



A clinical study to assess efficacy of *rasapachaka kashaya* in *rasapradoshaja vyadhi - panduroga* (iron deficiency anaemia) in females in reproductive age

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Abstract:

Background: *Pandu* is a *Rasa Pradoshaja*

Vyadhi described by *Acharya Charaka*.

Pandu causes extreme debility as it is

dominated by the symptoms like

Palpitation, Fatigue, Dyspnoea on exertion

etc, due to the vitiation of *Rasa* and *Rakta*

Dhatu, which are the essential factors for

nourishment of body. There is a correlation

of *Pandu* with Anaemia of Modern

science. Females in reproductive age are

more susceptible for Iron Deficiency

Anaemia due to regular menstrual flow and

dietary inadequacies and ultimately suffer

complications in pregnancy as well in

delivery. The present clinical study was

conducted to assess efficacy of

Rasapachaka Kashaya in *Rasapradoshaja*

Vyadhi - Panduroga (Iron Deficiency

Anaemia) in females in reproductive age.

Methods: Total 30 female patients of

Panduroga in the age group 18-45 years

were selected randomly. The study

subjects were given *Rasapachaka Kashaya*

in the dose of 1 gm twice a day after

meals. Total study duration was of 90 days

and assessment was done before initiation

of study and at the end of every month.

Results: The relief in symptom scores such

as *Panduta* (Pallor), *Hrutspandan*

(Palpitation), *Shunakshikut* (Periorbital

oedema), *Daurbalya* (Weakness), *Hatanal*

(Loss of Appetite), *Arohanayas*

(Exhaustion during climbing),

Pindikodveshta (Calf muscle cramp),

Aruchi (Anorexia), *Shrama* (fatigue),

Bhrama (giddiness) and *Nidralu*

(Sleepiness) symptom was statistically

significant ($p < 0.01$).

Statistically significant difference was

observed in objective parameters such as

Haemoglobin level and RBC count ($p <$

0.05 and < 0.001 respectively) also in PCV

and MCMC after 3 months of treatment.

No significant improvement was noticed in blood indices such as MCV and MCH. WBC count found to be improved to significant level whereas ESR showed decline to statistically significant level. No significant change in Platelet count was seen over a period of three months, i. e. completion of treatment.

Conclusion: The *Rasapachaka Kashaya* is found to be effective in the management of *Rasapradoshaja Vyadhi– Panduroga* in females in reproductive age.

Key-words: *Rasapradoshaja Vyadhi, Panduroga, Rasapachaka Kashaya*

Introduction:

Dhatu are the vital elements of body. *Dhatu Pradoshaja Vikara* is a condition in which the *Dhatu* are in vitiated state. *Acharya Charaka* has devoted a special chapter on the concept of *DhatuPradoshajaVikaras* in *Sutrasthana*. Among these *Dhatu Pradoshaja Vyadhi, Pandu* is a *Rasa Pradoshaja Vyadhi* described by *Acharya Charaka*.¹ It is characterized by pallor of the body.

Pandu causes extreme debility as it is dominated by the symptoms like Palpitation, Fatigue, Dyspnoea on exertion etc, due to the vitiation of *Rasa* and *Rakta Dhatu*, which are the essential factors for nourishment of body.²

Rasa Dhatu is considered as *Tarpankarka&Pushtikarka* for *RaktaDhatu*.³ It is clear that *Pandu* occurs

due to improper functioning of *Rasa* leading to malnourishment of the body and deterioration of other *Dhatus* like *Rakta, Mamsa, Meda* etc. In Ayurvedic classics *Rakta* has been considered as the key factor for *Jeevana, Prinana, Dharana, & Poshana* Karma of the Body.⁴

This description avails the correlation of *Pandu* with Anaemia of Modern science. Anaemia is considered as a blood disorder characterized by low Haemoglobin (Hb gm%) level. Hb is Iron bearing protein in Red Blood Cells, which delivers oxygen to tissues throughout the Body. Iron is a mineral that is essential for proper growth & for performing various vital function of the body.

