Research Article

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A CLINICAL STUDY TO COMPARE EFFICACY OF METAL CONTAINING AND PURE HERBAL COMPOUNDS IN PANDU WITH SPECIAL REFERENCE TO HAEMOGLOBIN

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ABSTRACT

Pandu and low hemoglobin are prime problems in front of current generation of India. Various compounds are mentioned in Ayurveda for management of Pandu viz. metal containing and pure herbal compounds. It is need of today to find out which would better as there are many different opinion worldwide in accordance with metal toxicity of Ayurvedic compounds. This Clinical Study was aimed to compare the efficacy of metal containing compound like Navayas Loha and pure herbal compound like Guda Haritaki in Pandu w. s. r. to Hb gram % level. Study was carried out for 60 days under all ethical circumstances. Interpretation of collected data was done by applying appropriate statistical analysis and student's t test for unpaired data was applied. Patients having Pitta Prakruti, Mandagni, Krura Koshtha, female patients and patients from poor socioeconomic status were found more prone to Pandu. Results suggested that Navayasa Loha were more effective over Guda Haritaki in increasing Hb gram % level. ($t = 4.66$, $P < 0.01$, significant at 99 % confidence limit.)

Keywords: Pandu, Haemoglobin, Navayas Loha, Guda Haritaki.

INTRODUCTION

The word Ayu means life and Veda means knowledge. Ayurveda gives priority to preventive as well as curative treatment[1]. In today's fast life there has been negative revolution in eating habits and changing life style which in turn produce various types of the hematological disorders like Anaemia. According to WHO estimate over one third of population suffers from Anaemia[2] and India is one of the leading country in cases of anemia among the world. Anaemia is a disease characterized by Pallor of body which occurs due to reduction of Hemoglobin and number of RBC's per cubic mm of blood. Pandu is a Pitta pradhana vyadhi[3] due to hetu sevana and Pitta dosha gets vitiated along with other doshas and is circulated in the whole body to affect the Rasa-Rakta dhatu. There is structural and functional degeneration in Rasa-Rakta and Meda dhatu[4]. This is the unique approach of Ayurveda that, it has mentioned management of Pandu in the perspective from Rakta and Meda dhatu along with various kalpas and upakramas to achieve complete cure. Pandu is of five types viz. Vataja, Pittaja, Kaphaja, Sannipataja and Mrid bhakshanaja.[5] Commonly observed symptoms of Pandu are Netrapanduta, Hridspandana, Shwasakashtata, Jwara, Mandagni and Angamarda[6]. Various Ayurvedic

compounds are available for management of Pandu viz. metal containing and pure herbal. It is need of hour to decide which one is more fruitful in all aspects of Pandu. Hence clinical trial was carried out between two Ayurvedic compounds.

MATERIAL AND METHODS

Study Design

This was comparative clinical trial carried out in two groups named Group A and Group B each containing 10 patients. Patients were selected by simple randomized sampling technique irrespective of age, sex, religion and socioeconomic status. 20 patients were further randomly divided into two groups. Permission for clinical trials was granted from Ethical Committee of College (Ref. No.: 642/13-14/A, Dated - 28/12/2013.) Written consent was taken from every patient participated. Patients from Group A were administered with Navayasa Loha while Group B were given Guda Haritaki for 60 days. Student's t test for unpaired data was applied to the collected data at the end.

Place of Work

OPD and IPD of Department of Kayachikitsa, S.V.N.H.T's Ayurveda Mahavidyalaya, Shri Shivajinagar, Rahuri Factory, Dist. Ahmednagar, Maharashtra, India.

Criteria for Selection of Patients

Patients of both sex showing symptoms of Pandu, age between 16 to 60 years and Hb between 6 gram % to 9 gram % were included. While patients having age less than 16 and greater than 60 years, Hb below 6 gram % and above 9 gram %, major diseases like IHD, DM, Liver disorders, CVA, HIV, HbsAg etc and patients with known case of Hemophilia, Thalassemia, Sickle Cell Anaemia etc were excluded.

