

A CLINICAL EFFICACY OF *BRIMHANIYA DASHEMANI* IN SUBJECTS OF *KARSHYA* W.S.R. TO UNDERWEIGHT IN PROMOTING THEIR PHYSICAL HEALTH

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ABSTRACT

Introduction: Growth and development is a physiological process provided, all factors influencing them are healthy. With 102 million men and 101 million women underweight, India leads the world in being home to over 40% of the global underweight population. It continues to have the largest number of underweight people in the world. *Acharya Charaka* have described *atikrusha* person under *Astouninditiya Purushas* and have explained the concept of *Brimhana* and *Brumhana Dravyas* which produces *Stoolata* of body. Hence, the trial was designed to see the efficacy of *Brimhana Dashemani* in subjects of *Karshya* in promoting their physical health. **Methodology:** It was a single arm clinical study where in *Brimhana Dashemani Dravyas* was evaluated for its effectiveness in subjects of *Karshya* in promoting Physical health. 30 patients of either gender were selected using inclusion criteria to the trial. The patients were treated with *Brimhana Khanda*, 12g with 150 ml of milk in divided dose for 90days. The anthropometric measurements like weight, BMI, mid arm circumference, waist circumference and abdominal circumference were noted at 0th, 30th, 60th, 90th and 120th day. Results were analysed for the statistical significance by adopting paired-t-test and multiple ANOVA. **Results:** Results of the clinical trial revealed that the compound drug used was statistically significant in increasing the weight and thus was also significant in promoting the physical health in subjects of *Karshya* i.e. underweight. **Conclusion:** The *Brimhana Khanda* was found to be effective in increasing weight & thus promoting the Physical health.

Keywords: *Brimhana Khanda*, *Karshya*, Physical health, Underweight

INTRODUCTION

Under nutrition is a condition in which there is inadequate consumption, poor absorption or excessive loss of nutrients¹. Their nutritional status is a sensitive indicator of community health and nutrition². Under nutrition impacts in various problems like

weight loss, low energy, muscle wasting, increased risk of fractures, increased risk of hospital admission, confusion, anaemia, infections, reduced independence, reduced mobility, low mood³. India continues to have the largest number of underweight

people in the world, a new study published in The Lancet journal has found. With 102 million men & 101 million women underweight, India leads the world in being home to over 40% of the global underweight population. Nonetheless, underweight remains prevalent in the world's poorest regions, especially in South Asia, it added. The study used data from national and smaller studies representing 19.2 million adults from 186 countries to arrive at its conclusions. It used the standard definitions of underweight (body mass index less than 30kg per sqm). BMI is ratio of weight & height, standardised to various age groups⁴. The 2017 Global Hunger Index (GHI) report ranked India 97th out of 118 countries with a serious hunger situation amongst South Asian nations, it third behind only Afghanistan and Pakistan with a GHI score of 29.0 which is considered as serious situation⁵. India is ranked 67 among the 80 nations having the worst hunger situation which is worse than nations such as North Korea or Sudan.

The causes and consequences of under-nutrition in India are economic inequality. Due to the low social status of some population groups their diet often lacks in both quality and quantity. Women who suffer malnutrition are less likely to have healthy babies. Deficiencies in nutrition inflict long-term damage to both individuals and society. Compared with their better-fed peers, nutrition deficient individuals are more likely to have infectious diseases such as pneumonia and tuberculosis, which lead to a higher mortality rate. In addition, nutrition deficient individuals are less productive at work. Low productivity not only gives them low pay that traps them in a vicious circle of under-nutrition⁶, but also brings inefficiency to the society, especially in India where labour is a major input factor for economic production⁷. India's performance on key malnutrition indicators is poor according to national and international studies. According to UNICEF, India was at the 10th spot among countries with the highest number of underweight and at the 17th spot for the highest number of stunted in the world⁸.

