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ORIGINAL RESEARCH

# Role of *Dadimadi Ghrita* in the Management of *Pandu Roga* with Special Reference to Hypochromic Microcytic Anemia

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## ABSTRACT

**Introduction:** *Pandu roga* is characterized by pallor of the body which is called as "anemia" in modern sciences. Anemia is a state in which the hemoglobin (Hb) concentration falls below the accepted range depending on age and sex. In India, the incidence of iron deficiency anemia is alarmingly high, varying from 60 to 70%. In the present work, emphasis will be made to study the efficacy of *dadimadi ghrita* in *pandu roga* and results will be compared with capsule Autrin (ferrous fumarate).

**Materials and methods:** Sixty patients of *pandu roga* were randomly selected from the outpatient department (OPD) and inpatient department (IPD) of study center, and were divided into two groups, each group having 30 patients. Group I patients were administered *dadimadi ghrita* orally for 1 month and group II patients were given capsule Autrin for the same duration.

After complete clinical trials, the subjective and objective parameters before and after treatment were recorded for final analysis.

To see the efficacy of each drug on separate group, paired t-test was applied for all symptoms. For comparative study of both drugs, unpaired t-test was applied. To study the overall effect of therapy, chi-square test was applied.

The improvement in the patient was assessed mainly based on increasing percentage of Hb and improvement in the signs, symptoms, general health, and other biological parameters.

**Results:** Overall comparison showed that best results were obtained in both the trial group and the control group in the form of better statistical significance and percentage relief. The present study reveals that the selected management has potential effect on *pandu roga* with the added advantage of being free from side effects.

**Conclusion:** Patients of both the groups show significant improvement in their signs, symptoms, and investigational parameters. Thus, both the treatments are equally effective.



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## INTRODUCTION

When panduta, i.e., paleness, is aggravated, then it is called as *pandu roga*. The pathology of *pandu roga* is mainly concerned with vitiation of pitta which in turn vitiates the rakta, leading to the condition of pandubhava. Due to nidana sevana, the process of *pandu roga* is commenced with the prakopa of all three doshas and dhatus. The pitta dosha takes a leading part in the production of dhatushaithilya and dhatugaurava. Then occurs bal-akshaya, varnakshaya, and ojakshaya arising out of the dosha dushya pradushtana, affiliated with taktalpata, medalpata, nisarata, vaivarnata, and shithilendriya.[1-3]

Anemia according to World Health Organization criteria is serum Hb level or hematocrit less than the expected value for age- and sex-matched normal persons. Careful evaluation of the blood smear reveals that first appearance of microcytic cells and hypochromic reticulocytes in circulation. Iron deficiency anemia is the most common type of anemia. Iron preparations have satisfied the results but have some side effects.[4-6] Snehapana is the most effective treatment of *pandu roga*. As ghrita is vatapittashamaka, it decreases the prakupit pitta in *pandu roga*. By its jatharagnivridhikar property, it inhibits the symptoms of pandu like agnimandya, aruchi; increases bala and varna; and makes snehan of the body. All contents of *dadimadi ghrita*, i.e., chitrak, shunthi, pippali, etc., have deepan, pachan, and ruchikaran properties so they inhibit agnimandya in *pandu roga* and due to this proper formation of "ahararasa" and also "rasadhatu" happens, which is most important in sampraptibhanga of *pandu roga*. Mostly all contents of *dadimadi ghrita* are pittashamak. They improve function of ranjakagni and help in the formation of "rasadisaptadhatus." Dadim is mentioned as hridya and shonitasthapan. Thus, it not only

increases the amount of blood but acts as a "rasayana" for whole body. For group I, "*dadimadi ghrita*" was selected, which was mentioned by "charakacharya" in his charakasamhita chikitsasthan in *pandu roga* chikitsa adhyaya. This Ayurvedic preparation may prevent the common hazards of oral iron therapy like gastric irritation, dyspepsia, constipation, or nausea.

## AIMS AND OBJECTIVES

- To access the efficacy of *dadimadi ghrita* in patients of *pandu roga*.
- To compare the results of *dadimadi ghrita* with ferrous fumarate (capsule Autrin) in patients of pandu (hypochromic microcytic anemia).

## MATERIALS AND METHODS

### Selection of Patients

Patients were selected from OPD and IPD of Kayachikitsa Department of Ayurvedic Hospital which is with a part of Ayurvedic College. Sixty patients of *pandu roga* were randomly selected from the OPD and IPD of the study center and were divided into two groups, each group having 30 patients.

Group I patients were administered "*dadimadi ghrita*" orally for 1 month and group II patients were given capsule Autrin for the same duration. Clearance from institutional committee was taken. An informed written consent of patients was taken informing them of the disease and line of treatment.

