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Research Article

CLINICAL EVALUATION OF HAEMATINIC PROPERTY OF CERTAIN INDIGENOUS DRUGS IN IRON DEFICIENCY ANEMIA

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ABSTRACT

Iron deficiency anemia produces vague symptoms such a lethargy, body ache and weakness. The course of these diseases is generally very slow, over a prolonged period the patient is devoid of the nutritional factors through the diet and the other sources of such nutritional factors. As the deficiency persists due to deficient production of blood, pallor of skin, nails and palpebral conjunctiva, edema of eyelids, pedal edema and dyspnoea on exertion gets appeared. Due to the advancement of the pathology, various investigations were carried out to rule out the other pathologies and put the patient on aggressive therapy. The early diagnosis of the disease and its appropriate treatment are the best answers to such problems. 30 patients of Iron deficiency anemia were diagnosed on the basis of signs and symptoms along with blood hemoglobin level between 6 to 9 gm%, microcytic and hypochromic peripheral smear and serum iron level were included in this study. Gud, Sunthi, Til, Mandur in equal quantity and Pippali in double quantity are were administered orally to alleviate Iron deficiency anemia. The overall result showed 50% are totally cured, 30% got marked relief, 10% are moderately improved and 10% patients didn't respond to the treatment. Pippali, and sunthi are considered as one of the best Agnideepaka, Aamapachaka Yakrituttejaka and Krimihar drugs are used to increase the digestive power. Gud and Til are good source of iron. Sheet Veerya of Mandur & Gud and Kashaya rasa of Mandur & Til acts as Haemostatic action. The drugs used in this study are very effective, safe and good Agnideepaka, Raktavardhaka and Yakrutottejak for iron deficiency anemia. It is very easy to take, all the constituents are readily available, cost effective and with rare adverse effects.

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INTRODUCTION

In developing countries, a large population is affected by Nutritional Deficiency Diseases, Iron deficiency anemia, Blindness due to Vitamin A deficiency; Kwashiorkor and Marasmus due to Protein deficiency, Rickettsiae due to Calcium deficiency are some of the toppers in such nutritional deficiency diseases.

The course of these diseases is generally very slow. Over a prolonged period the patient is devoid of the nutritional factors through the diet and the other sources of such nutritional factors. The development of signs and symptoms due to deficiency of these nutritional factors is gradual and slow. These diseases in the initial stages do not affect the daily life and routine activities of patient so adversely that they hardly need to visit the physicians. And moreover, the population

which is affected by such diseases is economically poor and this does not allow them to go for the medical aid. But as the disease progresses, the signs and symptoms become more severe, and this makes the patient to run to the doctor. At this stage, due to the advancement of the pathology, the doctor has to carry out various investigations to rule out the other pathologies and put the patient on aggressive therapy. It is not only a time consuming and costly job but also causes the psychological upset of the patient. The early diagnosis of the disease and its appropriate treatment are the best answers to such problems.

The anemia can be classified according to the causes such as Hemolytic anemia, Aplastic anemia, Pernicious anemia etc. On the basis of morphology of R.B.C.s it can be classified as Microcytic hypochromic anemia, Macrocytic anemia and Normocytic normochromic anemia. Iron deficiency anemia is

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included in Microcytic hypochromic anemia. Iron is essential for the development of red blood corpuscles. Due to deficiency of iron the R.B.C.s cannot develop properly and their size becomes smaller than the normal. Also the hemoglobin synthesis cannot occur properly which results in hypochromic red blood cells.

Initially the iron deficiency produces vague symptoms such as lethargy, bodyache and weakness. As the deficiency persists due to deficient production of blood, pallor of skin, nails and palmar conjunctiva, edema of eyelids, pedal edema and dyspnoea on exertion gets appeared. Angular stomatitis, Koilonychia, Glossitis also gets appeared. The Congestive Cardiac Failure and Cardiac Arrest are the rare complications develop due to cardiac overload.

In the management part of Iron deficiency anemia oral iron preparations (200 mg three to four times in a day) or parenteral iron preparations are widely used. Dyspepsia, constipation, black colored stool are some of the adverse of oral preparations while anaphylaxis and abscess at the injection site are the complications of parenteral preparations.