Physical Dimension – a prime means of health:

The state of physical health implies, the notion of perfect functioning of the body. Which conceptualizes physical health as a pioneer for wellbeing and from a perfect physical body & functioning itself the other dimensions like mental, social, spiritual health are achieved. Physical health of an individual depends on the nutritional state, where in good nutrition is responsible for achieving the physical dimension of health. One who is deprived will have a bad physical health and will have symptoms of ill-health frequently, frequent use of medications and restricted activity within specified time. Underweight is such a condition where in subject is destitute of physical health due to improper nutritional states. Growth and development is a physiological process provided, all factors influencing them are healthy. Failure to thrive (FTT) or Small for age is resulting when these factors are deficient and in *Ayurveda* it is addressed as *Karshya*. Where in conventional medical science have limited answers for impacts of under nutrition. *Acharya Charaka* have described over lean person under eight despicable persons (*Ashta nindita purusha*) and have explained the concept of *Brimhana* (*Bruhatwam yat shareerasya Janayet*) and *Brumhana dravyas* which produces *stoolata* of body⁹. Hence, this is an effort to study the efficacy of *Brimhana dashemani* in subjects of *Karshya* (underweight/ small to their age or height) in promoting their physical health.

METHODOLOGY

The ethical clearance for the study (approval no : 01SW/2015) was obtained from the Institutional ethical clearance committee- human on march 24, 2016 in JSS Ayurveda Medical College, Mysuru.

Study population: 30 Diagnosed cases of *Karshya* i.e subjects with BMI <18.5 & with classical *Lakshanas* of *Karshya* from OPD & IPD of JSS *Ayurveda* Medical Hospital was taken and intervened with *Brimhaniya gana dravya Khanda* for 90days. Followed upto 120 days.

Method of collection of data: A detailed proforma was prepared considering the points pertaining to consent, history taking, signs, symptoms and physical examination as mentioned in Ayurveda & contemporary science.

Design of clinical study: It was an open labelled, non-randomized, single group study with Pre and Post-test design.

Diagnostic and inclusion criteria: The subjective & objective parameters of *Karshya*, whose BMI is less than 18.5, Patients who are small to their age & height (underweight), Patients belonging to either sex between the age group 17-34 years was considered for the study.

Exclusion criteria: Patients suffering from Tuberculosis, Diabetes, Infectious diseases, Endocrine disturbances like Hyperthyroidism and BMI more than 18.5

Intervention: After taking informed consent the subjects was given *Chitrakadi Vati* (250mg) 1 TID for 3 days before food for *Deepana Pachana*. Later

subjects was advised to take 6g of granules twice daily after food with Luke warm milk (150ml) after proper stirring.

Study duration: Total 120 days including 90 days intervention and follow up for 30 days.

Assessment criteria: Laboratory investigation like Hb%, TC, DC, ESR and Anthropometric measurements like Height (cm), Weight (kg), BMI (kg/m²), mid arm circumference (cm), Abdominal circumference (cm), Waist circumference (cm). The Measurements was taken before treatment and on every visit at 0th, 30th, 60th, 90th days of study period and Follow up on 120th day.

Statistical analysis: Statistical analysis was done using SPSS trial version. Paired t-test was applied to see the difference of pre & post-test parameters. Repeated measure ANOVA test was applied to see difference in the parameters at different intervals. All the tests of significance were interpreted at 5% alpha error.

Table 1: The ingredients of *Brimhaniya gana Khanda*

BRUMHANIYA DASHEMANI DRAVYAS	PRATINIDI DRAVYAS	PART USED and PROPOTION OF DRUG USED
<i>Ksheerini Rajakshavaka</i>	<i>Dugdhika (Euphorbia hirta L.)</i>	<i>Panchanga – 4 PARTS</i>
<i>Ashwagandha</i>	<i>Withania somnifera L.</i>	<i>Moola – 1 PARTS</i>
<i>Kakoli Ksheerakakoli</i>	<i>Shatavari (Asparagus racemosus Willd)</i>	<i>Moola – 4 PARTS</i>
<i>Vatyayini Badroudani</i>	<i>Bala (Sida cordifolia)</i>	<i>Moola – 4 PARTS</i>
<i>Baradwaji</i>	<i>Vanakarpasa (Thespesia lampas Dals & Gibs)</i>	<i>Moola – 2 PARTS</i>
<i>Payasya</i>	<i>Vidarikanda (Pueraria tuberosa Dc)</i>	<i>Kanda – 2 PARTS</i>
<i>Rishyaganda</i>	<i>Vriddadaru (Argyreia speciosa Sweet)</i>	<i>Moola – 2 PARTS</i>