### Inclusive Criteria

- Primarily, the patients were selected based on the presence of classical symptomatology with some modern parameters of *pandu roga*
- Age: 12 to 60 years
- Sex: Both male and female
- Caste: Irrespective of caste
- Socioeconomic status: All
- Hb level
  - For males: 8 to <13 gm%
  - For females: 8 to <12 gm%
- Peripheral smear showing hypochromic microcytic anemia.

### Exclusive Criteria

- Patients suffering from acquired immunodeficiency syndrome, cancer, hematological malignancies, cardiovascular disorders, hypovolemic shock, renal failure, tuberculosis, etc.
- Patients suffering from acute blood loss or hemolysis
- Pregnancy
- Age below 12 years and above 60 years
- Patients suffering from thalassemia and sideroblastic anemia.

### Criteria of Diagnosis

The diagnosis of hypochromic microcytic anemia is done based on pathological investigation.

The pathological investigations are as follows:

- Hb%
- Complete blood count
- Peripheral smear:
  - Investigations are done before and after treatment.
  - Other investigations will be done to rule out any serious illness if any.

### Preparation of Drug

Preparation of *dadimadi ghrita*

- Dadimbeeja (*Punica granatum*): 1 kudava = 160 gm
- Dhanyaka (*Coriandrum sativum*): ½ kudava = 80 gm
- Chitrakmula (*Plumbago zeylanica*): 1 pala = 40 gm
- Pippali (*Piper longum*) :1 asthayamika = 20 gm
- Shunthi (*Zingiber officinale*) :1 pala = 40 gm

Mix all the above and make its kalka by adding water.

- Goghrita (ghee): 20 pala = 800 gm
- Water: 1 adhaka = 2,560 mL

Add above kalka, ghrita, and water. Heat it with constant stirring on low flame. Observe the boiling mixture for subsidence of froth (phenshanti) and constantly checked the kalka for formation of varti to flame and confirm the absence of crackling sound, indicating absence of hot moisture. Stop heating when a kalka formed a varti and froth subsided, filtered through a muslin cloth, and allowed to cool. This is the preparation of *dadimadi ghrita*.

### Sneha Siddhi Lakshanam

- The snehakalka become "vartivat," i.e., when we pressed on kalka, the fin reprints are marked on it.
- Burning of kalka without any voice when in contact with flame. It is suggested that there is no quantity of water remaining in sneha.
- Fenashanti is specific criteria for ghritapaka.
- Proper ghadh varna rasotpatti.

All the drugs, i.e., raw materials required for ghrita preparation, are identified by teachers of Dravyaguna Department. Preparation of drug is done in Rasashala of Bhaishajya and Rasashastra Department of the same study center.

### Treatment Protocol

#### *Group I*

- Drug name: *Dadimadi ghrita*
- Dose: 20 mL/day

- Anupan: Koshna Jala
- Bheshaja sevana kala: in the afternoon before meal
- Duration of treatment: 4 weeks
- Follow-up: On 7th, 14th, 21st, and 28th day, i.e., after each week

### *Group II*

- Drug name: capsule Autrin
- Dose: 1 capsule daily
- Anupan: Water
- Bheshaj sevana kala: with or after meal
- Duration of treatment: 4 weeks
- Follow-up: On 7th, 14th, 21st, and 28th day, i.e., after each week

## Criteria for Assessment

The criteria of assessment to evaluate effect of *dadimadi ghrita* and capsule Autrin are:

- Clinical parameters (Subjective assessment).
- Investigational parameters (Objective assessment)

### *Subjective Assessment*

The patients presenting following signs and symptoms according to "charak samhita" have been selected for the present study.

Subjective and objective parameters were assessed with the help of specially prepared grade scores.

The grade score pattern is shown in Table 1.

## Criteria for Assessment of Results

The improvement in the patient was assessed mainly based on the points given below:

- Increasing percentage of the Hb.
- Improvement in the signs and symptoms of the disease.
- Improvement in the general health and other biological parameters.

The final results of the patients were divided into four groups.

1. Cured:
   Patients who have got complete or above 75% relief in signs and symptoms and increase in Hb by 1.5 gm% or more than 1.5 gm were included in this group.
2. Moderate improvement:
   Patients who have got 50 to 75% relief in signs and symptoms and increase in Hb% by 1 to 1.5 gm% were included in this group.
3. Mild improvement:
   The patients who have got 25 to 50% relief in signs and symptoms and increase in Hb by 0.5 to 1.0 gm% were included in this group.
4. No improvement.

## Statistical Analysis

The main objective of the present clinical study is to compare the clinical effects of "*dadimadi ghrita*" and "capsule Autrin" in *pandu roga*.