In Ayurvedic texts Louha bhasma or Mandur bhasma are used for the management of Pandu. Taking into consideration of the Samprapti factors such as Agnimandya and Dhaturukshata along with Raktakshaya various other drugs are used with Mandur or Louha. The other drugs used with Mandur or Louha are generally Agnideepak, Yakritottejak Snigdha, Krimihar, Raktashodhak, Raktavardhak and some of them are good sources of iron.

In Charak Samhita, Chikitsa Sthana, Pandurog Chikitsa, Acharya has described the Nidan, Purvarupa, Rupa, Samprapti and Chikitsa of Pandurog. Various iron and mandur preparations are advised to use in this chapter. Gud, Sunthi, Til, Mandur in equal quantity and Pippali in double quantity are made into pills. They are administered orally to alleviate Pandu. The study was planned to evaluate the effect of certain indigenous drugs in cases of Iron deficiency anemia.

Objectives

An effort to evaluate the merits and demerits of certain indigenous oral preparation, its effectiveness and the amount of hemoglobin percentage increase in the proposed time period and to study its adverse effects if any.

MATERIALS AND METHODS

Patient

In this study 30 patients of anemia were studied. These patients are diagnosed with the help of signs and symptoms described in various texts along with the blood investigations such as blood hemoglobin level, peripheral smear for anemia typing and serum iron level wherever possible. The patients were selected randomly, irrespective of their age, sex, caste, religion, educational, social and economical status. The patients are treated only at outpatient department level. In beginning detailed medical as well as surgical history and family history was taken to exclude the possibilities of hereditary anemia, aplastic anemia or anemia of chronic diseases.

Test Medicine

As described by Charakacharya in 16th chapter of Chikitsasthan, Gud, Sunthi, Til, Pippali and Mandur bhasma was prescribed to the patients to evaluate its efficacy regarding the symptomatic relief and hematological changes in cases of Pandu (Iron deficiency anemia).

Ingredients

Gud	-	1 Part
Sunthi Churna	-	1 Part
Suddha Mandur	-	1 Part
Kale Til Ka Churna	-	1 Part
Pippali Churna	-	2 Part

All the ingredients are mixed uniformly and administered in the form of capsules.

Dose of the Drug : 2 capsules B.D. (each capsule contain approximately 500 mgs of drug i.e. 83 mg of Mandur bhasma).

Anupan : Luke warm water.

Route of Administration : Oral route should be followed

Seven Kal : The drug is administered after meals

Criteria of Selection of Patients

30 patients were randomly selected after confirmation of diagnosis by means of symptoms and hematological examinations. The gradation of symptoms of each patient is noted. The important factors which are necessary for the selection of patients are as follows –

- Age - 18 years and above.
- Sex - Both sexes
- Those who regularly attended the OPD
- Patients are selected randomly irrespective of the socio-economic status, education, caste, religion, profession.
- The patients with symptoms described in texts and hematological investigations viz hypochromic and microcytic anemia with Hb level ranging from 6 gm% to 9 gm% were considered for the proposed study.

Criteria for Rejection

- Below 18 years of age.
- Pregnant women
- Anemias with genetic predisposition - Thalassemia, sickle cell anemia, spherocytosis etc.
- Megaloblastic anemia, aplastic anemia, anemia of chronic disease
- Patients receiving treatment for other diseases

Criteria of Diagnosis

For this study, the patients were diagnosed on the basis of clinical features described in text along with the laboratory findings. The clinical features comprises of Nakh, Netra Panduta (Pallor), Akshikut Shotha (Edema of eyelids), Dourbalya (Fatigue), Agnimandya (Anorexia), Angasad (Lethargy), Bhram (Giddiness), Shram (Lassitude), Shwas (Dyspnoea), Hritspandan (Palpitations), Pindikodweshtan

(Cramps in calf muscles), Gatrashul (Bodyache), Padshotha (Pedal oedema), Mruttikka seven ki Ichha (Pica).

In laboratory tests hemoglobin percentage, complete blood count and peripheral smear for anemia typing were carried out.