RESULTS

Body weight: The mean value of body weight on 0th day i.e. before treatment was observed to be 42.03 with SD of 6.483. During the study period, the mean value on 30th day was 43.30 with a SD of 6.276, the mean value on 60th day was 44.20 with SD of 6.376 and the mean value on 90th day was 45.40 with SD of 6.420. In the follow up period of 120th day the mean value of body weight was 45.93 with SD of 6.491 respectively. The mean value of

body weight increased from 42.03 to 45.40 after treatment during study period.

BMI: The mean value of BMI on 0th day i.e before treatment was observed to be 16.70 with SD of 1.291. During the study period, the mean value on 30th day was 17.30 with a SD of 1.291, the mean value on 60th day was 17.50 with SD of 1.333 and the mean value on 90th day was 17.87 with SD of 1.167. In the follow up period, on 120th day the mean value of BMI was 18.13. The mean value of

BMI increased from 16.70 before treatment to 17.87 after treatment during study period with SD of 1.106 respectively.

Mid arm circumference: The mean value of Mid-arm circumference on 0th day i.e before treatment was observed to be 21.73 with SD of 3.129. During the study period, the mean value on 30th day was 22.07 with a SD of 3.118, the mean value on 60th day was 22.60 with SD of 2.884, and the mean value on 90th day was 23.03 with SD of 2.883. During the follow up period, on 120th day the mean value of Mid-arm circumference was 23.53 with SD of 3.014 respectively. The mean value of Mid-arm circumference increased from 21.73 before treatment to 23.03 after treatment during study period.

Waist circumference: The mean value of Waist circumference on 0th day i.e. before treatment was observed to be 77.77 with SD of 7.986. During the study period, the mean value on 30th day was 78.10 with a SD of 8.002, the mean value on 60th day was 78.47 with SD of 7.943 and the mean value on 90th day was 79.00 with SD of 7.874. During the follow up period, on 120th day the mean value of waist circumference was 79.50 with SD of 7.763 respectively. The mean value of waist circumference increased from 77.77 before treatment to 79.00 after treatment during the study period.

Abdominal circumference: The mean value of abdominal circumference on 0th day i.e before treatment was observed to be 68.57 with SD of 9.058. During the study period, the mean value on 30th day was 68.83 with a SD of 8.998, the mean value on 60th day was 69.17 with SD of 8.902 and the mean value on 90th day was 69.53 with SD of 8.932. During the follow up period, on 120th day the mean value of Abdominal circumference was 70.00 with SD of 8.855 respectively. The mean value of abdominal circumference increased from 68.57 before treatment to 69.53 after treatment during the study period.

Comparison to see, difference of Weight from 0th day to different time intervals: Assphericity is not assumed as indicated by $p > 0.05$ by Mauchly's test.

Sum of the square thus arrived was 298.360 and p value was < 0.001 .

Comparison of BMI at different time intervals i.e. 30th, 60th, 90th and 120th days was done using repeated measure ANNOVA to know the significant difference among them. As seen by Post hock test there was significant increase in BMI from 0th day to 120th day which was statistically significant at p value < 0.05 .

Comparison of Mid- arm circumference at different time intervals i.e. 30th, 60th, 90th and 120th days was done using repeated measure ANNOVA to know the significant difference among them. As seen by Post hock test there was significant increase in mid-arm circumference from 0th day to 120th day which was statistically significant at p value < 0.05 .

Comparison of Waist circumference at different time intervals i.e 30th, 60th, 90th and 120th days was done using repeated measure ANNOVA to know the significant difference among them. As seen by Post hock test there was significant increase in Waist circumference from 0th day to 120th day which was statistically significant at p value < 0.05 .