As per the World Health Organization's (WHO's) report, there are about two billion anemia cases globally, of which half of them are IDA. It is a serious health problem as it causes general debility, lethargy, lassitude, suboptimal work performance and in certain situations mental retardation, poor intelligence and abnormal immune response.⁵

Anemia is the late indicator of iron deficiency in the human body, hence the prevalence of iron deficiency is estimated 2.5 times higher than that of anemia. IDA during pregnancy is associated with maternal mortality, preterm labor, low birth weight, and infant mortality.⁶ IDA among children affects their cognitive and

motor development and increases the susceptibility of infections.⁷Females in reproductive age are more susceptible for Iron Deficiency Anaemia due to regular menstrual flow and dietary inadequacies. Due to Anaemia, these females suffer complications in pregnancy as well in delivery.

Modern Medicine can effectively treat Acute Anemia, but still the pitfall for management of chronic deficiency anemia exists. This type of chronic disease can be managed by *Ayurveda* successfully. As evident from the research studies undertaken on this topic.

Signs and Symptoms of *Pandu* and Iron deficiency anemia are comparable to a great extent. Iron and nutritional therapy is but one aspect of its treatment. The *Samprapti* of *Pandu* lays a great emphasis upon involvement of *Rasa Dhatu* and *Dhatwagni*. Its *Samyavastha* is crucial in treatment of *Pandu*. *Acharya Charaka* has mentioned *Dhatupachaka Kashaya* in *Jwarachikitsa Adhayaya* of *Chikitsa Sthana* for all the *DhatugatJwara*, wherein *Rasapachaka Kashaya* for the treatment of *Rasagata Jwara* zai.e. *SantatJwara*.⁸*Pandu* is counted as *Rasapradoshaja Vyadhi* by *Acharya Charaka*. As per extension of reasoning, *Rasapachaka Kashaya* can be used for treatment of the same. For better patient compliance, *Rasapachaka Kashaya*

was converted to tablet form and used as study drug.

In the study, Total 30 female patients of *Panduroga* were selected randomly in the age group 18-45 years irrespective of their socio-economic status. The patients were given *Rasapachaka Kashaya* in the dose of 1 gm twice a day after meals. Total study duration was of 90 days and assessment was done before initiation of study and at the end of every month (Day 0, Day 30, Day 60 and Day 90).

Thus, the present study entitled “**A Clinical Study to Assess Efficacy of *Rasapachaka Kashaya* in *Rasapradoshaja Vyadhi - Panduroga (Iron Deficiency Anaemia)*”**”; emphasizes on conceptual aspects of *Pandu Vyadhi* (Iron Deficiency Anemia) as well as clinical study of *Rasapachaka Kashaya* in its treatment.

Materials and Methods:

The present study was Single Arm, Prospective, and Interventional Study. 30 female patients showing signs and symptoms of *Pandu*, between the age group of 18 to 50 years were selected, irrespective of sex and religion from OPD & IPD of concerned Ayurvedic Hospital.

Selection of patients-

Inclusion Criteria: Females in the age group between 18-45 yrs, having Blood Haemoglobin levels between 8 to 10 gm% and without any other acute or chronic major illness.

Exclusion Criteria: Females having any major illness like Cancer, Tuberculosis and such others and Any bleeding disorders such as Internal bleeding, Haemorrhoid, Menorrhagia, pregnant ladies and lactating mothers were excluded from the study.

Ingredients of *RasapachakKashay* i.e. *Kalingaka*, *PatolPatra*, *Katurohini* were sourced from local drug vendor. Authentication and identification of drugs were done in Department of Dravyaguna Vigyan of concerned Ayurvedic College. For the sake of patient compliance, Preparation of *Rasapachak Kashaya* has been done as per scientific and authentic method according to *Sharangdhar Samhita*. Dried seeds of Kutaja, Dried leaves of Patola, Dried rhizomes of Kutaki were collected. The *Rasapachak Kashay* was prepared by using equal quantity of ingredients in the form of *bharad* powder. Then this *bharad* powder was added into 16 times of water. The whole preparation was boiled till 1/4th part of the decoction remains. After making it lukewarm, the decoction was filtered. Thus, *Rasapachak Kashay* was prepared. *RasapachakKashaya* was converted to tablet form in teaching pharmacy of Ayurvedic college by API approved methods. Standardization of tablets was done in authentic laboratory.

