

## THE EFFECT OF VASTUKA (CHENOPODIUM ALBUM LINN.) ON BLOOD HEMOGLOBIN LEVEL: A RESEARCH STUDY

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### ABSTRACT

Hemoglobin deficiency is a global public health problem affecting both developing and developed countries with major consequences for human health as well as social and economic development. It occurs at all stages of the life cycle, but is more prevalent in pregnant women and young children. On an average, globally 50% of the anemia is assumed to be attributed to iron deficiency. It is very common in rural population due to poverty and inadequate diet. Iron deficiency is primarily caused due to dietary insufficiency; therefore, this study aims to explore locally available dietary iron sources. The central hypothesis of the study being a low cost, locally available and culturally

acceptable dietary substance supplementing adequate iron requirement will have a better chance of compliance in the population. A single blind Study was carried out in OPD patients of DG department of NIA, Jaipur for 30 days. Total 20 apparently healthy volunteers were registered for the trial and treated with *Vastuka* dry powder. The overall clinical improvement was highly significant.

**KEYWORDS:** Hemoglobin, Iron, *Vastuka*.

### INTRODUCTION

*Raj Nighantu* gives an independent position to *Dravyaguna* can be described as comprehensive discipline of *Ayurveda* in which embraces various aspects of knowledge about the identification, collection and classification of drugs, their physical and chemical properties, their uses, dosage and therapeutic actions.<sup>[1]</sup>

Good nutrition is the fundamental basic requirement for positive health, functional efficiency and productivity. Importance of nutrition is not only promoting proper physical growth and development, but also in ensuring adequate immune competence and cognitive development. Good nutritional status is achieved not through drugs, tablets and pills but through well balanced diets. There is no known nutritional deficiency disorder that cannot be prevented by proper diet.

The seven *Dhatu* systems in *Ayurveda* nourish the body. *Raktadhatu* is the second and most important *Dhatu* of the body because all nutrition and pathology occurs through this *Dhatu*.<sup>[2]</sup>

Hb is an integral part of blood. Its chief physiological function is to carry oxygen through blood then to release this oxygen readily in the peripheral tissue capillaries, where the gaseous tension of oxygen is much lower than in the lungs. Hb deficiency is one of the most important health issues concerning global population. Hb contains most of the body iron (66%).<sup>[3]</sup> Therefore iron deficiency is a significant cause for Hb deficiency. Since iron deficiency is one of the main cause of the low Hb level and lack of dietary iron is a commonly seen problem enriching the diet with rich iron source dietary substance can mitigate this problem of iron deficiency. In developing countries like India 30-70% of the population is iron deficient.<sup>[4]</sup> *Ayurveda* opines both the human body and its disease or nothing but outcome of food.<sup>[5]</sup> *Aahara* is quoted as “*Mahabheshajya*”.<sup>[6]</sup>

#### AIMS AND OBJECTIVES OF STUDY

- To evaluate the efficacy of *Vastuka* on blood Hb level.
- To provide management of Iron deficiency through *Ahara*.
- To provide low cost, easily available and effective supplement of iron.

#### MATERIALS AND METHODS

Fresh leaves of *vastuka* were taken and dried under shade for 10 days. These dry leaves were powdered by a pulverizer and were passed through sieve size 80. This powder was then packed in HDPE packs of 100 gms each. Dose of *Vastuka* was 5 gm dry powder twice a day for 30 days. Powder was formulated by scholar himself duration of 30 days with follow up after 15 days.

**Selection of Cases:** 20 apparently healthy consenting volunteers was selected and registered in OPD of NIA, Jaipur.

**Selection of Drug:** *Vastuka* have reported to contain iron 27.48 mg/100 gm.<sup>[7]</sup> *AstangaSamgraha* has described *Vastuka* in *Shakavarga* and state its properties as stool splitting.<sup>[8]</sup>

**Clinical study:** The main object of present research work is to undertake a clinical study of *Vastuka* in apparently healthy volunteers having hemoglobin between 7-11 gm% in females and 9-12 gm% in males to assess clinical efficacy of the trial drug.

**Inclusion Criteria:** Apparently healthy volunteers with age group of 15 -45 years, both sexes and Hb level having between 7-11 gm% in females and 9-12 gm% in males.

**Exclusion Criteria:** persons with below 15 & above 45 years of age, pregnant ladies, patients suffering from malignant diseases like leukemia, hemoglobin less than 7 gm %, suffering from serious diseases such as IHD, CCF and anemia due to causes other than Iron deficiency.