Comparison of Abdominal circumference at different time intervals i.e. 30th, 60th, 90th and 120th days was done using repeated measure ANNOVA to know the significant difference among them. As seen by Post hoc test there was significant increase in abdominal circumference from 0th day to 120th day which was statistically significant at p value < 0.05 .

Haematological values: The study showed considerable increase in Hb% which was statistically significant at p value < 0.05 within normal range. Likewise there was considerable increase in WBC, Lymphocytes, Neutrophils, eosinophil's & monocytes which were all within the normal range. Study also showed participants with increased in ESR levels, with no any considerable illness was reduced at the end of study period and was within normal range.

Karshyalakshanas: Vyayama Asahata- Before treatment 21 subjects presented with the *lakshana* and not observed in 9 subjects. After treatment the

symptoms reduced in 6 subjects. **Atisauhitya Asahata-** Before treatment 6 presented with the *lakshana* and not observed in 24 subjects. After treatment the symptoms reduced in 5 subjects. **Kshut Asahata-** Before treatment 19 presented with the *lakshana* and not observed in 11 subjects. After treatment symptoms were reduced in 11 subjects. **Pipasa Asahata-** Before treatment 4 presented with the *lakshana* and not observed in 26 subjects. After treatment symptoms were reduced in 1 subject. **Aushada Asahata-** Before treatment 11 presented with the *lakshana* and not observed in 19 subjects. After treatment symptoms were reduced in 3 subjects. **Ati-sheeta Ushna Asahata:** Before treatment 6 presented with the *lakshana* and not observed in 24 subjects. After treatment symptoms were reduced in 5 subjects. **Sushka udara-** Before treatment 27 presented with the *lakshana* and not observed in 3 subjects. After treatment symptoms reduced in 17 subjects. **Sushkagreeva** - Before treatment 27 (90%) presented with the *lakshana* and not observed in 3 subjects. After treatment symptoms were reduced in 19 subjects. **Sushka sphick-** Before treatment all the subjects presented with the *lakshana*. After treatment were symptoms reduced in 12 subjects. **Damanijala Santata-** Before treatment 14 presented with the *lakshana* and not observed in 16 subjects. After treatment were symptoms reduced in 6 subjects. **Twag Asti Shosha-** Before treatment 10 presented with the *lakshana* and not observed in 20 subjects. After treatment symptoms were reduced in 6 subjects. **Stoolaparva-** Before treatment 2 presented with the *lakshana* and not observed in 28 subjects. After treatment symptoms were reduced.

DISCUSSION

According to a National survey report, list of the states of India ranked in order of people having a Body Mass Index Lower than normal (less than 18.5). Karnataka stands at 13th place with 23.5% male and 29.4% female adults with low BMI¹⁰. This is quiet alarming as the adult population which has to be most productive is affected and are vulnerable

with poor physical health. Hence this clinical trial was planned to promote weight & physical health of adult population with low BMI which is addressed in Ayurveda as *Karshya* with *Brimhana-Upakrama*.

Brimhana upakrama and Brimhana khand: Ayurveda is one of the traditional systems of medicine that practices holistic principles primarily focused on personalized health. Where in the primary principle of *Chikitsa* (treatment) focuses on *Dhatusamyakriya*, which brings the Dhatus in *Samyavastha* to support the body. *Vatadi Doshas, Rasadi Dooshya, Swedadi mala* are called as *Dhatu*. The *Prakruta-Avastha* is that where in all these Dhatus are properly formed and functioning. The pathological derangements of these leads to *Vikruthi*. The vary object of this science aims at maintaining the equilibrium of Dhatus. Though many *Upakramas* for *Karshya* has been explained in classics like *Brimhana, Snehana* and *Basti*. Prime importance is given to *Brimhana Upakarama* by all Acharyas. *Karshya* is the condition where in and *agni* leads to formation of *Alpa-Poshaka* Dhatus & resulting in depletion of *Uttorotara-Dhatus*. Where in the *Samavastha* of *Dhatus* is disturbed and the proper functioning of body is hampered. This condition can be rightly correlated to under nutrition where in physical dimension of body is deranged due to improper nutrition leading to small for age condition. The *Dravyas* which possess *Guru, Sheeta, Mrudu, Snigdha, Bahala, Sthoola, Picchhila, Manda, Sthira, and Slakshana Gunas* are said to be *Brimhana* in action. Acharya charaka further explains *dravyas* with these qualities like – *Navaanna, Shali, Masha, Godhuma, Ekshuvikara, Gramyaanupaadaka mamsa, Dadhi, dugdha, ghruta* and *rasayana dravyas*¹¹. Hence in the trial *Khandasharkara* as *Prakshepaka* and *Ksheera* as *Anupana* both with *Brimhana* action was used. The *Brimhaniya Dashemani* was explained in charaka samhita sutra sthana 4th chapter wherein drugs like *Ksheerini, Rajakshavaka, Ashwagandha, Kakoli, Ksheerakakoli, Vatyayini, Badroudani, Baradwaji, Payasya* and *Rishyaganda* are mentioned. As there

