To Evaluate The Comparative Study Of *Navayas Lauha* With Controlled Known Drug In The Management Of *Pandu Roga* W.S.R. To Iron Deficiency Anaemia

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ABSTRACT: **Background**- In this 21st century, life style changes very rapidly. Now there is competition in every field so most of people have lot of stress. As life style is changing in the society, their diet habits are also changing very rapidly. Now a day's people take Fast food regularly, moreover they show negligence in taking care of their health. As a result of this, people are suffering from various diseases, among these diseases Pandu *Roga* is very common disease seen especially in the developing countries like India. On the basis of information from published and unpublished sources and the hemoglobin cut –off points recommended by WHO scientific group, it is estimated that about 30% of the world's population of 5000 million people are Anemic.

Aim- To evaluate the effect of an ayurvedic formulation *Navayas Lauha* in the management of *pandu roga* on clinical parameters

Materials and Methods- Total 30 patients of Pandu were selected for the present study from the OPD and IPD of Jammu Institute of Ayurveda and Research hospital, Jammu. They were treated in 2 groups;

- **Group A:** 15 patients were included in this group and were given *Navayas Lauha* 200mg OD orally.
- **Group B:** 15 patients were included in this group and were given dried Ferrous Sulphate 150mg OD orally.

Result- overall percentage of improvement in both the groups on different clinical parameters, it was noticed that there was 53.15% improvement in Group A, 39.52% improvement in Group B.

Conclusion- The study revealed that the selected management was better potential effects on *Pandu Roga* with the added advantage of being free from Side Effects

Keywords-Anaemia, Pandu Roga, *Navayas Lauha*

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INTRODUCTION

Humans are the most intelligent and ambitious living being on earth. Because of this, humans are progressively achieving the endless heights in the development of science and technology. With this technology, humans are searching for cost effective, more potent and safer alternative for the management of diseases. As in today's fast pace of life it is difficult to follow the ways of healthy living as a consequence of which people are getting predisposed to many diseases. One of these diseases is pandu. It is very common in the developing countries like India because of faulty diet habits, Unhygienic living standards like open sanitation and in particular the most common suffers are females.[1] Globally 30% of the total population is Anemic and half of these suffer from Iron deficiency anaemia (IDA).[2] IDA is the most common type of anaemia met in practice and the most prevalent nutritional deficiency in the world. It reduces the work capacity of the individuals and brings serious economic consequences and obstacles to the national development.[3] In milder forms, anaemia is silent without symptoms; in the most severe form anaemia occurs along with various sign and symptoms like dyspnea, anorexia, fatigue, pallor of skin, palms, oral mucosa etc.[4] The management of anaemia according to modern medicine includes several iron preparations. But the side effects like nausea, vomiting, constipation, epigastric pain, heart burn, metallic taste, staining of teeth, diarrhea etc. are very frequently encountered with these preparations that further deteriorates the health of the patients.[5] To overcome the adverse effects caused by these drugs we had to find better and satisfactory treatment of Pandu Roga. Ayurveda, the complete and best authentic medical field of ancient

times and been recognized best by W.H.O, has tremendous scope for the management of the disease pandu. In this study, an effort has been put upon to explore the hidden potential laid in ancient times. Various Herbal and Herbo-mineral preparations have been mentioned in ayurvedic classics. *Navayas Lauha* majority of drugs possess qualities like *Tridoshahara, Deepana, Pachana, Hridya, Yakriduttejaka, Krimighna, Raktavardhaka and Rasayana*.[6] So, drug increases the *jatharagni and dhatvagni* upto normal level and the drug diminishes *mandagni* and breaks the pathogenesis of *Pandu Roga*. Thus, in this clinical trial patient of *Pandu Roga* (Anaemia) is managed by *Navayas Lauha*.

AIMS AND OBJECTIVE

1. To evaluate the effect of an ayurvedic formulation i.e. *Navayas Lauha* in the management of *pandu roga* on clinical parameters.
2. To study the nature, incidence and prevalence of pandu in the area where clinical study is being done primarily in the rural belt of Jammu.

MATERIAL AND METHODS

Selection of patients:

Patients were selected from OPD and IPD of Jammu Institute of Ayurveda And Research hospital, Jammu. All the patients were clinically diagnosed and registered properly. A detail of examinations and investigations was carefully recorded in the Proforma. A consent letter from the patient was also attached with the proforma.