Criteria of Diagnosis

Patients showing symptoms Shwaskastata, Netra Panduta, Hurdspandana, Angmarda, Mandgni and Jwara and having Hb between 6 gram % to 9 gram % were diagnosed as Pandu patients

Preparation of Drugs

Navyasa Loha

Shunti (*Zingiber officinale*),[8] Maricha (*Piper nigrum*),[9] Pippali (*Piper longum*),[10] Amalaki (*Emblica officinalis*),[11] Bibhitaki (*Terminalia balarica*),[12] Haritki (*Terminelia chebula*),[13] Vidanga (*Embelia ribes*),[14] Chitraka (*Plumbago zeylanica*),[15] Musta (*Cyperus rotundus*)[16] - 1 part each, Loha bhasma - 8 parts.[7]

Guda Haritaki

Guda and Haritki (*Terminelia chebula*)[13] - equal quantity[17]

Administration of Drugs

Navayasa Loha (Group A): 250 mg x BD, on Pashchat bhakta kala with Koshna jala

Guda Haritaki (Group B): 2 g x BD, on Pashchat bhakta kala with Koshna jala

Duration: 60 days, Follow up: after every 15 days

Criteria of Assessment

Assessment of subjective parameters (Table 1)

Assessment of total effect of therapy (Table 2)

RESULTS AND DISSCUSSION

After survey of collected data from 20 patients it was found that Hindu patients (80 %), 31-40 years Age group (40 %) and Females (65 %) found more prone to Pandu. (Table 3) It may be due to less iron rich vegetables intake in Hindu and menstrual problems in females. Observed highest frequencies were as follows, 45 % Pitta Prakruti patients, as Pandu is stated the Pitta pradhana vyadhi,[3] 50 % Mandagni patients, due to Mandagni apakva ahara rasa results in formation of asara rakta dhatu, 65 % Krura Koshtha as it causes apana pratilomata, mandagni and in turn formation of asara rakta dhatu (Table 4), 55 % Vegetarian patients as vegetarians may not get Iron and Vitamin B12 as compared to non vegetarians and 35 % patients each from Poor and Medium socioeconomic status may be due to less awareness, unhygienic and less nutritious food habits. (Table 5) Average increase in Hb gram % among 10 patients of Group A was 1.52 gram % and among 10 patients of Group B was 0.071 gram %. The average percent increase in Hb gram % among 10 patients of Group A was 19.37 % and among 15 patients of Group B was 9.28 %. (Table 6) It means that increase in Hb gram % in Group A is more than that in Group B. Hence it can be understood that Navayasa Loha increased Hb level better than Guda Haritaki. ($t = 4.66$, $P < 0.01$, significant at 99 % confidence limit.) Table 7 showed relief in total score of patients which was greater in Group A (Average: 70.8 %)

than that in Group B. (Average: 46.7 %), while Table 8 showed relief in total score of symptoms which was greater in Group A (Average: 72.6 %) than that in Group B. (Average: 49.93 %). It shows that relief in symptoms of Pandu in Group A was more than that in Group B. Hence it suggests that Navayasa Loha relieved symptoms of Pandu better than Guda Haritaki. ($t = 2.25$, $P < 0.05$, significant at 95 % confidence limit). In group A out of 10 patients Grade III relief i.e. excellent improvement was found in 4 and Grade II relief i.e. good improvement was found in 6 while in group B out of 10 patients Grade II relief i.e. good improvement was found in 5 and Grade I relief i.e. mild improvement was found in 4 and Grade 0 relief i.e. poor improvement was found in 1 (Table 9). In group A out of 6 symptoms Grade III relief i.e. excellent improvement was found in 3 and Grade II relief i.e. good improvement was found in 3 (Table 10a) while in group B out of 6 symptoms Grade II relief i.e. good improvement was found in 3 and Grade I relief i.e. mild improvement was found in 3. (Table 10b). It shows Navayas Loha improved Pandu more than Guda Haritaki. Navayasa Loha[7] contains herbal drugs along with loha bhasma. Amalaki (*Emblica officinalis*),[11] Bibhitaki (*Terminalia balarica*),[12] Haritki (*Terminelia chebula*),[13] i.e. Triphala is pachan, anulomanak, rasayana, tridoshaghna; Shunti (*Zingiber officinale*),[8] Maricha (*Piper nigrum*),[9] Pippali (*Piper longum*),[10] i.e. Trikatu is dipana, pachana; Chitraka (*Plumbago zeylanica*),[15] is dipana, yakritbalya; Musta (*Cyperus rotundus*)[16] is amapachaka, pittaghna; Vidanga (*Embelia ribes*),[14] is krimighna and Loha bhasma is raktavardhaka, dhatuposhaka, balya.[18] Hence Navayasa Loha is balya, bimhana, raktavardhana, dipana, pachana, rasayana kalpa and useful in both sama and nirama avastha. In Guda Haritaki, Guda increases rakta, mamsa, meda and majja.[19] Haritki (*Terminelia chebula*),[13] is doshanulomani, rasayani, dipana, pachana, sarvadoshaghna and useful in Pandu.[20] Hence Guda Haritaki is raktavardhana, dipana, pachana, rasayana, doshashodhaka kalpa and useful in both sama and nirama avastha. Table 11 shows P value (0.000) of the test was less than 0.01, it may be concluded that increase in Hb gram % in Group A was significantly greater than that in Group B. It means Navayasa Loha was more effective in increasing Hb gram % than Guda Haritaki. ($t = 4.66$, $P < 0.01$, significant at 99 % confidence limit.) Table 12 shows P value (0.025) of the test was less than 0.05, it may be concluded that % relief in symptom score in Group A was significantly greater than that in Group B. It means Navayasa Loha was more effective in relieving symptoms of Pandu than Guda Haritaki. ($t = 2.25$, $P < 0.05$, significant at 95 % confidence limit).