was scarcity or lack of availability and confusion in its exact identity the easily available substitutes were taken for the study which was mentioned by Acharya Chakrapani, so in the present study for the preparation of *Brimhana khanda* the drugs used are *Dugdika* (*Euphorbia hirta* L.), *Withania somnifera* L., *Shatavari* (*Asparagus racemosus* Willd), *Bala* (*Sida cordifolia* L.), *Vanakarpasa* (*Thespesia lampas* Dals & Gibs), *Vidarikanda* (*Pueraria tuberosa* Dc) and *Vriddadaru* (*Argyreia speciosa* Sweet) displayed in Fig.1.

Anupana (Fluid vehicle): *Anupana* for *Aushada dravya* have been clearly explained by Acharya Sharangadhara. With this context, *Karshya* being *Vatajaroga 3 pala* (120ml) *Anupana* was used with *Khanda kalpana*. As well *Khanda* being in *choorna* form the same dosage was fixed. According to Acharya Sushruta, in *Vata roga – Snigdha* and *Ushna* as *Anupana*¹².

Probable mode of action: The compound trial drug – *Brimhana Khanda* comprises of main as well as *pratidinhi dravyas* like *Dugdika*, *Ashwagandha*, *Shatavari*, *Bala*, *Vanakarpasa*, *Vidarikanda* and *Vriddadharu*. *Karshya* being *Atarpanajanya-vikara* should be emended by *Santarpana* measures. The Primary principle of Ayurveda *Chikitsa* is *DhatuSamyaKriya*. Where in the *Dhatu* here refers to three *Doshas*, *Sapta-Dhatu*s & *Swedadi Malas*. The *Prakruta-Avastha* of these *Dhatu*'s potentially discharging their function supporting the body is called *Swasthya* (health). Similarly when there are derangements in these *Dhatu*'s in either its formation or functions causes, *Vikruti* or *Aswasthya*. In *Karshya*, the *Prakupita vata* causes *Jataragnimandya* leading to *Upashoshana* of *Rasa-dhatu* further causing *Alpa-Poshana* of *Uttarotaradhatu*, disturbing the harmony of the physical body.

Thus it can be rightly correlated to under nutrition condition where in Physical health is deteriorated. The right *Dravya* chosen according to *Dosha karma* are the most powerful to correct the condition. Where in, Acharya Charaka mentions the *Brimhana*

guna dravyas which are bulk promoting in action, is the right management in *Karshya* to correct the Physical health. The trial drug has shown the *Brimhana* effect on the body tissues. The accelerated increase in body weight is due to the compound drugs possessing, *Madhura-Rasa* in common *Guru*, *Snigdha* and *Pichila guna* and *Madhura-vipaka*. Based on *Samanya-Vishesha Siddhanta* the opposite gunas of *vata* like *guru*, *snigdha* helps to do *Vata-shamana* and the *karmas* which can be attributed based on its therapeutic utility and *Dravyashritha gunas* like *Agnikara*, *Brimhana*, *Balakara*, *Dhatu-Ojo-Balakara*, *Varnakara*, *Kshatakshyan* (*Sida cordifolia*), *Kshatanut*, *Rasayana*, have attributed the action and also correcting the impairment in Physical dimension of health, which is reflected in underweight subjects.

