup Comparison of Objective Parameters

The intergroup comparison of objective parameters of both group A and B, evaluated by the unpaired T -test and we found that, there is no statistical difference in the efficacy of both treatments

**Table 9: Intergroup Comparison of Therapy's Effect on Laboratory Investigation Score (Group- A n= 15, Group- B n= 15)**

Variable	Mean Diff.		SD±		SE±		T	P	Result
	Group A	Group B	Group A	Group B	Group A	Group B			
Hb Gm. %	-0.8267	-1.353	1.116	1.130	0.2881	0.2918	1.284	0.2095	NS
RBC'S (million)	-0.1780	-0.1780	0.3843	0.3843	0.0992	0.0992	0.000	>0.9999	NS
PCV in percentage	-0.6733	-0.1933	0.8311	0.5338	0.2146	0.1378	1.882	0.0703	NS
MCV (fl)	0.5400	0.2067	5.044	4.786	1.300	1.236	0.1857	0.8540	NS
MCH (pg)	0.3267	1.013	2.238	3.464	0.5780	0.8944	0.6448	0.5243	NS
MCHC (gm/dl)	-0.3000	-0.1867	1.541	1.002	0.3980	0.2587	0.2388	0.8130	NS

**Table 10: Distribution of Patient According to Relief in *Garbhini Pandu* (Group- A - n= 15, Group- B - n= 15)**

Relief	Group A		Group B		Total	
	Patient	Percentage (%)	Patient	Percentage (%)	Patient	Percentage (%)
No relief 09 to <10	08	26.66	5	16.66	13	43.33
Mild 10 To <11	02	06.66	00	00.00	02	06.66
Moderate 11 to < 12	03	10.00	06	20.00	09	30.00
Marked 12 to 13	02	06.00	03	10.00	06	16.00
Excellent > 13	00	00.00	00	00.00	00	00.00
Total	15					

## DISCUSSION

The present study is carried to evaluate two important Ayurvedic preparations *Drakshadi ghrita* and *Lakshmana lauha* in the management of *Garbhini Pandu* vis-à-vis Pregnancy Anemia. Total 37 patients recruited under the study and distributed into two groups Group-A (*Drakshadi ghrita* group) and Group-B (*Lakshmana lauha* group). After completion of trial 30 patients data only available for assessment and 07 patients were dropped out from the study due to their irregular follow-up.

### Demographic data

The maximum incidence of *Garbhini- Pandu* i.e., 19 (51.35%) patients was found in age group ranging from 24-29 years followed by 15 (40.54%) patients were from age group 18-23 years and 03 (08.11%) patients were from 30-35 years. Out of 37 patients 21 (56.76%) patients were from Hindu community and 16 (43.24%) from Muslim community. Prevalence of patients in this study shows that primary educated patients were maximum i.e. 15 (40.54%), followed by 13 (35.13%) patients were educated up to middle school. Whereas 01 (2.7%) patients were educated up to secondary. 04 (21.62%) patients were graduate educated. On considering the nature of occupation, it was found that 37 (100%) patients were house-wives; none of the patient belongs to service-class group and labor class group. The maximum number of patients i.e. 24 (64.86%) patients were belonging from middle class, whereas 13 (35.13%) patients belonging from Lower class. On considering habitat wise distribution of patients, study reveals that maximum patients i.e. 36 (97.29%) patients were belonging from urban habitat, while 01 (02.70%) patients were belonging from rural area. (Table: 07)

### Interpretation of Results

The assessment of the result was done by adopting method of scoring of sign and symptoms.

All the observations regarding the change in *Panduta* (Pallor), *Aruchi* (Anorexia), *Avipaka* (Indigestion), *Bharma* (Giddiness), *Sharma* (Fatigue), *Hrid-spandana* (Palpitation), *Shotha* (Edema), *Karna-Kshweda* (Tinnitus), *Daurbalya* (General weakness), *Pindikodwestana* (Leg-cramps), *Mrida-bhakshana* (Pica), *Shwasa* (Exertional- dyspnoea) and *Kati, Pada, Uru, Ruk* (Pain in upper & lower extremities) were assessed. Effects of both medicines were also assessed in haematological investigations and result was assessed statistically.

### Effect of Therapy on Subjective Criteria

**Effect on *Panduta* (pallor):** Percentage of relief was 71.39% and 90.5% in group A & Group B respectively in relieving *Panduta*, and statistically both groups are found extremely significant ( $P < 0.0001$ ).

**Effect on *Aruchi* (Anorexia):** Both groups were found extremely significant ( $P < 0.0002$ .) in reducing the *Aruchi* (Anorexia) symptom in patients. However, in percentage group- A showed better results (72.16%) in comparison to group-B (63.59%).

**Effect on *Avipaka* (Indigestion):** In both groups extremely significant relief ( $P < 0.0002$ ) found in giving relief from *Avipaka* (Indigestion) of patients. However, group-A showed better results (72.16 %) in comparison to group B (61.56%).