CONCLUSION

Navayasa Loha is more efficient over Guda Haritaki in Pandu to relieve symptoms and to increase Hb gram % level. No adverse effect was observed in case of both the drugs and no toxicity was seen in case of Navayasa Loha. Patients having Pitta Prakruti, Mandagni, Krura Koshtha, female patients and patients from poor socioeconomic status were found to be more prone to Pandu and low Hb gram % level.

Table 1: Gradation of Symptoms (Subjective Parameters)

S. No.	Symptoms	Criteria	Grade
1	Shwaskashtata	No Shwaskashtata	0
		Moderate work - Shwaskashtata	1
		Mild work – Shwaskashtata	2
		Shwaskashtata on rest	3
2	Neta panduta	Red	0
		Pinkish	1
		Pale	2
3	Hurdspandana	Heart rate - 60 to 80 / min.	0
		Heart rate - 80 to 100 / min.	1
		Heart rate - 100 to 120 / min.	2
4	Angmarda	No Angmarda	0
		Mild (alpa) Angmarda	1
		Moderate (madhyam) Angmarda	2
		Sever (tivra) Angmarda	3
5	Mandagni	Hunger after 8 hrs.	0
		Hunger after16 hrs.	1
		Hunger after24 hrs.	2
		No Hunger.	3
6	Jwara	No Jwara	0
		Alpa (98.5^{o}F - 99.5^{o}F)	1
		Madhyam (99.6^{o}F - 101^{o}F)	2
		Tivra More than 101^{o}F	3

Table 2: **Gradation of Relief criteria**

S. No.	Grade	% Improvement
1.	Excellent Improvement	75 % - 100 %
2.	Good Improvement	50 % - 75 %
3.	Mild Improvement	25 % - 50 %
4.	Poor Improvement	0 % - 25 %

Table 3: Distribution of patients according to Religion, Age, Sex

Religion	Number of patients	%		Age (yr)	Number of patients	%		Sex	Number of patients	%
Hindu	16	80 %		20-30	06	30 %		Male	7	35 %
Muslim	3	15 %		31-40	08	40 %		Female	13	65 %
Other	1	5 %		41-50	06	30 %		-	-	-
Total	20	100 %		Total	20	100 %		Total	20	100 %

Table 4: Distribution of patients according to Prakriti, Agni, Koshtha

Prakriti	Number of patients	%		Agni	Number of patients	%		Koshtha	Number of patients	%
Vata	6	30 %		Manda	10	50 %		Mridu	0	0 %
Pitta	9	45 %		Vishama	6	30 %		Madhyama	7	35 %
Kapha	5	25 %		Tikshna	4	20 %		Krura	13	65 %
Total	20	100 %		Total	30	100 %		Total	20	100 %

Table 5: Distribution of patients according to Socioeconomic Status and Diet

Economy	Number of patients	%		Diet	Number of patients	%
Good	6	30 %		Vegetarian	11	55 %
Medium	7	35 %		Non-vegetarian	0	0 %
Poor	7	35 %		Mix	9	45 %
Total	20	100 %		Total	20	100 %

Table 6: **% change in Hb gram%**

S. No.	GROUP A				S. No.	GROUP B			
	Change in Hb gram%					Change in Hb gram%			
	B.T.	A.T.	Increase	% Increase		B.T.	A.T.	Increase	% Increase
1	7.2	9.4	2.2	30.5 %	1	7.4	8.5	1.1	14.8 %
2	8.0	9.0	1.0	12.5 %	2	8.0	8.4	0.4	5.0 %
3	7.5	8.9	1.4	18.6 %	3	8.2	9.0	0.8	9.7 %
4	8.2	9.3	1.1	13.4 %	4	6.8	7.2	0.4	5.8 %
5	7.8	8.8	1.0	12.8 %	5	7.1	7.9	0.8	11.2 %
6	8.0	10.2	2.2	27.5 %	6	8.8	9.2	0.4	4.5 %
7	8.1	9.1	1.0	12.3 %	7	8.4	9.1	0.7	8.3 %
8	6.8	8.8	2.0	29.4 %	8	6.9	7.8	0.9	13.0 %
9	8.4	10	1.6	19.0 %	9	7.5	8.4	0.9	12.0 %
10	8.2	9.9	1.7	20.7 %	10	8.2	8.9	0.7	8.5 %
Average			1.52	19.37 %	Average			0.71	9.28 %