General Management of Patients

The outdoor patients were advised to visit OPD regularly after each week starting from the 1st day of treatment. In the beginning general examinations which include pulse rate, blood pressure, heart sound and rate, respiration rate and general abdominal examinations were noted. In the follow up the symptomatic improvement in patients were noted. The patients were also enquired about any adverse effects of the drug. Blood examinations were repeated at the end of 2nd week and after one month of treatment.

Diet Regimen

During the period of treatment patients were advised to avoid iron containing food viz. meat, eggs, peas, fruits and vegetables.

Criteria of Assessment

Criteria adopted for the assessment of therapy was divided into following categories –

1. Clinical parameters
2. Hematological investigations

The patients were assessed each week after starting the treatment on scoring of cardinal signs and symptoms of Iron deficiency anemia. Scoring pattern was developed according to severity of symptoms. Results were analyzed statistically as per the assessment chart.

Subjective Parameters: Symptoms (Pallor, Edema of eyelids, Weakness, Anorexia, Lethargy, Giddiness, Lassitude, Dyspnoea, Palpitations, Cramps in calf muscles, Bodyache, Pedal edema, Pica) were evaluated on the basis of 0=Normal, 1-Mild, 2-Moderate and 3- Severe.

Objective Parameters: Evaluation of hematological investigations such as hemoglobin percentage, TLC, DLC was carried out, initially, after 2 weeks and at the end of 1 month. Peripheral smear for anemia typing was carried out initially and after treatment of each patient. Urine and stool examinations were carried out wherever necessary to exclude the possibility of occult blood loss through urine or stool and intestinal helminthes.

Assessment of total effect: The total effect of therapy was assessed as;

Assessment	Score
Complete cure	100%
Marked Relief	> 50 to 99%
Moderate Response	> 25 to 50%
Mild Improvement	< 25%
No response	0%

Observation

The clinical evaluation of haematinic property of certain indigenous drugs was studied in 30 patients suffering from Iron deficiency anemia, fulfilling the inclusion criteria. The observations were as follows: Maximum numbers of patients

were obtained in the age group of 26-45 years that is 50%. Female patients were 70% while 30% patients are male. Most of the patients are from Hindu community and are married. Most of the patients are illiterate and are from poor & middle class. Maximum numbers of patients are either labor or housewife.

RESULT

The total score and percentage of each symptom of all patients was evaluated. In Nakh, Netra Twak Panduta (Pallor) relief percentage was 79.37%, in Akshikutshotha (Edema of eyelids) relief percentage was 77.78%, in Dourbalya (weakness) relief percentage was 82.54%, in Agnimandya (Anorexia) relief percentage was 87.5%, in Angasad (Lethargy) relief percentage was 80%, in Bhram (Giddiness) it was 82%, in Shram (Lassitude) relief percentage was 73.21%, in Shwas (Dyspnoea) relief percentage was 73.33%, in Hritspandan (Palpitations) relief percentage was 75%, in Pindikodweshtan (Cramps in calf muscles) relief percentage was 73.08 and in Gatrashul it was 86.44% and in Padshotha (Pedal edema) relief percentage was 62.63%. No patient complaining of Mruttikka seven ki Ichha (Pica) was reported.

Effects of drug on symptoms of Iron deficiency anemia

Symptom	Mean		SD	SE	P	Significance
	BT	AT				
Pallor	2.1	0.43	0.85	0.15	<0.001	***
Edema of eyelids	1.2	0.26	0.58	0.10	<0.001	***
Weakness	2.1	0.36	0.61	0.11	<0.001	***
Anorexia	0.8	0.10	0.30	0.05	<0.001	***
Lethargy	2.0	0.40	0.49	0.09	<0.001	***
Giddiness	1.66	0.30	0.59	0.10	<0.001	***
Lassitude	1.86	0.50	0.62	0.11	<0.001	***
Dyspnoea	1.0	0.26	0.58	0.10	<0.001	***
Palpitations	0.80	0.20	0.48	0.08	<0.001	***
Cramps in calf muscle	1.73	0.46	0.68	0.12	<0.001	***
Bodyache	1.96	0.26	0.52	0.09	<0.001	***
Pedal edema	1.06	0.36	0.66	0.12	<0.01	**

