WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 10, Issue 4, 1191-1199. Research Article ISSN 2277– 7105

CLINICAL STUDY OF LAUH BHASMA IN THE MANAGEMENT OF PANDU W.S.R. TO IRON DEFICIENCY ANEMIA

Pratibha Sharma*[1], Pankaj Sharma[2] and Manisha Singla[3]

[1]Reader, Department of Rasa Shashtra and Bhaishajya Kalpana, Abhilashi Ayurvedic College and Research Institute and Hospital, The Chachiot, Distt Mandi, Himachal Pradesh, India.

[2]Ayurvedic Practitioner at Ayurveda Healing Tree, Chandigarh, India.

[3]Ayurvedic Medical Officer, Government Ayurvedic Dispensary, Chamaru, Ghanaur, Patiala, Punjab, India.

Article Received on
21 Jan. 2021,

Revised on 11 Feb. 2021,
Accepted on 03 March 2021

DOI: 10.20959/wjpr20214-20036

***Corresponding Author**
Pratibha Sharma
Reader, Department of Rasa Shashtra and Bhaishajya Kalpana, Abhilashi Ayurvedic College and Research Institute and Hospital, The Chachiot, Distt Mandi, Himachal Pradesh, India.

ABSTRACT

Ayurveda is highly evolved and codified system of life and health science based on its own unique concepts and fundamental principles. *Rasashastra* is a branch of *Ayurveda* in which metals & minerals are converted into acceptable form, which includes *Bhasma*, *Kupipakva rasayana*, *Parpati kalpana* etc. for internal administration. Among all these formulation, Bhasma possesses unique properties of tastelessness, quick action, easy absorption, prolonged shelf life, wide range of therapeutic efficacy and *Rasayana* effects as well as also one of the earliest approaches of using nanoparticles for curing the disease. Ayurvedic literatures described the wide role of bhasma prepration in many disease, Pandu or Anemia is one of such disease. According to WHO, prevalence of Anemia in worldwide is 25% and among the various types of anemia, iron deficiency anemia is most common and more prevalent in Adolescents specially girls. As Iron being the best remedy for *Panduroga* w.s.r. to Iron Deficiency Anemia. *Ayurvedic* classics have recommended formulations of *Lauha*, Lauha bhasma is one such formulation. By keeping in mind, all the related factors the present study entitled as "Clicinical study of *Lauha Bhasma* in the management of *Pandu* w.s.r. to Iron Deficiency Anemia" is done to establish a the role of Bhasma in treatment of diseases.

KEYWORDS: Lauha Bhasma, Anemia, Pandu Roga, Bhasma.

INTRODUCTION

Ayurveda texts, the ancient treatises of Indian System of Medicine are full of different modes of drug administration. A wide range of Pharmaceutical preparations are being offered to patients since ages. A novel drug delivery system came into light with the development of *Rasa Shastra*, in the medieval times. *Rasashastra* is a branch of *Ayurveda* in which metals & minerals are converted into acceptable form[1] i.e. *Rasaushadhis* (which includes *Bhasma, Kupipakva rasayana, Parpati kalpana* etc.) for internal administration. Among these *Rasaushadhis, Bhasma* are used mostly.

Bhasmas are claimed to be biologically produced nanoparticles[2] as *Bhasma* preparations are the concept of reduction in particle size of metal and mineral by treating them with herbal juices or decoction and exposed for certain quantum of heat as per puta mentioned in *Ayurvedic* classical text. Among the role of *bhasma* in various disease, *Pandu roga* or anemia is one such disease in which *lauha bhasma* is widely used and prescribed. *Acharya Charaka* described that *Pandu Roga* is characterized by peculiar changes in the colour of the body like – *Pandu, Haridra, and Harita*. Pallor is a predominant sign of *Pandu Roga.*[3] Monier William dictationary had taken yellowish white, white and pale colour from *Pandu varna*.

In modern sciences, *Pandu roga* may be correlated with Iron deficiency anemia.[4] Anemia is a condition in which the number of red blood cells or their oxygen-carrying capacity is insufficient to meet physiological needs.[5] Without treatment Anemia can worsen and become underlying cause of ill health. According to WHO, prevalence of Anemia in worldwide is 25%. In India as per National Family Health Survey-3 data suggests that Anemia is widely prevalent in all age groups in which 80 % of children under 3 years of age, 58% of pregnant women, about 54% of adolescent girls (15–19 years),[6] 50% of non-pregnant, non-lactating women and 30% of adolescent boys are found anemia. As Iron being the best remedy for *Panduroga* w.s.r. to Iron Deficiency Anemia. *Ayurvedic* classics have recommended formulations of *Lauha* like *lauha bhasma in Pandu roga.*

Several methods of preparation of *Lauha Bhasma* are mentioned in classics. But in the present study herbal method has been taken into consideration for the preparation of *Lauha Bhasma* by using *Triphala kashaya* for *Vishesha Sodhana*, *Bhavana* and *Marana* as per the text of *Ras Ratna Sammuchaya.*

By keeping in mind, all the related factors the present study entitled as "Clinical study of *Lauha Bhasma* in the management of *Pandu* w.s.r. to Iron Deficiency Anemia" is done to establish role of Bhasma in Treatment of dieases.