After complete clinical trials, the subjective and objective parameters before and after treatment were recorded for final analysis.

To see the efficacy of each drug on separate group, paired t-test was applied for all symptoms (Tables 2 and 3). For comparative study of both drugs, unpaired t-test was applied (Table 4). To study the overall effect of therapy, chi-square test was applied (Table 5).

The level of $p < 0.05$ was considered as statistically significant and interpreted accordingly. Statistical Package for the Social Sciences software was used for statistical analysis.

For objective assessment, mainly Hb% was considered.

**Table 1:** The grade score pattern

| *Signs and symptoms* | *Grade score* | | | |
|---|---|---|---|---|
| | *0* | *1* | *2* | *3* |
| Daurbalya | Not present | After heavy work relieved soon and tolerate | After little work relieved later | After little work relieved later but beyond tolerant |
| Panduta | Absent | At Nakha and Netra | At Nakha, Netra, and Twacha | At Nakha, Netra, Twacha, Jivha, and Hastapadatal |
| Shwas | Not present | After heavy work, relieved soon and tolerant | After little work, relieved later beyond tolerant | Even in resting conditions |
| Shunakshikuta | Absent | Mild | Moderate | Severe |
| Annadwesha | Absent | Loss of relish to the food | Repulsion toward food | Nausea even after the smell of food |
| Hatanala | No | 3 chapatis, dal/each meal | 2 chapatis, dal/each meal | 1 chapati, dal/each meal |
| Shrama, Bhrama | Not present | After moderate work relieved soon and tolerant | After little work relieved later | Bhrama even in resting condition |
| Hridayspandan | Not present | After heavy work relieved soon and tolerant | After little work relieved later beyond tolerant | Hridayspandan even in resting condition |

## RESULTS

Symptoms: Result after applying t-test

- Daurbalya: Both the treatments are equally effective.
- Panduta: Both the treatments are equally effective.
- Shwas: Both the treatments are equally effective.
- Shunakshikuta: Both the treatments are equally effective.
- Annadwesha: *Dadimadi ghrita* is more effective than capsule Autrin.
- Hatanala: *Dadimadi ghrita* is more effective than capsule Autrin.
- Bhrama: Both the treatments are equally effective.
- Hridayspandan: Both the treatments are equally effective.
- Hb%: *Dadimadi ghrita* is more effective than capsule Autrin.

### Effect of Therapy

In group I, 6.33% of patients show no improvements, 40.33% of patients show mild improvement, 36.67% of patients show moderate improvements, and 16.67% of patients show complete relief.

**Table 2:** Effect of treatment on signs and symptoms in patients of group I (paired t-test)

| *Signs, symptoms, and investigations* | *No.* | *Mean* | *Standard deviation* | *Standard error mean* | *95% confidence interval of the difference* | | *t-value* | *Degree of freedom* | *p-value* |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Lower* | *Upper* | | | |
| Daurbalya | 30 | 1.033 | 0.490 | 0.089 | 0.850 | 1.216 | 11.547 | 29 | <0.05 |
| Panduta | 30 | 0.233 | 0.430 | 0.079 | 0.073 | 0.394 | 2.971 | 29 | <0.05 |
| Shwas | 30 | 0.400 | 0.498 | 0.091 | 0.214 | 0.586 | 4.397 | 29 | <0.05 |
| Shunakshikuta | 30 | 0.200 | 0.407 | 0.074 | 0.048 | 0.352 | 2.693 | 29 | <0.05 |
| Annadwesha | 30 | 1.833 | 0.791 | 0.145 | 1.538 | 2.129 | 12.687 | 29 | <0.05 |
| Hatanala | 30 | 1.633 | 0.615 | 0.112 | 1.404 | 1.863 | 14.548 | 29 | <0.05 |
| Shrama/Bhrama | 30 | 0.700000 | 0.53498 | 0.09767 | 0.50023 | 0.89977 | 7.167 | 29 | <0.05 |
| Hridayspandan | 30 | 0.367 | 0.490 | 0.089 | 0.184 | 0.550 | 4.097 | 29 | <0.05 |
| Hb% | 30 | −0.0787 | 0.402 | 0.073 | −0.937 | −0.036 | −10.709 | 29 | <0.05 |

