

Clinical Research

Clinical Efficacy of *Panchakola* on *Raktakshaya*Kishor G. Satani, Hitesh A. Vyas¹, Mahesh K. Vyas²

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Abstract

Rakta is considered to be the cause of the origin, maintenance and the destruction of the body. It may be correlated with blood tissue of modern science on the basis of similarities described in both the sciences and so, *Raktakshaya* can be correlated with anemia. The statistical figure shows that more than 50% of Indian population is affected by anemia. Because of *Jatharagnimandya*, *Rakta Dhatvagni* gets disturbed and leads to *Raktakshaya*. Current study was carried out on 46 patients of *Raktakshaya*. Patients were divided into two groups with simple random sampling method. Group A was treated with the *Panchakola* tablet while Group B was considered as placebo group and was given rice powder tablet. Duration of the treatment was 6 weeks. Classical Ayurvedic signs and symptoms of *Raktakshaya* with hematological parameters like hemoglobin (Hb), serum total iron binding capacity (S.TIBC), serum iron, serum ferritin level and blood indices were studied before and after treatment. Group A showed statistically highly significant increase in Hb g% and significant increase in other subjective and objective parameters.

Key words: *Raktakshaya*, *Panchakola* tablet, Anemia

Introduction

Rakta is accepted to be the cause of survival.^[1] It is considered to be the cause of the origin, maintenance and the destruction of the body. Hence, it has been quoted under the *Pranayatana*^[2] as well as *Mula*^[3] of the living body. It is also known as *Jiva* and *Oja* which indicates its importance; its *Kshaya* or diminutions have a great threat to the survival of the human being. *Raktakshaya* is a common condition and signs and symptoms of it can easily be identified. Classical signs and symptoms of *Raktakshaya* like *Amlashita Prarthana*, *Twak Rukshata*, *Glani*, *Panduta*^[4] can be covered under the big umbrella of *Panduroga*.^[5] Acharya Charaka and Sushruta have clearly mentioned that the vitiation of *doshas* causes *Rakta dushti* and thereby, *Twak* becomes pale in color. Acharya Harita clearly indicate decreased blood volume by “*Nayati Rudhirashoshana*”^[6] in *Panduroga*. Same way, *Chakrapanidatta* mentioned that *Raktakshaya* develops due to the diminution of the *Rasa* by the increased *Pitta* or the failure of the *Rasa* to produce the *Rakta poshaka* part.^[7] In this way, having

resemblance with anemia, *Raktakshaya* can be correlated with anemia.^[8] The statistical figure shows that anemia affects an estimated 50% of the population in India.^[9] The prevalence of anemia is slightly higher in younger women less than 25 years of age than in older women and for women who are unmarried than married women. It is considerably higher for rural women (54%) than for urban women (46%) and so, looking towards its prevalence, it is included in national health programme of India.^[10] *Raktakshaya* may be observed as a symptom or an individual disease. As a symptom, it is observed mainly in chronic diseases and external or internal bleeding and it is manifested as an individual disease due to impairment of *Raktadhatvagni*. Poor supplementation of Iron is also one of the major causes for *Raktakshaya*, *Raktakshaya* can also occur due to inadequate absorption or utilization of Iron which can be understood in the terms of *Agnimandya* in *Ayurveda*.^[11] In current study, patients affected by *Raktakshaya* due to impairment of *Raktadhatvagni* were selected and improvement in classical signs and symptoms of *Raktakshaya* and *Agnimandya* were assessed. This study was aimed to evaluate the interrelationship between *Jatharagni* and *Dhatvagni*^[12] as; moieties of *Kayagni*, located in its own place, are distributed to and permeate to all *Dhatus*. A decrease of it (below the normal) makes for an increase of *Dhatus* while an increase of it (above the normal) makes for a decrease of *Dhatus*.^[13] Hence, a drug, *Panchakola* having *Dipana* property has been selected as trial drug for the present study.^[14]