Table 7: % relief in total score in patients

S. No.	GROUP A				S. No.	GROUP B			
	Change in Total Score					Change in Total Score			
	B.T.	A.T.	Relieved	% Relief		B.T.	A.T.	Relieved	% Relief
1	9	4	5	55.5 %	1	11	4	7	63.6 %
2	7	3	4	57.1 %	2	7	4	3	42.8 %
3	8	2	6	75.0 %	3	7	3	4	57.1 %
4	7	3	4	57.1 %	4	11	7	4	36.3 %
5	11	4	7	63.6 %	5	9	7	2	22.2 %
6	7	0	7	100.0 %	6	6	2	4	66.6 %
7	6	2	4	66.6 %	7	9	4	5	55.5 %
8	9	3	6	66.6 %	8	7	5	2	28.5 %
9	6	1	5	83.3 %	9	9	5	4	44.4 %
10	6	1	5	83.3 %	10	4	2	2	50.0 %
Average				70.8 %	Average				46.7 %

Table 8: % relief in total score in symptoms

S. No.	Symptoms	GROUP A				GROUP B			
		Change in Symptom Score				Change in Symptom Score			
		BT	AT	Relieved	% Relief	BT	AT	Relieved	% Relief
1	Jwara	7	0	7	100.0 %	7	2	5	71.4 %
2	Shwaskashta	13	4	9	69.2 %	15	11	4	26.6 %
3	Netrapanduta	15	7	8	53.3 %	15	10	5	33.3 %
4	Hridspandan	14	7	7	50.0 %	16	9	7	43.7 %
5	Mandagni	12	2	10	83.3 %	13	5	8	61.5 %
6	Angamarda	15	3	12	80.0 %	14	6	8	57.1 %
----------		Average			72.6 %	Average			48.93 %

Table 9: **Grade of Relief according to total score in patients**

S. No.	Grade of Upashaya	Number of patients	
		Group A	Group B
1	Grade III (75 % - 100 %)	4	0
2	Grade II (50 % - 75 %)	6	5
3	Grade I (25 % - 50 %)	0	4
4	Grade 0 (00 % - 25 %)	0	1
Total		10	10

Table 10a: Grade of Relief according to total score in symptoms in Group A

S. No.	Grade of Upashaya	Group A	
		Symptoms	No.
1	Grade III (75 % - 100 %)	Jwara, Mandagni, Angamarda	3
2	Grade II (50 % - 75 %)	Shwasakashtata, Netra-panduta, Hridspandan	3
3	Grade I (25 % - 50 %)	----------	0
4	Grade 0 (00 % - 25 %)	----------	0

Table 10b: Grade of Relief according to total score in symptoms in Group B

S. No.	Grade of Upashaya	Group B	
		Symptoms	No.
1	Grade III (75 % - 100 %)	----------	0
2	Grade II (50 % - 75 %)	Jwara, Mandagni, Angamarda	3
3	Grade I (25 % - 50 %)	Shwasakashtata, Netrapanduta, Hridspandan	3
4	Grade 0 (00 % - 25 %)	----------	0

Table 11:Two-sample t test for increase in Hb gram % (Table 6) between Navayasa Loha (Group A) vs. Guda Haritaki (Group B)

Group	N	Mean	SD	SE Mean
Group A	10	1.520	0.494	0.160
Group B	10	0.710	0.242	0.077
t - test of difference = 0 (vs. >) : T-Value = 4.66, P-Value = 0.000, DF = 18				
[Difference = mu Group A – mu Group B, Estimate for difference: 0.810 95% lower bound for difference: 0.508, Both use Pooled SD = 0.389]				

Table 12: Two-sample t test for % relief in symptom score (Table 8) between Navayasa Loha (Group A) vs. Guda Haritaki (Group B)

Group	N	Mean	SD	SE Mean
Group A	6	72.6	19.1	7.8
Group B	6	48.9	17.3	7.1
t - test of difference = 0 (vs. >) : T-Value = 2.25, P-Value = 0.024 , DF = 10				
[Difference = mu Group A – mu Group B, Estimate for difference: 23.7 95% lower bound for difference: 4.6, Both use Pooled SD = 18.2]				

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