**Table 3:** Effect of treatment on signs and symptoms in patients of group II (paired t-test)

| *Signs, symptoms, and investigations* | *No.* | *Mean* | *Standard deviation* | *Standard error mean* | *95% confidence interval of the difference* | | *t-value* | *Degree of freedom* | *p-value* |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Lower* | *Upper* | | | |
| Daurbalya | 30 | 0.867 | 0.507 | 0.093 | 0.677 | 1.056 | 9.355 | 29 | <0.05 |
| Panduta | 30 | 1.633 | 0.615 | 0.112 | 1.404 | 1.863 | 14.548 | 29 | <0.05 |
| Shwas | 30 | 0.333 | 0.479 | 0.087 | 0.1543 | 0.5123 | 3.808 | 29 | <0.05 |
| Shunakshikuta | 30 | 0.133 | 0.345 | 0.063 | 0.0042 | 0.2624 | 2.112 | 29 | <0.05 |
| Annadwesha | 30 | 0.933 | 0.583 | 0.106 | 0.715 | 1.151 | 8.764 | 29 | <0.05 |
| Hatanala | 30 | 0.766 | 0.568 | 0.103 | 0.554 | 0.978 | 7.389 | 29 | <0.05 |
| Shrama, Bhrama | 30 | 0.70 | 0.534 | 0.97 | 0.50 | 0.89 | 7.167 | 29 | <0.05 |
| Hridayspandan | 30 | 0.333 | 0.479 | 0.087 | 0.154 | 0.512 | 3.808 | 29 | <0.05 |
| Hb% | 30 | −1.063 | 0.63 | 0.661 | −1.198 | −0.927 | −16.069 | 29 | <0.05 |

**Table 4:** Comparative study of both drugs (unpaired t-test)

| | *t-test for equality of means* | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | *95% confidence interval of difference* | |
| *Signs, symptoms, and investigations* | *t-value* | *Degree of freedom* | *p-values Sig. (2-tailed)* | *Mean difference* | *Standard error mean* | *Lower* | *Upper* |
| Daurbalya equal variances assumed | −1.294 | 58 | 0.201 | −0.167 | 0.129 | −0.424 | 0.091 |
| Panduta equal variances assumed | −0.308 | 58 | 0.759 | −0.033 | 0.108 | −0.250 | 0.183 |
| Shwas equal variances assumed | −0.528 | 58 | 0.599 | −0.067 | 0.126 | −0.319 | 0.186 |
| Shunakshikuta equal variances assumed | −0.684 | 58 | 0.497 | −0.067 | 0.097 | −0.262 | 0.128 |
| Annadwesha equal variances assumed | −5.014 | 58 | 0.000 | −0.900 | 0.180 | −1.259 | −0.541 |
| Hatanala equal variances assumed | −5.669 | 58 | 0.000 | −0.867 | 0.153 | −1.173 | −0.561 |
| Shrama, Bhrama equal variances assumed | −0.759 | 58 | 0.451 | −0.100 | 0.132 | −0.364 | 0.164 |
| Hridayspandan equal variances assumed | −0.266 | 58 | 0.791 | −0.033 | 0.125 | −0.284 | 0.217 |
| Hb% equal variances assumed | −2.798 | 58 | 0.007 | −0.277 | 0.099 | −0.475 | −0.078 |

**Table 5:** Total evaluation of both treatments with chi-square test

| *Group* | *No relief* | | *Mild relief* | | *Moderate relief* | | *Complete relief* | | *Total* |
|---|---|---|---|---|---|---|---|---|---|
| Group I | 2 | 6% | 12 | 40% | 11 | 36.67% | 5 | 16.67% | 30 |
| Group II | 1 | 3% | 9 | 30% | 15 | 50% | 5 | 16.67% | 30 |
| Total | 3 | 9% | 21 | 70% | 26 | 86.67% | 10 | 33.33% | 60 |

Chi-square = 1.377; dF = 3; Significance level = p = 0.7109; as p > 0.05%, there is no association. The null hypothesis is accepted. Thus, both the treatments are equally effective

In group II, 3% of patients show no improvement, 30.36% of patients show mild improvement, 50% of patients show moderate relief, and 16.67% of patients show complete relief.

## DISCUSSION

In assessing the overall effect of therapy, it was seen that best results were obtained in both the trial group and the control group in the form of better statistical significance and percentage relief. The present study reveals that the selected management has potential effect on *pandu roga* with the added advantage of being free from side effects.

## SUGGESTIONS FOR FURTHER RESEARCHES

Since this is the first attempt to manage *pandu roga* with such combination as yoga, it is recommended that the study should be carried out in a large number of patients to evaluate and analyze the results.

The drug administration should be done for longer duration for better results. As *pandu roga* may be a chronic disease, follow-up should be kept for a longer duration. Maximum objective parameters and higher investigations should be incorporated in the study.

## CONCLUSION

Patients of both the groups show significant improvement in their signs and symptoms and investigational parameters. *Dadimadi ghrita* shows significant results in symptoms of agnimandya, annadwesha and to increase Hb%. According to chi-square test, it is concluded that both the treatments are equally effective.

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