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Materials and Methods

Preparation of drug

Panchakola Churna^[15] and its tablets were prepared in the Pharmacy, Gujarat Ayurved University (GAU), Jamnagar. Pharmacognosy and Analytical study were carried out in the Pharmacognosy laboratory and Pharmaceutical chemistry laboratory of Institute for Post Graduate Teaching and Research in Ayurveda respectively. *Pippali* (*Piper longum* Linn.),^[16] *Pippalimula* (Root of the *Piper longum* Linn.),^[17] *Chavya* (*Piper chaba* Hunter),^[18] *Chitraka* (*Plumbago zeylanica* Linn.)^[19] and *Sunthi* (*Zingiber officinale* Roscoe)^[20] are the ingredients of *Panchakola Churna* [Table 1]. The tablets were given to the patients during middle of a meal.^[21]

Source of data

Total 46 patients of *Raktakshaya* attending outpatient department (OPD) of Basic Principles department, IPGT and RA, GAU, Jamnagar were registered. Classical signs and symptoms of *Raktakshaya*, Hb percentage and blood indices were taken into consideration as criteria of assessment. S. Iron, S. ferritin and S.TIBC were also carried out for treated group patients.

Inclusion criteria

Patients of age between 20 to 60 years presenting with clinical features of *Raktakshaya* like *Amlashita Prarthana* (craving for sour and cold), *Twak Parushya* (roughness of the skin), *Sira Shaitihilya* (loss of the tone of the Sira), *Agnimandya* (diminished appetite), *Daurbalya* (weakness), *Bhrama* (giddiness), *Alpayasena Shwasakashtata* (exertional dyspnea) manifested due to hypo functioning of *Agni* and having Hb value in between the range of 6 and 11.5 gm% with age in between 20 and 60 years were selected for study.

Exclusion criteria

Raktakshaya of external origin or internal bleeding disorders (Srava-janya), individuals suffering from genetic diseases, all types of secondary anemias, patients having Hb <6 g/dl, pregnant and lactating women were excluded from the study.

Ethical clearance

The study was cleared by the ethics committee of the Institute. Written consent was taken from each patient willing to participate before the starting of the study. Patients were free to withdraw their name from the study at any time without giving any reason.

Sampling method

All the selected patients were randomly divided into two groups by simple random sampling method.

Group A was treated with *Panchakola* tablet (treatment

group) and in Group B rice powder tablet (placebo group) was administered. 26 patients were registered in Group A and 20 in Group B. Total 22 patients had completed the course of treatment in Group A, whereas 18 patients completed in Group B.

Posology

Four tablets of *Panchkola* and placebo (500mg each), 3 times middle of a meal for 6 weeks along with water as *Anupana* was given in both the groups.

Assessment criteria

An assessment was made on change in clinical feature before and AT. The scoring was given to each symptom ranging from 0 to 3.

Chief complaints

1. *Amla Shita Prarthana* (desire for sour and cold subjects):
 - 0-Absent
 - 1-Occasional desire to take either *Amla* or *Shita Dravya*
 - 2-Occasional desire to take both *Amla* and *Shita dravya*
 - 3-Always desire for the both *Amla* and *Shita Dravya* that subside on the intake.
2. *Bhrama* (Vertigo):
 - 0-No *Bhrama*
 - 1-sometimes experience mild *Bhrama*, which is not disturbing the regular life
 - 2-Often experience *Bhrama* which needs rest and disturbs routine work
 - 3-Regular *Bhrama*, which needs treatment.
3. *Shirnalomata* (hair fall):
 - 0-No hair fall
 - 1-Hair fall during combing the wet hair after oiling the hair and combing
 - 2-Hair fall during washing the hair and normal combing
 - 3-Hair fall without combing.
4. *Panduta* (pallor):
 - 0-Absent
 - 1-Visible only in the sclera
 - 2-Visible in the sclera and nail both
 - 3-Visible in the above two and face, tongue etc.
5. *Shwasa kashtata* (Exertional Dyspnea)
 - 0-Dyspnea after heavy work, but relieved soon and up to tolerance
 - 1-Dyspnea after moderate work, but relieved later and up to tolerance
 - 2-Dyspnea after little work, but relieved soon and up to tolerance
 - 3-Dyspnea without any work, not relieved and beyond to tolerance.

Overall effect of therapy

To evaluate the overall effect of therapy, first percentage of improvement in each scale is calculated for each patient. Then, an average improvement of each patient is drawn. Total percentage in each category is calculated and presented. Total number of patients are grouped into no change (0-25%), mild improvement (26-50%), moderate improvement (51-75%), marked improvement (76-99%) and complete remission (100%). Later Student's paired *t*-test is applied on above data and final conclusion is drawn.