**Effect on *Dizziness Bhrama* (Giddiness):** In both groups, statistically significant ( $P < 0.0001$ ) relief observed in *Bhrama* (Giddiness) of patients. However, group B showed more results (66.6%) in comparison to groups A (58.31%).

**Effect on *Shrama* (Fatigue):** In Group B, 76.00% of relief found in *Shrama* (fatigue) was extremely significant ( $P < 0.0001$ ), whereas in group A 19.97% relief seen in *shrama* and was clinically significant. Hence it can be concluded that Group B showed better results in comparison to group A.

**Effect on Hrid- spandana (Palpitation):** In Group B 69.99% patients showed relief in *Hrid- spandana* and extremely significant ( $P < 0.000$ ) and in group A, 57.70% relief was found in *Hrid-spandana*. However, Group B showed more results in comparison to group A.

**Effect on Karna- Kshweda (Tinnitus):** In Group B (50.00%) relief in *Karna- Kshweda* was found not quite significant ( $P < 0.5000$ .) and in group A 45.42% patients are only have found relief in *Karna- Kshweda* and is not quite significant. So Group B is better than group-A, when compared both.

**Effect on Daurbalya (General weakness):** In Group B 61.08% relief found in relief of *Daurbalya* and is very significant ( $P < 0.0039$ ) and in Group A (50.00%) relief in *Daurbalya* is significant. However, Group B had shown more effect in comparison to Group A.

**Effect on Pindikodveshtana (Leg-cramps):** In Group B (63.57%) relief in *Pindikodveshtana* is significant and in Group A (45.42%) relief in *Pindikodvestana* is not quite significant. However, Group B showed more results in comparison to Group A.

**Mrid- bhakshana (Pica):** Both groups were clinically not significant in reducing *Mrida- bhakshana* (Goup A- 37.52% & Group B- 57.08%).

**Shvasa (Exertional dyspnoea):** In Group B (72.71%) relief in *Shwasa* is very significant and in group A (49.95%) relief in *Shwasa* is significant. However, Group B showed better results in comparison to group A.

**Kati, Pada, Uru, Ruk (Pain in upper & lower extremities):** In Group B (68.69%) relief in *Kati, Pada, Uru, Ruk* is very significant and in group A (56.23%) relief in *Kati, Pada, Uru, Ruk* is very significant. However, Group B showed more results in comparison to group A.

### Effect on Objective Parameters

#### Haemoglobin:

In Group B (14.47%) shown extremely significant result whereas in group A (8.76%) was significant. Group B shown better result than Group A.

In group A the percentage of relief was 8.762% and the effect of the therapy was significant at  $P < 0.05$ .

In group B the percentage of relief was 14.47% and the effect of the therapy was extremely significant at  $P < 0.01$ .

#### Red Blood Corpuscles

In Group A (4.8%) shows quite significant result and group B (1.35%) shows not significant.

In group A the percentage of relief was 4.896% and the effect of the therapy was not quite significant at  $P > 0.05$ .

In group B the percentage of relief was 1.352% and the effect of the therapy was not significant at  $P > 0.05$ .

#### Packed Cell Volume (PCV) in percentage

In Group A (2.2%) shows very significant result and in group B (0.5%) shows not significant.

In group A the percentage of relief was 2.260% and the effect of the therapy was very significant at  $P < 0.01$ .

In group B the percentage of relief was 0.585% and the effect of the therapy was not significant at  $P > 0.05$ .

#### Probable Mode of Action of Trial Drugs

##### Draksha ghrita

*Draksha ghrita* collectively has *Madhura, Tikta* and *Kashaya Rasa, Guru Snigdha, Mridu* and *Saumya Guna, Madhura Vipaka* and *Sheeta Veerya*. It has got *Vata-Pitta Shamaka* especially *Pitta-Shamaka* property. Because of the presence of *Ghrita* it also enhances or stimulates the digestive power and hence it cures *Agnimanda* due to *Agnivardhaka prabhava* of *Ghrita* and thereby helps in removal of *Srotavarodha*. *Draksha* have *Virechaka prabhava* due to which it also normalizes vitiated *Pitta dosha*.

*Pandu* though it is a *Tridoshaja* disease, but main *Dosha* taking part in *Samprapti* is *Pitta*. Due to *Vata-Pitta Samaka, agnivardhaka* properties, *Virechaka Guna, Draksha ghrita* pacifies *Pitta*, removes *Shrotovaigunya* and further helps in the optimum formation of *rasa* well as *Rakta dhatu* formation.

According to Ayurveda *Draksha* has got *Anulomana, Hridya, Jeevaniya, Balya, Brumhana, Mrudu rechaka* properties. Raisins contain calcium, magnesium, potassium, phosphorus and iron in an assimilable form besides gum and sugar. It is rich in anti-oxidants.