Effects of drug on Haemoglobin Percentage

Treatment Duration	Mean	SD	SE	P	Significance
BT	7.807	0.853	0.1557	-	-
AT	9.950	1.276	0.2329	> 0.05	ns

Before treatment Mean \pm S.D. of Treated Group (A) was 7.807 \pm 0.8530, after treatment it increases to 9.950 \pm 1.276. P value was > 0.05 suggested not-significant result in the score after completion of the treatment. In TLC and DLC the results were not significant.

In Peripheral smear for anemia typing 4 patients returned to normochromic with some normocytic red cells along with microcytes. 6 patients improved to mildly hypochromic from hypochromic red blood cells. The oral iron supplementation initially replenishes the depleted iron stores of body and then the red blood cells return to normocytic and normochromic stage. This is very slow process and it takes 2-3 months for such changes to occur.

DISCUSSION

This study was conducted as clinical evaluation of haematinic property of certain indigenous drugs in iron deficiency anemia. The results of this study demonstrate that most of the patients

got marked relief or moderate response after completion of treatment.

The female loses 1mg of iron per day through the menstrual blood loss. Also the inadequate dietary intake, poor qualities of food, frequent deliveries add to the iron loss. The females are indulged in the routine family affairs so busily that they cannot pay attention towards their balanced diet. They are also in psychological stress due to family problems. They also lose iron through menstrual bleeding, home deliveries and frequent surgeries. All this pushes the females to develop anemia. In our country usually we prefer to get married at the age of 25 years and around. This can be the most applicable cause for such observation. Also after marriage the frequent labours and abortions in the females add to the iron loss.

In illiterate peoples the poor awareness about the nutritional diet, negligence towards the disease and poor economical condition are the probable justification for high incidence of disease. The inadequate dietary supplements, high frequency of deliveries, negligence towards the disease itself and the high prevalence of anemia in poor and middle class, while in upper class good quality of food and early diagnosis of anemia or its causes and their treatment are the causes for its low prevalence and also the locality around the hospital are either poor or middle class.

As the majority of patients in this study were either Labors or Household workers, they were not economically rich to meet their dietary needs and also cannot pay much attention towards their health. The non-vegetarian food such as liver, heart and meat contains high amount of iron than the vegetarian food, but the majority of patients reported to consume mixed diet take non-vegetarian food occasionally. Their diet is also lacking of iron rich cereals, fruits and vegetables. And also, due to poor digestive power the ingested food is not digested and absorbed properly and hence cannot meet the daily iron needs.

The symptom pallor is present due to deficiency of hemoglobin in blood. As after the treatment hemoglobin percentage is increased we found considerable relief. Due to low hemoglobin percentage the blood viscosity falls which results in fall in the intravascular osmotic pressure. This gets accumulated into the subcutaneous tissue around eyes. After the treatment, the increase in hemoglobin percentage causes intravascular osmotic pressure to rise and subsequent reduction in edema of eyelids.

Gud and Til are Balya Dravya, Pippali is also Rasayan in its property. This all relieves the patients from weakness. Sunthi and Pippali are considered as one of the best Amapachak and Agnideepak drugs. Their action increases the digestive power of the patient and also increases the iron absorption from the G.I. Tract. Sunthi and Pippali are considered as the Vedanasthapan drugs. Also Gud and Til increases the strength of patient and relieves lethargy. The inadequate oxygen supply to central nervous system due to low amount of oxygen carrying hemoglobin results in giddiness. Mandur, Gud and Til replenish the iron stores of body and increase hemoglobin percentage in the blood which results in the relief of Giddiness. The ability of Pippali, Gud and Til to cope up with various physical stressors helps in relieving lassitude. The low hemoglobin percentage in the blood cannot meet the oxygen demand of body tissue which results in dyspnoea and the

cardiac overload produces palpitations. After the treatment the hemoglobin percentage increases which supply the body tissues with oxygen adequately, hence the patients got relief from Palpitations. Sunthi and Pippali are considered as the Vedanasthapan drugs. Also Gud and Til increases the strength of patient and relieves cramps in calf muscles. The Ushna Virya and Snigdha Guna of Sunthi, Til and Pippali subdues the deranged Vayu of body and relieves bodyache.