Table 1: Ingredients of *Panchakola churna*

Sanskrit name	Latin name	Part used	Proportion
<i>Pippali</i>	<i>Piper longum</i> Linn.	Fruit	1 part
<i>Pippalimula</i>	Root of <i>Piper longum</i> Linn.	Root	1 part
<i>Chavya</i>	<i>Piper chaba</i> Hunter.	Root	1 part
<i>Chitraka</i>	<i>Plumbago zeylanica</i> Linn.	Root	1 part
<i>Shunthi</i>	<i>Zingiber officinale</i> Roscoe.	Rhizome	1 part

Patients were advised to avoid heavy diet, contrary foods or stale foods, cold water and sleeping after eating again and again, suppression of natural urges, psychological stress and strain, not to eat before digestion of previously taken food.^[21]

Statistical analysis

The obtained data of observations were analyzed by the Student's paired *t*-test.^[22] (conceded at the level of $P < 0.001$ as highly significant, $P < 0.05$ or $P < 0.01$ as significant and $P < 0.10$, $P > 0.01$, $P > 0.05$ as insignificant).

Observations and Results

Total 46 patients were registered in the present study. Majority of the patients, (50%) were in the age group of 30-39 years. Majority (84.78%) of the patients were females, 56.52% patients had primary education and 52.17% patients were from lower economy group.

In Group A, statistically significant results were found in *Amla Prarthana* (61.90%), *Agnimandya* (61.11%), *Daurbalya* (50%), *Panduta* (30%), *Twak Parushya* (66.67%), *Sira Shaithilya* (60%), *Abhyavaharana Shakti* (63.13%), *Udgara Shuddhi* (59.22%), *Annashraddha* (59.91%), *Klama Parigamana* (46%) [Table 2].

In Group A, statistically significant results were found in objective parameters like; improvement in Hb value was observed by 16.22% and total red blood corpuscular count (57.51%), S.TIBC (6.15%), S. Iron (4.17%), S. ferritin (2.51%) was found [Table 3]. Total improvement observed in Group A (68.42%) was statistically highly significant, while, it was statistically insignificant in Group B with only 26.38% improvement [Table 4]. In Group B, statistically significant results were found in *Daurbalya* (38.24%), *Panduta* (74.71%), *Tamo Darshana* (55.55%) and *Hrida Spandanadhikya* (65.36%).

Rest of all features of *Raktakshaya* and hematological parameters were remained statistically insignificant [Table 3].

In Group A, 12.70% patients had complete remission, followed by 59.18% marked improvement, 14.64% moderate improvement and 9.06% patients had mild improvement. Whereas, in Group B, 16.12% had marked improvement, mild improvement in 22.24%, 18.78% of total patients remained unchanged [Table 5].

Discussion

Raktakshaya is one of the important health issues in India. Among various causes of the ailment, malnutrition is at prime

place. More than 50% of Indian population is affected by this disease. Because of this it is included in the national health program. Many of the patients attending the OPD of any health institute for any disorder found to be anemic. One of the important causes of the disease is poor metabolism and utilization of iron for production of Hb.^[23]

Hypothetically it can be said that improvisation of the *Jatharagni* and *Dhatvagni* would be useful in this condition.

In the present study, majority of patients were having age group of 30-39 years. A maximum of 84.78% female patients were found in this group. Particularly, females of this age are prone for maximum psychological stress, and have to concentrate on their families due to which proper nutritional diet or even regularity to take the diet may be ignored that manifests *Raktakshaya* through hypo functioning of *Agni*. Maximum patients of this study were from lower income group and also having age of 20-40 years.

56.52% patients had primary education. Because of lack of education people were found unaware to the seriousness of the problem and were not following the instructions of their family doctors to have nutritious food or food supplements. Because of low income they were unable to spend money for medicines or food supplements and so, *Raktakshaya* was found maximum in those patients. Maximum patients (32.61%) had *Kapha-Vata Prakriti*. Both of these *Doshas* have nature to vitiate *Agni* either to *Manda* state or to *Vishama* state. As both of these states are abnormal, digestion and absorption of food cannot be done properly.