OBJECTIVE

To Evaluate the role and efficacy of *Lauha Bhasma* on *Pandu Roga* i.e. Iron Deficiency Anemia.

MATERIALS AND METHODS

Selection of the patients

Patients presenting with symptoms of *Pandu Roga* were selected from OPD of Ras-Shastra as well as patients which were referred from other Departments of Rajiv Gandhi Govt. Post Graduate *Ayurvedic* College & Hospital, Paprola. During the study total 15 patients were registered and put into the trial. Patients in age group between 15-60 years of age were included in the trial irrespective of their sex, caste, religion, education etc. Written informed consent of every patient was obtained on research proforma before inclusion into the trial. The clinical trial was started after the approval from Chairman of Ethical committee. Hb% was the main criteria for selection of the patients and only those patients were included in the trial who had Hb% ranging from 7-10gm%.

Trial Drug and Dose: 15 Patients were given one capsule containing 60mg of *Lauha Bhasma* twice a day orally with water empty stomach.

Duration of the trial: The total duration of the trial was 30 days.

Follow-up: The patients were advised to come for follow up after 15th and 30th day of initiation of trial to observe the effects and adverse effects of trial drug.

Assessment criteria: The questionnaire was prepared based on the signs and symptoms of *pandu* described in ancient text with subjective as well as objective parameters.

Table 01: Grading assessment of various signs and symptoms in this clinical study.

S. no	Symptoms or signs		Grade
01.	Pandutva	No pallor	0
		Mild	1
		Moderate	2
		Severe	3
02.	Hriddrava	Absent	0
		Occasionally	1
		Frequent on minimal exertion	2
		Always/Even at rest	3

03.	Alpa Raktata	Hb% between 10.6 to 12gm%	0
		Hb% between 9.5 to 10.5gm%	1
		Hb% between 8.3 to 9.4gm%	2
		Hb% between 7 to 8.2gm%	3
04.	Shithil Indriyatva	Desire and capacity both to do any work	0
		Desire but limited capacity	1
		Limited desire and limited capacity	2
		No desire and no capacity to do any work	3
05.	Karnshveda	Not present	0
		Occasional low frequency sounds in ear	1
		Occasional high frequency sounds in ear	2
		Constant high frequency sounds in ear	3
06.	Daurbalya	Absent	0
		Weakness/fatigue on moderate activity	1
		Weakness/fatigue on minimal activity	2
		Weakness/fatigue even at rest	3
07.	Annadvesha	Good appetite/No repugnance	0
		Three meals a day with little interest and desire	1
		Two meals a day with little desire	2
		Two meals a day with little desire associated with nausea	3
08.	Bhrama (Giddiness)	Not present	0
		Occasional	1
		Giddiness on standing or getting up from sitting position	2
		On getting up from supine posture or on minimal exertion	3
		In all postures or slight change in posture	4
09.	Shwasa	No dyspnoea	0
		Dyspnoea on moderate exertion	1
		Dyspnoea on minimal exertion	2
		Dyspnoea at rest	3
10.	Kopnatva	No irritability	0
		Irritability to loud noise	1
		Irritability to mild noise	2
		Irritability even on talking	3
11.	Pindikodveshtana	No cramps	0
		Occasional cramps	1
		Frequent cramps	2
		Always present	3
12.	Katipada uru ruka	Not present	0
		Present in any one of the above regions	1

		Present in any two of the above regions	2
		Present in all the three regions	3
13.	Urukati padsada	Not present	0
		Present in any one of the above regions	1
		Present in any two of the above regions	2
		Present in all the three regions	3

Statistical analysis

The information gathered regarding demographic data is shown in terms of percentage. The scores of criteria of assessment were analyzed statistically in terms of mean score B.T. (Before treatment), A.T. (After treatment), (B.T.–A.T.) Difference of mean, S.D.(Standard Deviation) & S.E. (Standard Error). Students paired 't' test was carried out at $p<0.05$.