Inclusion criteria:

- Patients of either sex between the age group of 18-70 years.
- Patients who were willing to register themselves.
- Patients having hemoglobin concentration:
- 10 - 6 gm% in females
- 11 - 6 gm% in males

Exclusion criteria:

- Age below 18 and above 70 years.
- patients having hemoglobin less than 6gm%
- Patients not willing to be registered.
- Anaemia during pregnancy and lactation.
- Anaemia due to other causes i.e. other than iron deficiency anaemia.
- Long term infectious systemic disease i.e. - T.B, R.A, AIDS, leprosy, Malaria, gout, malignancies and other systemic diseases like VHD etc.
- Patients who had Gastrectomy.

- Patients having sprue, MDS.

Criteria of assessment:

A. Subjective parameters: Parameters to be assessed before and after the completion of clinical trial:

- Pallor.
- Fatigue.
- Appetite

B. Objective parameters:

- Hb gm%

C. Undue Effects:

- Nausea
- Constipation

GROUPS OF PATIENTS

The registered patients for the clinical trial were randomly divided into two groups:

- **Group A:** 15 patients were included in this group and were given Navayas Lauha 200 mg OD orally.

- **Group B:** 15 patients were included in this group and were given Ferrous Sulphate 150 mg OD orally.

DURATION OF THE TRIAL

Clinical trial was conducted for the duration of 45 days with the follow up after every 2 weeks to evaluate the therapeutic effect of the drugs. Observations made and results so obtained were computed statistically for appropriate conclusions.

Changes in patient's status were noted and following points were taken into considering for assessment of results. To assess the effect of therapy objectively, all the signs and symptoms were given scoring pattern depending upon their severity as below:

➢ **PALLOR**

The score was decided on the basis of pallor present in twaka, nakha, netravartma, jihva and *hastapadotala.*

Symptoms	Score
Absent	0
In any two of these	1
In any three of these	2
In any four of these	3
In any five of these	4

➢ **APPETITE**

Symptoms	Score
More than 4 chapatis in full day	0
More than 3 chapatis in full day	1
More than 2 chapatis in full day	2
Less than 1 chapatis in full day	3

➢ **FATIGUE**

Symptoms	Score
Not Present	0
After heavy work, relieved soon & tolerable	1
After Moderate work, relieved later & tolerable	2
After little work & relieved later	3
After little work, relieved later but beyond tolerance	4

➢ **NAUSEA**

Symptoms	Score
No feeling of Nausea	0
Mild Nausea	1
Moderate Nausea	2
Severe Nausea	3

➢ **CONSTIPATION**

Symptoms	Score
Regular Bowel	0
Mild Constipation	1
Moderate Constipation	2
Severe Constipation	3

CRITERIA FOR ASSESSING THE TOTAL EFFECT OF THERAPY

Considering the overall improvement had shown by the patient in sign and symptoms, the total effect of the therapy has been assessed as below. It is assessed on the basis of percentage of relief obtained:

Table 1.

CURED	76% to 100%	Relief in subjective signs and symptoms.
MARKEDLY IMPROVED	51% to 75%	Relief in subjective signs and symptoms
IMPROVED	26% to 50%	Relief in subjective sign and symptoms.
UNCHANGED	up to 25%	Relief in some subjective sign and symptoms only.

LEVEL OF SIGNIFICANCE

$p < 0.001$ is statistically highly significant

$p < 0.05$ is statistically significant

$p > 0.05$ is statistically insignificant

Observation

In this clinical study, 30 patients were registered and randomly placed under two groups, the details are as follows: Total patients registered for the study - 30

Table 2: INCIDENCE OF AGE

S.No	Age group (in yrs)	No of Patients	Percentage
1	18-30	12	40%
2	31-40	8	26.66%
3	41-50	5	16.66%
4	51-60	3	10%
5	61-70	2	6.66%

Maximum number of patients in this study was reported in 18-30 yrs age group i.e. 40%. This was followed by 26.66 % incidence in 31-40 yrs age group, 16.66% in 41-50 yrs age group, 10% in 51-60 yrs age group and 6.66% in 61-70 yrs of age.

Table 3: INCIDENCE OF SEX

S.No	Sex	No of Patients	Percentage
1	Male	6	20%
2	Female	24	80%

Maximum number of patients were females i.e. 80% followed by males 20%.

Table 4: INCIDENCE OF APPETITE

S. No	Appetite	No of Patients	Percentage
1	Poor	28	93.33%
2	Moderate	2	6.67%
3	Good	0	0

Above data shows that maximum patients i.e. 93.33 % were having poor appetite, 6.67 % were having moderate appetite.