The low hemoglobin percentage dilutes the blood which results in fall of intravascular osmotic pressure. As the fluid flows from low to high osmotic pressure in the body, the intravascular fluid exudates into the extra-vascular tissue spaces, especially in the dependent parts of body producing pedal edema. The drug increases the hemoglobin percentage and causes rise in osmotic pressure inside the capillaries. This results in return of extra-vascular fluid into the blood vessels and subsequent decrease in pedal edema.

Action of Drug

Drug	Rasa	Virya	Vipak	Guna	Doshakarma
Gud	Madhur	Sheet	Madhur	Guru, Snigdha, Sara	Vatanashak, Pittashamak, Kaphakarak
Sunthi	Katu	Ushna	Madhur	Laghu, Snigdha	Vatashamak, Kaphashamak
Til	Madhur, Kashaya, Tikta	Ushna	Madhur	Guru, Snigdha	Vatashamak, Pittaprakopak, Kaphaprakopak
Pippali	Katu	Anushnasheet	Madhur	Laghu, Snigdha, Tikshna	Vatashamak, Pittaprakopak, Kaphashamak
Mandur	Kashaya	Sheet	-	Guru, Snigdha	Vatashamak, Pittashamak, Kaphashamak

In anemia due to poor digestive power, the ingested food is not properly digested which in turn hampers the absorption and assimilation of food. As dietary food is main source of iron which is needed for haemopoiesis; its improper digestion, absorption, and assimilation results in inadequate supply of iron to the body. Pippali, and Sunthi, which are considered as one of the best Agnideepaka and Amapachaka drugs, are used to increase the digestive power. They also help in the digestion and absorption of mandur bhasma.

In anemic patients there is also need of Yakritottejaka property to increase the secretion from the liver, as it plays a very important role in digestion and absorption of food. Pippali and Sunthi also possess the property of Yakritottejan.

As the deficiency of iron, is the chief course to develop anemia, prime importance should be given to supplement the body with extra iron. Hence Mandur bhasma is used in this preparation which is easy to digest with less known adverse effects, than that of iron, and it is also can be used in children and females safely. Gud and Til, which are used in this preparation, are also good source of iron and they help Mandur to replenish the depleted body iron stores.

As described in texts there is Dhatুরুshata in the patients of anemia. All the drugs used in this preparation are Snigdha in their properties and thereby they relieve the dhatুরুshata. In anemic patients the possibility of intestinal worm infestation cannot be ruled out. Moreover Gud and Til are Krimikarak. To overcome this problem Pippali and Sunthi are used, which are

Krimihar in their property. In oral iron preparation there is always a fear of dyspepsia and constipation persists. The Mandur bhasma used here is impregnated with Triphala Kwath (Shodhan of Mandur), which is mildly purgative in its property. The possibility of occult blood loss through urine and stool cannot be ruled out in such patients of anemia. Sheet virya of Mandur & Gud and Kashaya rasa of Mandur & Til acts as haemostatic (Raktasthambaka) and check the blood loss of body if it is there.

The safety and tolerability of study medications was assessed based on adverse effect reported by patients or observed by the investigator during evaluation. No clinically significant adverse effect neither reported by the patients nor observed by the researcher during the study.

As revealed by the results, in different subjective parameters significant improvement and in objective parameter non significant result in disease condition was observed, which can be attributed to the test medicine.

CONCLUSION

The drug combination used in this study is very effective, safe and good Agnideepaka, Balya, Raktavardhaka and Yakritottejak for iron deficiency anemia. It is very easy to take, all the constituents are readily available, cost effective and with rare adverse effects. The overall result showed 50% are totally cured, 30% got marked relief, 10% are moderately improved and 10% patients didn't respond to the treatment. Though this study was carried out in limited patients for a limited period, the mass study programming is needed for further huge database statistical study.

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