RESULT

A total of 15 patients enrolled for the study. Out of which 02 patients were left the treatment against the medical advice (drop out) and 13 patients completed the trial. So the data of remaining 13 patients were taken and analysed for clinical evaluation.

Demographic profiling: Demographic observations for 15 patients are shown in Table 02 on the basis of Age, Sex, Religion, Occupation, Education, Marital status, Socio Economic Status, Addiction, Diet, *Prakriti.*

Table 02: Demographic profile of study participants.

S. no.	Characteristics		Percentage
01	Gender	Male	5
		Female	10
02	Religion	Hindu	15
		Muslim	0
03	Age	10-20 year	6
		21-30 year	5
		31-40 year	1
		41-50 year	0
		51-60 year	3
04	Marital Status	Married	5
		Unmarried	10
05	Diet	Veg	12
		Mix	3
06	Addiction	Smoking	2
		Alcohol	3
		Tea or Coffee	4

		None	10
07	Social-Economic status	Low	5
		Medium	10
		Higher	0
08	Education	Illiterate	2
		Upto primary	2
		Upto intermediate	5
		Graduation or Post Graduation	6
09	Prakriti	Vatapitta	8
		Pitta Kapha	3
		Vata kapha	4

Effect of therapy on assessment criteria: The effect of the trial drug on various assessment criteria was obtained after statistical analysis of the data obtained and is presented in tabulated form Table 03 as below.

Table 03: Effect of therapy on assessment criteria.

S. No	Signs/ Symptoms	N	Mean score		% age relief	± S.D	± S.E.	T	P
			BT	AT					
1.	*Pandutva*	13	1.46	0.54	63.1	0.27	0.07	12	<0.001
2.	*Hridrava*	10	0.92	.23	75	0.48	0.13	5.19	<0.001
3.	*Alparaktata*	13	1.61	.46	71.4	0.55	0.15	7.5	<0.001
4.	*Shithilindriyatva*	13	1.15	0.46	60	0.48	0.13	5.19	<0.001
5.	*Karnshveda*	8	0.69	0.30	55	0.50	0.14	2.73	<0.05
6.	*Daurbalya*	12	1.23	0.46	62.5	0.43	0.12	6.32	<0.001
7.	*Annadvesha*	10	1.07	.38	64.2	0.75	0.20	3.32	<0.05
8.	*Bhrama*	11	1.23	0.30	75	0.49	0.13	6.74	<0.001
9.	*Shwasa*	13	1.3	0.38	70.6	0.64	0.17	5.19	<0.001
10.	*Kopnatva*	13	1.77	0.61	60.2	1.81	0.50	2.28	<0.05
11.	*Pindikodveshtana*	11	0.92	0.38	58.3	0.66	0.18	2.94	<0.05
12.	*Kati-Pada Uru Ruk*	11	1.15	0.54	53.3	0.43	0.12	6.32	<0.001
13.	*Uru-kati pada Sada*	11	1	0.46	46.2	0.51	0.14	3.74	<0.05

Effect of trial drug on haemoglobin (Hb g%)

The Below table 04 depicts data related to the effect of trial drug on haemoglobin level. Highly Significant improvement ($p<0.001$) was observed in Hb%.

Table 04: Effect of therapy on Hemoglobin value.

Haemo- globin	N	Mean Score		% age Change	S.D.±	S.E.±	T	p- value
		BT	AT					
Group	13	9.01	10.7	1.8	0.66	0.16	8.5	<0.001

DISCUSSION

In this study *Panduroga* has been selected for clinical trial of *Lauha Bhasma* for evaluating better effectiveness because *Lauha* preparations are considered as best remedy for *Panduroga*. Here, *Panduroga* is co-related with Iron Deficiency for their etiological, symptomatic and management similarities. It was found that maximum number of patients i.e. 40% belongs to the age group of 21-30years (*Yovan* period) which is the period of *Pittaj* predominance so it make them prone to Anaemia. Maximum numbers of patients i.e. 70 % were females. Thus it can be said that *Pandu Roga* is more prevalent in females. Probable reason behind this observation may be loss of blood in menstruation. Most of the patients registered were of *vata Pittaja Prakriti* (56.7%) followed by *Pittakaphaja* and *vata Kaphaja Prakriti*. As *Vatapittaja Prakriti* has natural predominance of *Vata* and *Pitta Dosha* which provide a good platform for establishment of *Pandu Roga*, it makes these persons prone to the disease.