Diagnostic Criteria for Pandu-Roga:

For the diagnosis of *Pandu-Roga* whole importance was given to the pathological investigation and symptoms of *Panduroga*.

Laboratory Investigations-

- RBC
- Haemoglobin level
- WBC
- RBC Indices: PCV, MCV, MCH, MCHC
- Platelet Count
- ESR

Symptoms of *Pandu-Roga* like *Panduta* (pallor), *Hrutspandan* (palpitation), *Shunakshikut* (periorbital oedema), *Durbal* (weakness), *Hatanal* (Loss of Appetite), *Arohanayas* (exhaustion during climbing), *Pindikodvesht* (calf muscle cramp), *Aruchi* (Anorexia), *Shrama* (fatigue), *Bhrama* (giddiness), *Nidralu* (always want to sleep) Ethical committee clearance was taken from the institutional Ethics Committee. Written informed consent of the subject was taken prior to the study. The assessment of study subjects was done by specially designed case record form.

Plan of Study: The total number of subjects was 30 and *RasapachakaKashaya* was given in a dose of 1 gm (4 tablets of 250 mg of active ingredients) twice a day for 3 months. Pathological Investigations were done to assess the effect of *RasapachakKashay* before and after the

administration of *RasapachakaKashay*. Follow up was carried out after every month i.e. 2 times in three months.

Criteria of Assessment:

The assessment of result was based on subjective and clinical improvement which includes the observation of patients and assessment of physician during the trial.

According the signs and symptoms the parameters were as follows:

Symptomatic Assessment of Study Subjects of *Pandu-Roga* (Iron Deficiency Anaemia)

Panduta (pallor), *Hrutspandan* (palpitation), *Shunakshikut* (periorbital oedema), *Durbal* (weakness), *Hatanal* (Loss of Appetite), *Arohanayas* (exhaustion during climbing), *Pindikodvesht* (calf muscle cramp), *Aruchi* (Anorexia), *Shrama* (fatigue), *Bhrama* (giddiness), *Nidralu* (always want to sleep)

Grades- 0 – Absent, 1 – Mild, 2 – Moderate, 3- Severe

Assessment of Haematological Parameters of Study Subjects of *Pandu-Roga* (Iron Deficiency Anaemia):

RBC, Haemoglobin level, WBC, RBC Indices: PCV, MCV, MCH, MCHC, Platelet Count and ESR

Plan for Statistical Analysis:

The study data generated and collected was put to statistical analysis to reach to the final results and conclusions. The demographic data were presented in tables

and graphs. The data obtained in the studies were subjected to tests of significance. GraphPad InStat (www.graphpad.com) software was used for statistical analysis of data.

Results:

A) Demographic Details:

Age: Out of the 30 subjects of *Pandu*, 12 study subjects (40%) were in the age group of 30- 40 years, 10 study subjects (33.33%) were in 40-45 years age group. Whereas, 08 study subjects (26.67%) were in the age group of 18- 30 years. **Religion:** Out of 30 study subjects enrolled in the study, 27 (90%) study subjects belonged to Hindu religion, 01 (3.33%) to Muslim religion whereas 02 (6.67%) individuals belonged to *Bauddha* religion. **Occupation:** Out of 30 study subjects enrolled in the study, 11 (36.67%) subjects were doing labour work, 11 (36.67%) subjects were housewives whereas 04 (13.33%) study subjects were shopkeepers. 02 (6.67%) were teachers whereas 01 (3.33%) study subject was factory worker. In India, housewives have more physical work and inadequate diet. Also, laborers may be included in lower socio economic category and they are more prone to this disease due to malnutrition. **Diet:** Out of 30 study subjects enrolled in the study, 24 (80%) subjects were having mixed diet whereas only 06 (20%) individuals were habituated to vegetarian