**Criteria of Assessment:** first is subjective criteria- Scoring pattern Adopted for Assessment of Clinical Features.

S. No.	Clinical Features	Grade	Score
1.	Absence of signs and symptoms	-ve	0
2.	Mild signs and symptoms	+ ve	1
3.	Moderate signs and symptoms	+ ve	2
4.	Severe signs and symptoms	+ ve	3

### Parameters

*Parushata, Rukshata, Sphutita, Mlana, Amlashishirapriti, Constipation, Appetite, Dizziness, Palpitation, Headache, Breathlessness, Fatigue Irritability, Angular Stomatitis, Drowsiness.*

### Objective criteria

#### Hematological Assessment

Hematological investigations i.e. Hb % and complete blood count were conducted to evaluate the attribute changes produced by the trial drug given.

#### Statistical Presentation and Analysis

All the signs and symptoms, blood investigations before trial and after trial were compared. Hb gm % was analyzed statistically. Paired “t” test for intra group assessments by Graphpad InStat 3 were used in this study.

## RESULT AND DISCUSSION

### Efficacy of therapy in laboratory investigations in 20 Volunteers.

Laboratory Investigations	Mean		D	Change in %	S.D	S.E	t	p	R
	B.T	A.T							
Hb <sub>gm</sub> %	10.08	11.24	1.16	11.51	0.6556	0.146	7.912	<0.0001	HS
TLC	7215	7300	85	1.17	1323.97	296.05	0.287	0.7771	NS
Neutrophils	64.2	54.35	9.85	15.34	9.5546	2.1364	4.610	0.0002	HS
Lymphocytes	30.65	40.2	9.55	31.15	8.9529	2.0019	4.770	0.0001	HS
Eosinophils	2.55	2.2	0.35	13.72	1.3088	0.2926	1.196	0.2465	NS
Monocytes	2.55	2.8	0.25	9.80	0.71635	0.1601	1.561	0.5266	NS
Basophils	0	0	0	0	0	0	0	>0.05	NS

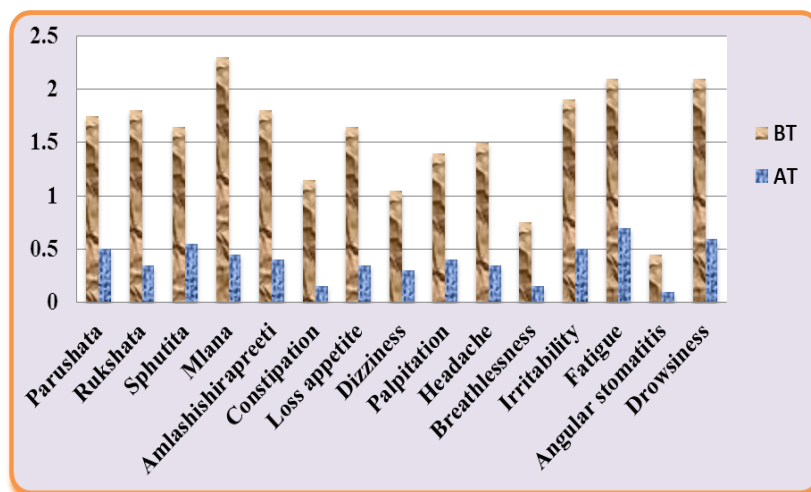
After analysis of above data of Group A, we got that *Hb<sub>gm</sub> %*, *Neutrophils*, *Lymphocytes* shows highly significant results rest of all laboratory investigations shows insignificant results.

### Efficacy of Therapy in sign & symptoms in 20 Volunteers.

Sign & symptoms	Mean		D	Relief in %	S.D	S.E	t	p	R
	B.T	A.T							
<i>Parushata</i>	1.75	0.5	1.25	71.42	0.4442	0.0993	12.583	< 0.0001	HS
<i>Rukshta</i>	1.8	0.35	1.45	80.55	0.6048	0.1352	10.721	< 0.0001	HS
<i>Sphutita</i>	1.65	0.55	1.1	66.66	0.7181	0.1605	6.849	< 0.0001	HS
<i>Mlana</i>	2.3	0.45	1.85	80.43	0.7451	0.1666	11.102	< 0.0001	HS
<i>Amlashishirapreeti</i>	1.8	0.4	1.4	77.77	0.5026	0.1123	12.456	< 0.0001	HS
<i>constipation</i>	1.15	0.15	1	86.95	0.6488	0.1450	6.892	< 0.0001	HS
<i>Loss of Appetite</i>	1.65	0.35	1.3	78.78	0.6569	0.1468	8.849	< 0.0001	HS
<i>Dizziness</i>	1.05	0.3	0.75	71.42	0.4442	0.0993	7.549	< 0.0001	HS
<i>Palpitation</i>	1.4	0.4	1	71.42	0.6488	0.1450	6.892	< 0.0001	HS
<i>Headache</i>	1.5	0.35	1.15	76.66	0.4893	0.1094	10.509	< 0.0001	HS
<i>Breathlessness</i>	0.75	0.15	0.6	80.0	0.5026	0.1123	5.338	0.0005	HS
<i>Irritability</i>	1.9	0.5	1.4	73.68	0.5026	0.1123	12.456	< 0.0001	HS
<i>Fatigue</i>	2.1	0.7	1.4	66.66	0.5026	0.1123	12.456	< 0.0001	HS
<i>Angular stomatitis</i>	0.45	0.1	0.35	77.77	0.4893	0.1094	3.198	0.0156	S
<i>Drowsiness</i>	2.1	0.6	1.5	71.42	0.6069	0.1357	11.051	< 0.0001	HS