The effect of trial drug in patients showed 8 symptom were Highly Significant Improved ($p<0.001$) and 5 symptom were Significant Improved (<0.05). On statistical analysis Highly Significant improvement was observed in Hb% value which showed the clinical effect of the drug on the objective parameter of the assessment of anaemia.

Due to properties like *Yogvahi* (ability to carry a drug & targeted drug delivery), Very Small Particle Size, *Rasibhavana(quick absorption, & assimilated), Shighrvyapti (easily absorbed & spread quickly in body), Agnideepana* (Increases metabolism at cellular level & act as catalyst) cause *Lauha Bhasma* readily absorbed, assimilated & spread quickly in blood and provides maximum bio-availability of iron.[7,8]

Lauha Bhasma with its *Tikta, Kshaya-Rasa, Madhura-Vipaka, Sheeta Virya* and *Saraka Guna* pacify the *Pita Dosha* and treat the *Pitta* predominant *Pandu Roga*. As *Lauha Bhasma* contains iron as a major content i.e. it contains 38.8% iron.[9] Its major role in prevention and treatment of Iron Deficiency Anemia as it is main constituent of hemoglobin.[10]

CONCLUSION

The lauha bhasma due to its action like nanoparticle showed significant relief in the signs and symptoms of *Pandu roga*(Iron deficiency anemia). Bhasma may have acted on the systemic symptoms of *Pandu* as well as give significant improvement on the Hematological

parameters like Hb% Specially. Thus *Lauha bhasma* is effective and safe treatment in the management of *Pandu roga.*

ACKNOWLEDGMENT

We are thankful to the participant for providing informed consent to publish the result of the study.

FINANCIAL SUPPORT AND SPONSORSHIP: Nil.

CONFLICTS OF INTEREST: None declared.

REFERENCES

1. Savrikar, S. S., & Ravishankar, B. Introduction to 'Rasashaastra' the Iatrochemistry of Ayurveda. *African journal of traditional, complementary, and alternative medicines: AJTCAM*, 2011; *8*(5): 66–82. https://doi.org/10.4314/ajtcam.v8i5S.1
2. Sharma, R., Bhatt, A., & Thakur, M. Physicochemical characterization and antibacterial activity of *Rajata Bhasma* and silver nanoparticle. *Ayu*, 2016; *37*(1): 71–75. https://doi.org/10.4103/ayu.AYU_167_15.
3. Trikamji Yadavji, Commentary Ayurvedadipika of Cakrapanidatta on Caraka samhita of Agnivesa, Chikitsa Sthana; Panduroga chikitsa adhayaya: Chapter Varanasi: Chowkhambha Surbharati Prakashan, 2017; 527: 16-11.
4. Kumar, A., & Garai, A. K. A clinical study on Pandu Roga, iron deficiency anemia, with Trikatrayadi Lauha suspension in children. *Journal of Ayurveda and integrative medicine*, 2012; *3*(4): 215–222. https://doi.org/10.4103/0975-9476.104446.
5. Badireddy M, Baradhi KM. Chronic Anemia. [Updated 2020 Nov 18]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing, 2020. Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK534803/
6. https://pib.gov.in/PressReleasePage.aspx?PRID=1575151(Assess date 16 Feb 2021)
7. MAHANTA, Pallabi; P. NIDAGUNDI, Suvarna; SOBAGIN, M. V. CONCEPT & UTILITY OF NANOTECHNOLOGY IN THE STANDARDIZATION OF RASADRAVYA. Journal of Ayurveda and Integrated Medical Sciences (ISSN 2456-3110)**,** http://www.jaims.in/index.php/jaims/pages/view/Citation, v. 5, n. 4, p. 235 - 238, sep. 2020. ISSN 2456-3110.

8. Sharma, R., & Prajapati, P. K. Nanotechnology in medicine: Leads from Ayurveda. *Journal of pharmacy & bioallied sciences*, 2016; *8*(1): 80–81. https://doi.org/10.4103/0975-7406.171730.
9. Gupta, K. L., Pallavi, G., Patgiri, B. J., Galib, & Prajapati, P. K. Critical review on the pharmaceutical vistas of Lauha Kalpas (Iron formulations). *Journal of Ayurveda and integrative medicine*, 2012; *3*(1): 21–28. https://doi.org/10.4103/0975-9476.93944.
10. Institute of Medicine (US) Committee on Micronutrient Deficiencies; Howson CP, Kennedy ET, Horwitz A, editors. Prevention of Micronutrient Deficiencies: Tools for Policymakers and Public Health Workers. Washington (DC): National Academies Press (US), 1998; 3. Prevention of Iron Deficiency. Available from: https://www.ncbi.nlm.nih.gov/books/NBK230103/