diet. Due to small sample size, no conclusion can be drawn. **Prakriti:** Out of 30 study subjects enrolled in the study, maximum study subjects i. e. 17 (56.67%) were of *Vata-Pittaprakriti*, 08 (26.67%) study subjects were of *Pitta-Kaphaprakriti*. whereas; only 05 (16.67%) study subjects were of *Vata-Kaphaprakriti*. This observation has a clinical significance as the persons with *Vata-Pittaprakriti* are naturally more prone to the vitiation of *Vata* and *Pitta*. **Agni:** Out of 30 study subjects enrolled in the study, maximum study subjects i. e. 20 (66.67%) had *Mandagni* whereas 10 (26.67%) study subjects had *Vishamagni*. No study subject had *Teekshnagni*. *Mandagni* and *Vishamagni* create *Ama* production and improper *Rasadhatu* formation which is the foremost step in development of *Pandu*. **Koshtha:** Out of 30 study subjects enrolled in the study, maximum study subjects i. e. 15 (50%) had *KrooraKoshtha*, 08 (26.67%) study subjects had *Mridu Koshtha*. Whereas only 07 (16.67%) study subjects had *Madhyama Koshtha*. *Krurakoshtha* has dominancy of *Vatadosha* in *Mahasrotas* and improper digestion which leads to *Pandu*.

B) Clinical Assessment-

Clinical assessment was done at every follow up of one week for assessment of

the improvement in signs & symptoms. For the assessment of study subjects, the specific criteria were used. On the basis of those criteria the statistical analysis of improvement in symptoms & signs was done. 90.14% relief was observed in *Panduta* (Pallor) symptom which was statistically significant too ($p < 0.001$). 78.33% relief was observed in *Hrutspondan* (Palpitation) symptom which was statistically significant too ($p < 0.001$). 88.98% relief was observed in *Shunakshikut* (Periorbital oedema) symptom which was statistically significant too ($p < 0.01$). 75.86% relief was observed in *Daurbalya* (Weakness) symptom which was statistically significant too ($p < 0.001$). 69.23% relief was observed in *Hatanal* (Loss of Appetite) symptom which was statistically significant too ($p < 0.001$). 84% relief was observed in *Arohanayas* (Exhaustion during climbing) symptom which was statistically significant too ($p < 0.001$). 84% relief was observed in *Pindikodveshta* (Calf muscle cramp) symptom which was statistically significant too ($p < 0.001$). 68.29% relief was observed in *Aruchi* (Anorexia) symptom which was statistically significant too ($p < 0.001$). 84.91% relief was observed in *Shrama* (fatigue) symptom which was statistically significant too ($p < 0.001$). 63.14% relief was observed in *Bhrama* (giddiness)

symptom which was statistically significant too ($p < 0.001$). 61.11% relief was observed in *Nidralu* (Sleepiness) symptom which was statistically significant too ($p < 0.001$).

In the assessment of objective criteria, after the intervention for 3 months in 30 study subjects suffering from *Panduroga* (Iron Deficiency Anaemia), statistically significant difference was observed in objective parameters such as haemoglobin level and RBC count ($p < 0.05$ and < 0.001 respectively). Statistically significant improvement was observed in blood indices such as PCV and MCMC after 3 months of treatment. No significant improvement was noticed in blood indices such as MCV and MCH. WBC count found to be improved to significant level whereas ESR showed decline to statistically significant level. No significant change in Platelet count was seen over a period of three months, i. e. completion of treatment.

C) Overall Assessment of Therapy:

From the statistical analysis, it was concluded that the *Rasapachaka Kashaya* was found to improve subjective and objective criteria of assessment for treatment of *Pandu* significantly. Not a single adverse event reported in any of the study subjects during or after the study.

Discussion:

Pandu Roga can be effectively compared with Anaemia on the ground of its similar signs & symptoms. The term Anaemia can be taken under the broad umbrella of *Pandu*. Also, *Pandu* is considered as a *Rasapradoshaja Vikara*. Due to vitiated *Kapha*, there is *Aamotpatti* and *Mandagni* leading to malabsorption of essential nutrients which leads to manifestation of Anaemia.