Table 5: INCIDENCE OF BOWEL HABITS

S. No	Bowel	No of Patients	Percentage
1	Regular	13	43.33%
2	Constipated	17	56.67%

The table reveals that most of the patient's i.e.60% was having constipation while 40% patients were having regular bowel habits.

Table 6: INCIDENCE OF ADDICTION

S. No	Addiction	No of Patients	Percentage
1	Tea	18	60%
2	Coffee	6	20%
3	Alcohol	4	13.33%
4	Smoking	2	6.66%

Maximum patients 60% were found addicted to tea while 20% were addicted to coffee, 13.33% and 6.66% were addicted to alcohol and smoking respectively.

Table 7: INCIDENCE OF KOSHTHA

S. No	*Koshtha*	No of Patients	Percentage
1	*Mridu*	5	16.67%
2	*Madhyama*	8	26.67%
3	*Krura*	17	56.67%

Observation with regard to the status of the *Koshtha* in patients of Pandu *Roga* revealed that 56.67% of patients were of *Krura Koshtha*, 26.67% were of *Madhyama Koshtha* and 16.67% were of *Mridu Koshtha*.

Table 8: INCIDENCE OF AGNI

S. No	Agni	No of Patients	Percentage
1	*Sama*	4	13.33%
2	*Vishama*	8	26.67%
3	*Manda*	18	60%

Mandagni was observed in maximum number of patients with an incidence of 60%, *Vishamagni* was seen in 26.67% patients and Sama Agni in 13.33% patients.

Table 9: INCIDENCE OF LAKSHANAS

S. No	Lakshanas	No of Patients	Percentage
1	Pallor	30	100%
2	Appetite	28	93.33%
3	Fatigue	27	90%

Incidence of Pallor was found in 100% of the cases, Appetite in 93.33%, Fatigue in 90%.

RESULT

COMPARATIVE ANALYSIS BETWEEN TWO GROUPS(A & B) ON PALLOR

Group	Mean		Mean Diff.	Mean %
	B.T.	A.T.		
A	2.47	1.07	1.4	56.67
B	2.67	0.8	1.87	70

Statistical analysis indicates highly significant results in groups A and group B. But the highest percentage of improvement is seen in Group B (70%).i.e. group B has shown highest improvement in Pallor statistically.

COMPARATIVE ANALYSIS BETWEEN TWO GROUPS ON FATIGUE

Group	Mean		Mean Diff.	Mean %
	B.T.	A.T.		
A	2.87	1.33	1.54	53.65
B	2.53	0.73	1.80	71

Statistical analysis indicates highly significant results in group A and group B. But the highest percentage of improvement is seen in Group B (71%).i.e. group B has shown highest improvement in Fatigue statistically.

COMPARATIVE ANALYSIS BETWEEN TWO GROUPS ON APPETITE

Group	Mean		Mean Diff.	Mean %
	B.T.	A.T.		
A	2	0.93	1.07	53.50
B	1.07	0.93	0.14	13.08

Statistical analysis indicates highly significant results in group A with 53.50% whereas Group B shows insignificant result (13.08%). The highest percentage of improvement is seen in Group A i.e. group A has shown highest improvement in Appetite.

COMPARATIVE ANALYSIS BETWEEN TWO GROUPS ON HAEMOGLOBIN CONCENTRATION

Group	Mean		Mean Diff.	Mean %
	B.T.	A.T.		
A	8.71	10.13	-1.42	16.30
B	8.35	9.93	-1.58	18.92

Statistical analysis indicates highly significant results in groups A and group B. But the highest percentage of improvement is seen in Group B (18.92%).i.e. group B has shown highest improvement in Hemoglobin Concentration statistically.

COMPARATIVE ANALYSIS BETWEEN TWO GROUPS ON NAUSEA

Group	Mean		Mean Diff.	Mean %
	B.T.	A.T.		
A	0.73	0.2	0.53	72.60
B	0.53	0.67	-0.14	26.41

Statistical analysis indicates highly significant results in group A and Insignificant results in group B and the highest percentage of improvement is seen in Group B (72.60%).i.e. group B has shown highest improvement in nausea.

COMPARATIVE ANALYSIS BETWEEN TWO GROUPS ON CONSTIPATION

Group	Mean		Mean Diff.	Mean %
	B.T.	A.T.		
A	0.8	0.27	0.53	66.25
B	0.53	0.73	-0.2	37.73

Statistical analysis indicates significant results in group A and Insignificant results in group B and the highest percentage of improvement is seen in Group A (66.25%).i.e. group A has shown highest improvement in constipation.