##### Lakshmana lauha

*Lakshamana Lauha* is having *Tridoshashamaka* as well as *Rakta-var dhaka, Agnidipaka*, and *Kriminashaka* property. *Pandu* is a disease that occurs due to *Agnimanda* (diminished metabolic fire) and *Stroto avrodha* (obstruction in the minute channels). *Bala, Yashtimadhu, Madhuka, Bilva, Lauha bhasma* and other ingredients present in *Lakshamana Lauha* are able to cause *Vighatana* of *Samprapti* of *Pandu* through their *Madhura, Tikta, Kashyarasa* properties and also Improves the formation of *Rakta dhatu*.



Good quality proteins play a significant role in iron absorption from the intestines, such as hepsidin, DMT-1, ceruloplasmin and are also helps in efflux of iron from enterocytes. Iron supplements require bioavailability enhancers to minimize the side effects. Herbo-mineral formulations can be used to reduce various side effects as the processing of various herbal juices with already processed and micro-fined minerals lead to the formation of herbo- mineral complexes. These complexes upon interaction with digestive juices adopt a colloidal form, for faster absorption. Sometimes they play a catalytic role facilitating absorption of other nutrients and correcting a disease process<sup>[19]</sup>.

The fraction of iron absorbed from the amount ingested is typically low, but may range from 5% to 35% depending on circumstances and type of iron<sup>[20]</sup>. The physical state of iron entering the duodenum greatly influences its absorption. At physiological pH, ferrous iron (Fe<sup>+2</sup>) is rapidly oxidized to the insoluble ferric (Fe<sup>+3</sup>) form. Gastric acid lowers the pH of the proximal part of the duodenum, and then reduces Fe<sup>+3</sup> in the intestinal lumen by ferric reductases, and thus allows the subsequent transport of Fe<sup>+2</sup> across the apical membrane of enterocytes. This enhances the solubility and uptake of ferric iron<sup>[21]</sup>. When gastric acid production is impaired, like in cases of *Pandu* (Anemia) *roga*, iron absorption is reduced substantially.

*Lakshmana Lauha* is a herbo-mineral drug, *Lauha* content and presence of other herbs like *Yashtimadhu*, *Bilva* may be forming herbo-mineral complexes and facilitating the absorption of iron. *Yashtimadhu* (*Glycyrrhiza glabra* L.) is *Rasayana* and active bio-availability enhancer<sup>[22]</sup>. The drug *Bilva* is having *Anulomana* (laxative) and anti-oxidant properties. The drug *Bala* present in this compound is also a *Rasayana* drug; hence it acts as tonic and helps in absorption and bio-availability of *Lauha* in the intestines and formation of *Rasa* as well as *Raktadhatus*.

Another ingredient present in this drug is *Bilva* (*Aegle marmelos* (Linn.) Correaex. Roxb). Its fruit is commonly used at house-hole level to prepare juice, *Sharbat*, jelly etc. It is used as medicine as well as a nutraceutical plant. It is having *Kashaya*, *Tikta rasa*, *Laghu*, *Ruksha guna*, *Ushna veerya*, *Katu vipaka*, and *Kapha*, *Vata shamaka* properties. It is having therapeutic properties like *Deepana*, *Pachana*, *Grahi*, *Shothahara*, *Krimighna*, *Mridurechana*, *Pittasaraka*, *Vedanasthapana*. In Ayurveda classics it is suggested to use in *Atisara*, *Pravahika*, *Vamana*, *Vataroga*, *Agnimandya*, *Grahani*, *Raktatisara*,

*Raktapravahika*, *Raktarsha*, *Vibandha*, *Kamala*, *Vishuchika*, *Madhumeha*, *Parshvashula* etc. It is found to have protein 1.8; fat 0.3; carbohydrates 31.8 and fibre 2.9g/100g; calcium 85.0; phosphorus 50.0, iron 0.6; thiamine 0.13; riboflavin 1.2, niacin 1.1, oxalic acid 18.7; and vitamin C 8.0mg/100gm; carotene 55micro grams/100g; and calorific value 137KCal/100g. *Mridurechana* and *Agnimandya* properties of this drug helps in pacifying *Pitta*.

*Yashtimadhu* is a good source of vitamin C; carotene, nicotinic acid, riboflavin. *Yashti* in association with *Bilva* through their Vitamin-C rich property helps in the absorption of iron in the intestines.

## CONCLUSION

Excellent relief was not found in both groups, moderate relief was seen in 10.00% of patient in group-A, and in 30.00% patients B. In group-A, 06.00% and 10.00% patients in group-B showed marked relief while 0.6.66% and 00.00% patients has showed mild relief in A and B group respectively. And in Group A 26.66% and in Group B 16.66% patient has showed no relief. When the two groups A and B were compared with each other, the percentage of relief is found higher in group B, so it implies that group B is more clinically significant than group A.

Overall conclusion of this is that *Draksha Gritha* and *Lakshmana lauha* both drugs are effective, but *Lakshmana lauha* is comparatively better to cure the Subjective and Objective parameter of *Garbhini Pandu*.

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