Due to improper function of *Jatharagni*, *Dhatvagnis* get vitiated which results in decrease of *Dhatu*. 69.48% patients had *Avara Abhyavaharana Shakti*, 67.79% patients had *Avara Jarana Shakti*, 71.74% patients were observed to have the habit of *Atiguru Bhojana*, 65.22% of the total patients were habitual to take *Atisnigdha Bhojana* to be the etiological factors of disease *Raktakshaya* due to *Jatharagnimandya*.

Though the given treatment was not directly affecting the *Raktadhatu*, Group A patients show statistically significant improvement in maximum symptoms of *Raktakshaya*. This proves the hypothesis that improvement in *Jatharagni* helps in correcting *Dhatvagni* and on this line increase, decrease or vitiation of *Dhatu*s can be managed. Significant increase of Hb without giving any iron contained medicine also helps the hypothesis. This proves that corrected *Dhatvagni* converts and combines available iron for the synthesis of Hb effectively. S.TIBC was found significantly increased in treated group, which means in these patients' secretion of transferrine has been

Table 2: Effect of Panchakola tablet on cardinal symptoms of Raktakshaya

Symptoms	N	BT	AT	Mean	% improvement	SD	SE	t	P
<i>Amla Prarthana</i>	22	3.06	0.58	0.11	61.90	2.12	0.43	2.64	<0.01
<i>Shita Prarthana</i>	22	2.65	0.88	0.08	57.69	3.64	0.84	2.09	<0.05
<i>Agnimandya</i>	22	4.71	1.54	0.15	61.11	2.34	0.86	2.50	<0.01
<i>Daurbalya</i>	22	3.12	1.45	1.17	50	1.76	0.52	2.92	<0.01
<i>Panduta</i>	22	1.23	0.44	0.08	30	18.01	5.61	1.88	>0.05
<i>Twak Parushya</i>	22	3.28	0.98	0.10	66.67	2.39	9.28	2.36	<0.05
<i>Sira Shaithilya</i>	22	2.80	1.22	0.15	60	2.40	0.43	2.21	<0.01

BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error; t: Paired t test, P: Probability, N: Total number of patients

Table 3: Effect of *Panchakola* tablet on hematological parameters in patients of *Raktakshaya*

Hematological parameters	N	Mean score		X	% relief	SD	SE	t	P
		BT	AT						
Hb g%	22	8.14	9.46	1.32	16.22	2.44	0.52	2.54	<0.01
TRBC	22	3.13	4.93	1.80	57.51	3.89	0.83	2.17	<0.05
S. TIBC	22	374	397	23.00	6.15	45.73	9.75	2.36	<0.05
S. Iron	22	30	31.32	1.25	4.17	2.30	0.49	2.54	<0.01
S. Ferritin	22	46.83	48	1.17	2.51	1.83	0.39	2.98	<0.01
PCV	22	35.88	37.62	1.42	3.96	2.86	0.61	2.34	<0.01
MCV	22	84.44	86.06	1.62	1.92	2.77	0.59	2.74	<0.01
MCH	22	24.2	25.4	1.20	5.50	2.35	0.5	2.40	<0.05
MCHC	22	32.03	33.2	1.17	09	1.88	0.40	2.92	<0.01
ESR	22	18.78	18.46	0.32	3.24	1.31	0.28	1.14	>0.1

X: Mean, BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error, t: Paired t test, P: Probability, N: Total number of point, Hb: Hemoglobin, TRBC: Total red blood corpuscular count, S.: Serum, S. TIBC: Serum total iron binding capacity, PCV: Packed cell volume, MCV: Mean corpuscular volume, MCHC: Mean corpuscular hemoglobin concentration, ESR: Erythrocyte sedimentation rate

Table 4: Total effect of therapy of 40 patients

Total effect of therapy	N	BT mean	AT mean	X mean difference	% improvement	SD (±)	SE (±)	t	P
Group A	22	17.67	2.87	14.08	68.42	8.16	1.74	8.5	<0.001
Group B	18	16.5	8.78	7.72	26.38	21	4.95	1.56	>0.05

BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error, t: Paired t test, P: Probability, N: Total number of point

Table 5: Result of therapy on individual groups of 40 patients

Result of therapy	Group A		Group B	
	No. of patients	Percentage	No. of patients	Percentage
Complete remission	5	12.70	0	0
Marked improvement	15	59.18	2	16.12
Moderate improvement	3	14.64	9	42.86
Mild improvement	2	9.06	4	22.24
Unchanged	1	4.42	5	18.78

increased significantly. According to modern patho-physiology, this may be interpreted in terms of anemia, particularly due to inadequate supply of iron but according to the *Agni* principle this indicates increase of *Rakta Dhatvagni* as due to increased transferrine iron can be combined and converted into Hb effectively.^[24] This also can be understood in terms of *Raktadhatu Utpatti* and *Poshana*.