DISCUSSION

Pandu Roga is a disease characterized by pallor of body which strikingly resembles with 'Anaemia' of Modern science, disease characterized by reduction in the Hb gm % and No. of RBC'S/cumm of blood there by reducing the oxygen carrying capacity of blood resulting in pallor like other symptoms. Pandu Roga can be effectively compared with Anemia on the grounds of its similar signs and symptoms. The world's population is increasing at a rapid rate, with the result most of the people are living in un-hygienic, under-nourishing conditions and facing various effects of stress and strain factor. Not only poverty and malnutrition play a vital role in its etiology, but several other etiological and predisposing facotrs like chronic intestinal worm infestation and malabsorption are similarly responsible for it. Illiteracy is also a problem in developing countries like India due to which great majority of people are living under poverty line, who cannot get quantitatively sufficient diet. Even pregnant ladies don't get proper nourishment due to which mother and infant mortality is at higher level. Though always not having very serious effect, the disease causes extreme debility as the symptoms like *Hridspandanama* (Palpitation), *Swasha* (Dyspnoea on exertion), *Shrama* (Fatiguability), etc. follows with the progression of disease.[7] In starting there is physiological adaptation

and the patient do not bother, but after some time due to long lasting of disease, metabolic defects occur due to which there is emaciation and wasting of body and a feeling of sickness is always there with the patient.

PLAN OF THE STUDY-It is a very common nutritional deficiency prevalent in the society. So, the present study has been carried out to analyze the cure rates and compare the effects of *Navayas Lauha* with the known standard compound trusted from years i.e. Ferrous Sulphate. Thus, whole study was performed in two groups: **Group A – *Navayas Lauha*, Group B –** Ferrous Sulphate (Control group).The patients were assessed on different parameters for obtaining the effect of therapies. All clinical signs and symptoms were assessed on the basis of scoring given to them. The general observations pertaining to the age, sex, and occupation etc. of 30 patients of Pandu Roga recorded in this series are discussed here:

➢ **Age:** On the observation of age wise distribution of Pandu, it was found that maximum number of patients 40% were between the age group of 18-30 years and 26.6% were between the age group of 31-40years. 16.66 % patients

belonged to 41-50 years age group. 18-30 years of age is the time of maximum physiological growth, menstruation and child bearing age. Besides this, it is the age of maximum mental stress regarding studies, job etc due to which proper nutritional diets may be ignored. 41-60 years of age is the period of menopause in females. It is a common practice in our country to take calcium and iron pills continuously especially during this period. This calcium forms insoluble hydroxides which hampers the ionization of metal. Besides this hydroxides are alkaline in nature due to which fe^{2+}ions get converted in to fe^{3+}, resulting in to poor absorption of the metal. So, it can be concluded that Pandu is most prevalent in menstruating, child bearing age group and menopausal age group as well.

➢ **Sex:** Sex incidence in Pandu Roga in the present study was found as incidence in male was 20% and in females it was 80 % of the cases. Thus, we can say that this disease is more prevalent in females. Reason behind this may be firstly of dietic, as ladies are careless towards their own care and mostly ignorant towards proper nutritional and balanced diet. Secondly

regular loss of blood due to menstruation makes them more prone to develop Pandu. Thirdly most of the female patients had the history of blood loss due to one or other reason during their delivery and that may also be one of the reasons of females being more in number.

➤ **Addiction:** The observation reveals that maximum patients i.e. 60% had the habbit of tea, 20% had the habbit of coffee, and about 13.33% had the habit of alcohal, 6.66% patients had the habbit of smoking. The maximum numberes of patients were addicted towards tea which causes *mandagni and dhatukshaya* which leads to *vata prakopa.* Moreover, tea contains Tannins that inhibits iron absorption in the body. Tobacco chewing is also harmful to digestive processes.

➤ **Bowel Habits:** Maximum numbers of the patients 60% were having constipation which suggests that constipation is the important cause of the disease.

➤ **Agni:** Maximum numbers of patients i.e. 60% were having *Mandagni and the reason is that Pandu is an agnimandya janya vyadhi. Also, Mandagni* causes inadequate dietary intake ultimately leading to malnutrition, the root cause of disease.

➤ **Koshtha:**56.67% patients were having *krura koshtha and 26.67% had madhyama Koshtha* while 16.67% were having *mridu koshtha. Krura koshtha* indicates the dominance of *vata dosha* and improper digestion which again leads to malabsorption and causes Pandu.