The existing protocol for management of Anemia solely depends on Iron supplementation. But the non optimal results achieved call for the review of some basic considerations. Formulations mentioned in the context of *Pandu* contain herbal ingredients that are known correctors of the metabolism and enhancers of bioavailability of nutrients irrespective of the factor whether they contain metallic Iron or not. 102 formulations are mentioned in the treatment of *Pandu* in Ayurvedic Formulary of India among which 72 does not contain metallic Iron. All these indicate that more emphasis was given in the text books of Ayurveda for factors affecting metabolism, perhaps including that than Iron supplementation in the management of *Pandu*.

Considering all these facts, *Rasapachaka Kashaya* was selected, which can improve

the metabolism & Agni & thus improve the *Pandu*. Acharya Charaka has mentioned *Dhatupachaka Kashaya* in *Jwarachikitsa Adhayay* of *Chikitsa-Sthana* for all the *Dhatugata Jwara*, wherein *Rasapachaka Kashaya* for the treatment of *Rasagata Jwara* i.e. *Santat Jwara*. As per extension of reasoning, *RasaPachaka Kashaya* was considered for treatment of the *Pandu*. For better patient compliance, *Rasapachaka Kashaya* was converted to tablet form and used as study drug.

Rasapachaka Kashaya was found to be effective in *Panduroga* as significant improvement was noted in haematological parameters such as – Haemoglobin, RBCs, PCV, MCHC and WBCs which statistically significant too. *Rasapachaka Kashaya* having with predominance of *Tiktarasa* and *Ushnaveerya* improves the *Rasa-Dhatvagni* thus improves the quality of *Rasa-Dhatu* and improves the quality and quantity of *Rakta-Dhatu*. *RasapachakaKashaya* improves the *Dhatvagni*, and thus relieves the symptoms of *Panduroga*. No complications were observed in this study.

Probable mode of action of *Rasapachaka Kashaya*-

DhatuPachaka Yoga are polyherbal formulations mentioned in the *Charaka Samhita* and *Ashtanga Hridaya* in the *Jwara Adhikara*. However, the importance

of the five *Dhatupachaka Yoga* is not only confined to *Vishama Jwara*, but is used widely by physicians all over in the form of *Churna- Vati-Kwath* to treat various other diseases. The main action of *Rasa Dhatu* is to provide nourishment to the body. Due to vitiation of *Rasa Dhatu* in *Santata Jwara* this action is hampered.⁹ Improperly formed *Rasa Dhatu* is also a chief etiological factor in *Samprapti* of *Pandu*. Thus, *Rasapachaka Kashaya* consisting of *Kalingaka*, *Patola Patra*, *Katurohini* is considered for treatment of *Pandu*. Here, *Kalingaka* is *Agnideepana*, *pachana*, and useful in digestion of *RasagataAma*. *Patola* is useful in *Pitta* and *Kapha Vyadhi* to digest *Doshas*. While, *Katurohini* is especially useful as *Pachana* because of its *Tikta Rasa*. Together, they show a synergistic action as *Jatharagni Deepaka*, *Dhatvagni Deepaka* and *Ama Pachaka*. *Rasapachaka Kashaya* has predominance of *Tikta rasa* and *Ushnaveerya* which improves the *Rasa-Dhatvagni* thus improves the quality of *Rasa-Dhatu* and improves the quality and quantity of *Rakta-Dhatu*. This probably results in better absorption of nutrients from diet and thus proved to be beneficial in treatment of *Pandu Vyadhi* occurred as a *Rasapradoshaja Vikara* in females in reproductive age.

Conclusion:

The *Rasapachaka Kashaya* is found to be effective in the management of *Rasapradoshaja Vyadhi– Panduroga* in females in reproductive age. Not a single adverse event reported in any of the study subjects during or after the study. The study should be conducted in a large sample to get a convenient result. *Rasapachaka Kashaya* along-with or followed by Iron supplements may give better results. The study should be conducted for a longer duration so as to explore the efficacy of *Dhatupachaka Kashaya*.

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