The *Anurasa* present in the *Dravyas* are *Katu*, *Tikta* and *Kashaya* with *Ushna-guna* and *Katu-vipaka* might have corrected the *Jataragnimandya* and have brought *Sroto-shodhana* effect. Thus, helped in formation of potent *Poshaka-rasa dhatu* which have in turn helped in *Uttarotara-dhatuposhana*. The above properties of compound drug, has corrected the impairments in *Dhatu*s and helped in potentially discharging their functions. Thus it can be interpreted that the physical dimensions of health like a good complexion, a clear skin, bright eyes, lustrous hair, with a body well clothed, with firm flesh not too fat, a sweet breath, a good appetite, are achieved.

Adding one more wing to the trial drug compound for its *Brimhana* effect, it can be said that the nutrients present in herbs have added more value. Nutrients in *Dugdika*¹³—effective nutrients like Alpha and Beta amylin, Flavanoids, Cycloartenol, Gallic acid, Myricitrin, Tannins, Tartaric acid, Gallic acid, B Sitosterol Glucoside. Nutrients in *Ashwagandha*¹⁴ like Withanolides, Iron, Acetic acid, alanine, amino acids, glucose, glycosides, sugar, vitamin E, calcium, glutathione, lactone, paradol, starch, sucrose, vitamin A, sulphur, Zingiberene, volatile oil. Calories—10 K cal/2.7g, Total Carbohydrate—2g, Dietary fibres—1g, Calcium—1%, Iron—7%. Nutrients in

*Shatavari*¹⁵ – various minerals are abundantly present in *shatavari* roots like iron, copper, manganese, zinc and cobalt. Other minerals present in good quantity include calcium, magnesium, selenium and potassium. Vitamins such as vitamin- A, K, E, ascorbic acid, Essential fatty acid such as gamma linolenic acid, Calories– 20 Kcal/100g, Carbohydrates–3.38g, Protein–2.20g, Total fat–0.12g, Dietary fibres–2.1g¹⁶. Nutrients in *Bala*¹⁷–Alkaloids, carbohydrates, glycosides, fixed oils, fats, glycosides, steroids, flavanoids, saponins, proteins, amino acids, beta sitosterol, Ephedrine, Gallic acid, Phytosterols, Asparagine, Betaine, sterols, Choline, Mucilage, Tannins, Vasicine. Nutrients in *Vanakarpasa*¹⁸ – Flavanoids, Quercetin, Tannins, Triterpenoids. Nutrients in *Vidarikanda*¹⁹–*B Sitosterol, Gluconic, Malic acid, Stigmasterol, Hydroxytuberosone, Pterocarpans, Tuberosin*. Nutrients in *Vriddadaru*²⁰– Argemoneochroleuca, arginine, arginine pidolate, arginine pyroglutamate. The nutrients present in the

compound drug have effectively corrected the both macro and micro nutrients thus by acting as nutritional supplementation in the present study.

CONCLUSION

The present clinical study was planned to study the effectiveness of *Brimhaniya gana dravya Khanda* in promoting body weight & physical health among lean subjects. The *Brimhana khanda* has provided statistically significant results on the parameters of *Karshya* i.e. underweight by increasing weight and also in positive promotion of overall physical health in all the subjects selected for the study. No adverse effects were reported during the entire study period. The present clinical study was carried out on a limited number of patients. Hence, an extended study with more clinical parameters and on a large number of patients can be considered to precisely find the effect of treatment.

Fig. 1: Ingredients of the trial drug- *Brimhana Khanda*



Ashwagandha- *Withania somnifera*



Dry sample of Ashwagandha - *W. somnifera*



Shatavari – *Asparagus racemosus*



Dugdhika – *Euphorbia hirta*



Dry sample of Bala – *Sida cordifolia*



Dry sample of Shatavari – *A. racemosus*

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