➤ **Appetite:** Maximum patients i.e. 93.33% were having Poor Appetite, 6.67% were having Moderate appetite.

➤ **Incidence of Lakshanas** Incidence of *Panduta* was found in 100% of the cases, *Aruchi* in 93.33%, *Daurbalya* in 90%. Thus, it was noted that *Panduta, Aruchi and Daurbalya* were the main presenting symptoms in the patients of *Pandu Roga.*

SYMPTOMATOLOGICAL CONSIDERATION & EFFECT OF THERAPIES

➤ **Pallor:** This symptom was found in 100 % (30) patients. The most important presenting sign of Pandu Roga is Panduta or pallor where luster of the skin is lost. This sign is the most conclusive sign of the disease because whenever any patient comes across, the

first thing observed is the appearance. Varna and prabha are the properties of *Raktadhatu and pitta dosha*, particularly the *Bhrajaka and Ranjaka* pitta. It is also the property of *ojas* as more and more *ojakshaya, raktakshaya* and pitta *prakopa* occurs the patient becomes *hatprabha or Panduta* appears. Regarding the effect of therapy, the results were found to be highly significant in both the groups i.e $p<0.001$. In group A 56.6 % relief was found and in group B 70% relief was found.

➢ **Fatigue:** This symptom was found in 90 % (27) patients. Hence it can be inferred that, this symptom is also most prominent in disease Pandu. This is again due to rasa *raktadi dhatukshaya, raktalpata and ojakshaya*. If we consider it from modern point of view the red cells in the blood are responsible for supplying oxygen to body tissues. The oxygen is very necessary for the normal metabolic activities. When there is decrease in number of red cells, metabolic activities are hastened and if this condition persists for a long period, Debility appears. Regarding the effect of therapy results were highly significant in case of both the groups i.e $p<0.001$. In group A 53.65% relief was found and in group B 71% relief was found. The drug *NAVAYAS LAUHA* contains *Rasayan like Triphala* and *Loha* so it is very effective to decrease *Daurbalya.*

➢ **Appetite:** Appetite was found in 93.3% (28) patients. Regarding the effect of therapy results were highly significant in group A i.e. $p<0.001$ with 53.50% relief and group B shows insignificant result with 13.08% relief.

EFFECT OF THERAPIES ON HAEMATOLOGICAL VALUE- Haematological values which are considered to see the effect of drug in case of Pandu Roga were Hb gm%. Hemoglobin percentage was the most important investigation which gave us idea about Anaemia. After treatment, trial drug was also found effective in increasing the Hb gm% and when statistical analysis was carried out, effect of drug was found to be highly significant as well.Statistically highly significant results were seen in Haemoglobin concentration in both the groups. i.e. $p<0.001$. In Group A 16.30% relief was found and in group B 18.92% relief was found.

UNDUE EFFECTS

➤ **Nausea:** Regarding the effect of therapy results were highly significant in group A i.e. $p<0.001$ with 72.60% improvement in nausea and Insignificant results in group B with 26.41% of improvement. Thus the highest percentage of improvement is seen in Group A.

➤ **Constipation:** Regarding the effect of therapy results were highly significant in group A i.e. $p<0.001$ with 66.25% improvement and Insignificant results in group B with 37.73% of improvement. Thus the highest percentage of improvement is seen in Group A.

COMPARISION OF THERAPIES

➤ **Group A:** In patients treated with *Navayas Lauha*, highly significant relief was observed in symptoms pallor, fatigue, Appetite. Regarding Haematological values also results were highly Significant in Hb. Regarding the Undue effects highly significant relief was observed in case of Nausea and Significant relief was observed in case of Constipation.

➤ **Group B:** In control Group, Highly significant results were observed in symptoms pallor, and fatigue, where as insignificant results in Appetite. Regarding Haematological values result was observed highly significant in Hb. Regarding the Undue effects insignificant results were observed in both i.e. Nausea and Constipation.

Overall Improvement-While assessing the overall percentage of improvement in both the groups on different clinical parameters, it was noticed that there was 53.15% improvement in Group A, 39.52% improvement in Group B.

CONCLUSION

Overall comparison of the therapy showed that the results were found better with high percentage relief in the patients under Trial Group *Navayas Lauha* in comparison to the Control Group. In future the study may also be conducted with varying doses, combinations and duration of treatment and with more resources and scientific parameter

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