After analysis of above data of Group A, we got that the maximum relief in percentage was in *constipation* (86.95%), than in *Rukshta* (80.55%), than in *Mlana* (80.43%), than in *Breathlessness* (80%), than in *Loss of Appetite* (78.78%), than in *Angular stomatitis* (77.77%), *Amlashishirapreeti* (77.77%), than in *Headache* (76.66%) than in *Irritability* (73.68%), *Parushata* (71.42%), *Dizziness* (71.42%), *Palpitation* (71.42%), *Drowsiness* (71.42%) and minimum relief in percentage was in *Sphutita* (66.66%) and in *Fatigue* (66.66%) but statistically *Parushata*, *Rukshta*, *Sphutita*, *Mlana*, *Amlashishirapreeti*, *constipation*, *Loss of Appetite*, *Dizziness*, *Palpitation*, *Headache*, *Breathlessness*, *Irritability*,

*Fatigue, Angular stomatitis and Drowsiness* shows highly significant results and *Angular stomatitis* shows significant results. In the study, average percentage improvement was 75.43% in all signs and symptoms.



### Showing Efficacy of Therapy in Group A in sign & symptoms in 20 Volunteers

**Overall assessment of therapy:** At the end of treatment each volunteer result was carefully observed to assess the overall effect of therapy. Assessment was done on the basis of % improvement grading described in methodology. The overall effect of treatment is as follows: complete Improvement 100%, Improvement 75 – 99%, Partial Improvement 25 – 75%, No Improvement 00 – 25%. Out of 20 Volunteers, 12 (60%), Volunteers achieved Partial Improvement, 8 (40%) Volunteers achieved Improvement and no any volunteer achieved complete Improvement and no Improvement.

### DISCUSSION

*Samanya Vishesh Siddhanta*<sup>[9]</sup> also underlines the fact that absence of obstructing factors is required for the ultimate result. Vitamin C deficiency, *Agnimandhya* etc. decreases iron absorption and utilization in the body. The trial drug *Vastuka* contains Vitamin C.

The trial drug *Vastuka* possesses *Deepan, Pachana* properties i.e. it facilitates digestion and metabolism. *Vastuka* has also have *krimighna* (wormicide) effect and thus can play a role in parasitosis, a cause of iron deficiency. Against these backdrops, the trial drugs were hypothesized to improve the iron and Hb levels in the body.

This signifies that mere presence of two similar substances or attributes will not result in increase. The precondition "*PravritirUbhayasayatu*"<sup>-[10]</sup> i.e. the two similar attributes or

substances should appropriately engage with each other for an effective result. When a drug is administered, it must get into effective physio-pharmacological engagement with the human body to elicit desired actions. The concept of *Dehadesha* is therefore given due importance in Ayurveda. The human body selectively utilizes the materials supplied to it.

*Aahar*, *Nidra* and *Brahamcharya* are the 3 sub pillars of health.<sup>[11]</sup> *Charaka* goes on to state that the health of healthy persons is primarily maintained by *Aahar*.<sup>[12]</sup> Further the human and its disease are nothing but the outcome of the food. *Chakrapani* says *Aahardravyas* are *Rasa pradhana*<sup>[13]</sup> and health is primarily nourished by *Rasadhatu* by following the *UtrottarDhatuposhananyaya*. Therefore a diet is expected to provide better nourishment with respect to a particular nutrient in the healthy persons whereas the body is postulated to reject *AushadhDravyas* when its ingredients are not essentially required by the body. It is also possible that the utilization of nutrients in healthy people happens better through diet than medicine.

The trial drugs contain iron in significant amount. Therefore the trial drug possibly effectuated an increase in iron contents in variable degree on the basis of *SamanyaSidhhanta*. Hb contains most of the body iron (65%), therefore increase in iron leads to in Hb.

## CONCLUSION

- The trial drug *Vastuka*, increased Serum Hb in a statistically significant manner.
- *Vastuka* does not produce any ADRs in the prescribed dose and duration.
- Therefore it is concluded that *Vastuka* when used in Hb deficiency but otherwise healthy population will increase Hb and is a safe and effective dietary substance for correcting Hb deficiency.
- The study also concludes that Hb deficiency can be managed by *Aharaseems* to be the better option in apparently healthy individuals.
- The study reaffirms *Vastuka* as a low cost, safe, effective, easily available and traditionally acceptable dietary means to improve Hb status of the population.

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