The mode of action of the drugs under trial can be understood on the basis of inherent properties of the individual components. All the ingredients of *Panchakola* have *Laghu*, *Ruksha* and *Sukshma* Gunas, *Ushna* Virya, *Katu* Rasa, *Katu* Vipaka and *Pachana*, *Kaphahara* properties. *Rasa* and *Vipaka* of the *Panchakola* are *Katu*, helpful in *Agnidipana*, *Pachana*. Thus, it becomes clear that *Dipana* drugs correct *Agnimandya* and after the ignition of *Jatharagni*; *Amshas* of it located in *Dhatvashayas* also ignited by *Jatharagni*. After the proper channelization of *Rasadi Dhatu Samvahana*, *Raktakshaya* can

be treated. Thus, on the basis of clinical observations it can be said that ignition of *Jatharagni* with *Dipana dravyas* have their effect on *Dhatvagnis* too. This again validates the statement of *Vagbhata* that *Dhatvagnis* are the *Amsha* of *Jatharagni*.

Explanation for discontinuation

In the placebo group, application of rice flour powder tablet didn't give significant improvement was the cause of discontinuation of two patients. In the treatment group, two patients not willing to give a blood sample after 6 weeks of medicine. Therefore, they are considered as discontinued. No feedback available in other as they didn't visit OPD after discontinuation.

Therapeutic untoward effect

In treated group, three patients had complained burning sensation in chest after taking the medicine for a period of one week. Among them, two had *Pitta Prakriti* and these patients had taken the *Panchakola* tablets on empty stomach. After consuming the medicine in between the food, the complaints were subsided.

Conclusions

Jatharagni and *Dhatvagnis* have a definite interrelationship. *Panchakola Churna* shows significant improvement in subjective and objective parameters of *Raktakshaya*. There was no iron contained medicine given to the patients in this study so, it can be concluded that if *Panchakola Churna* would be given before or with iron medicine may show better effect.

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हिन्दी सारांश

पञ्चकोल वटी का रक्तक्षय पर प्रभाव

किशोर जी. सताणी, हितेष ए. व्यास, महेश व्यास

रक्तक्षय आज न केवल विकासशील देशों में किन्तु विकसीत देशों में भी सामान्यतः पाया जानेवाला विकार है। विश्व आरोग्य संस्था के अनुसार दुनियाभर में ५० प्रतिशत से ज्यादा लोग आज रक्तक्षय से पीड़ित हैं। यहाँ पञ्चकोल वटी का अग्रिमांघजनीत रक्तक्षय पर होनेवाले प्रभाव का अनुसंधानात्मक अध्ययन किया गया है। पञ्चकोल वटी वर्ग में पंजीकृत २६ मे से २२ रुग्ण एवं प्लेसीबो टैब्लेट वर्ग में पंजीकृत २० में से १८ रुग्णों ने चिकित्सा पूर्ण की। चिकित्सिय परिणाम को देखने के लिये विशेषतः प्रयोगशालीय परीक्षण जैसे की सीरम आयन, सीरम टी.आइ.बी.सी., सीरम फेरीटीन आदि का वर्ग ड्रअफ के रुग्णों में उपयोग किया गया। इसी प्रकार मुख्य लक्षण एवं सहयोगी लक्षणों पर भी प्रभाव का अध्ययन किया गया। वर्ग ड्रअफ में पञ्चकोल टैब्लेट द्वारा १२.७०% प्रतिशत रुग्णों में संपूर्ण सुधार ५१.१८% प्रतिशत रुग्णों में उत्तम सुधार १४.६४% प्रतिशत में मध्यम सुधार पाया गया। यह प्रभाव सांख्यिकी परीक्षण में अत्यधिक सार्थक था। समूह ड्रअफ में प्लेसीबो टैब्लेट से ४२.८६% प्रतिशत को मध्यम सुधार १६.१२% प्रतिशत को उत्तम सुधार २२.२४% रुग्णों में अल्प सुधार पाया गया।