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STUDY THE EFFICACY OF CHATURJATADI CHURNA IN THE MANAGEMENT OF BALKRUSHA W.S.R. TO UNDERWEIGHT CHILDREN

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ABSTRACT

Underweight children are a hard-social indicator. In addition to the care of the individual patient, the only way in which we can hope to eradicate *Malnutrition* permanently from a community is by an all-round improvement in living conditions, rising of the socio-economic status, increasing food production, improving sanitation, and raising the standard of education and population control. In the developing country like India had face much problems like nutritional Deficiency disorders along with physical and mental growth and development of the children. Disorders occurs due to Malnutrition like Kwashiorkor, Marasmus, Marasmic Kwashiorkor, Invisible PEM, Nutritional dwarfism.so that Clinical composition of the *Chaturjatadi churna* is also supporting its role as anabolic agents, hence we had evaluate the effect of *Chaturjatadi churna* on *Balkrusha* w.s.r. to underweight children with the help of randomized controlled clinical study was carried out.

Keywords: Underweight Children, *brunhana churna*, malnutrition. disorders, nutrition

INTRODUCTION

Ayurveda literally means knowledge of life.The importance of childhood was well recognized in Ayurveda, as one among the eight branches of Ayurveda was dedicated to the *BALA* i.e. children. *Acharya Kashyap* placed *Kaumarbhritya* above all the other eight branches in *Kashyap Samhita*.[1]

Many diseases are known to afflict human being, which includes infectious, metabolic, genetic and nutritional disorders. Out of these, nutritional diseases are most common problem throughout the world. Approximately 47% of India's under five population is afflicted by underweight. The *Undreweight Children* fails to maintain their weight or growth rate and muscle mass leading to dysfunction of many vital organs. Similarly, the mortality of the children with malnutrition are maximum to which needs much attention to that area to control from the dietic as well as therapeutic point of view. Despite giving proper nutrition, due to improper digestion and assimilation most of the children cannot gain their weight successfully owing to improper metabolic transformation. The Global Index Report ranked India 15th amongst leading countries with hunger situation. The cases of Underweight Children are more found in developing countries like India leading to complications such as increasing morbidity and mortality rate of children.[2]

Ayurveda believes in nutrition with proper digestion. As in Ayurvedic classics we found references that *mandagni* is the root cause of all diseases. All the Acharyas has given emphasis for *Agni* while treating malnourished children. Only *Bruhan drugs* are not helpful for gaining satisfactory weight.[3]

Chaturjatadi Churna has been mentioned in *Gada Nigrah* for its effectiveness on *Krusha* children. It is having *dipaniya, pachniya, rasayan, bruhaniya* properties which will be helpful for correction of *jathaar-agni* as well as *dhatwagni* increasing *dhatuposhan* which leads to increase in body weight. It will also fight against infective conditions responsible for deterioration of children due to their *rasayan* properties. [4,5] No study has been conducted on above drugs hence, we will evaluate the efficacy of *Chaturjatadi churna* on *Balkrusha* w.s.r. to *Underweight Children.*

Though much of the literature dealing with *Kaumar-bhritya* is mutilated even the available matter gives a glimpse of the property of this branch in the golden era. The recent demographic studies report that 1/3 of the world's population is of children below 15 years of age. These statistics increase the responsibility of pediatric community from Ayurveda as well as modern contemporary science towards the society.[6]

Data from the United States and other developed countries indicate that the prevalence of under nutrition is manifested by a low weight for age or height for age is very low. This was further confirmed by the National Health and Nutrition Examination Survey (*NHANES*) data. The data also showed that populations with a high prevalence of poverty do not have a higher prevalence of under nutrition than the general population emphasizing the importance not only of adequate intake but also of adequate care as defined in the United Nations International Children's Emergency Fund

(UNICEF) framework. (Nelson)

The World Health Organization estimates that by the year 2015, the prevalence of malnutrition will have decreased to 17.6% globally, with 113.4 million children younger than 5 years affected as measured by low weight for age. The overwhelming majority of these children, 112.8 million, will live in developing countries with 70% of these children in Asia, particularly the south-central region, and 26% in Africa. An additional 165 million (29.0%) children will have stunted *length/height* secondary to poor nutrition. Currently, more than half of young children in South Asia have PEM, which is 6.5 times the prevalence in the western hemisphere. In sub-Saharan Africa, 30% of children have PEM.[7]

Aim: To study the efficacy of *Chaturjatadi churna* on *Balkrusha*.

Material and Methods: - The children age group of 3-7 years, including those attending the O.P.D. of College and from various medical camps taken in campus of college with problem of poor weight gain, poor growth, lean and thin body complaints of *Daurbalya*. After taking a complete history emphasizing on milestones and dietetic history, the study was carried out after appropriate counseling with parents of children and written consent from parents. Diagnosis of *Underweight children* will base on IAP criteria.

Material: - Criteria for selection of patients

Inclusion Criteria:

1. Age group between 3 yr. to 7yr.
2. Patient of either sex irrespective of cast, socio–economic status
3. Children weighing below average body weight for their chronological age.
4. Children with normal diet intake.
5. Children with Grade I Malnutrition as per IAP classification.

Body weight: it was considered according to the following table (In Kgs) given by IAP textbook of pediatrics.

Table 1: IAP criteria for normal weight in child acc to Age.

Age in years	Grade I
3yrs	11.2-12.5
4yrs	12.6-14.2
5yrs	14.2-16
6yrs	15.5-17.5
7yrs	17.4-19.6

Any child weighing Grade I according To IAP criteria normal weight shown against the age as per the table above is included for study.

After recording the vital data like age, sex, religion, economic status etc. each child was examined in general and for clinical nutritional status. Various physical anthropometric measurements were taken i.e. *weight, Mid-arm circumference, height, chest circumference* etc. for assessing the growth status of the children. In each child the weight has been recorded initially and in each follow up. *Weight* was taken in kilograms with platform type balance, capable of detecting a half-kilogram change in body *weight. Mid-arm circumference* was measured by passing a tape around the mid-point of Rt arm. This was measured in centimeters.[8]

Exclusion Criteria:

- Children below the age of 3 years and above 7 years were excluded.
- Children suffering from infectious and chronic systemic illness.
- Children of chromosomal, genetic, metabolic, or congenital Disorders Children suffering from chronic diarrhea, primary complex or increased B.M.R. (Basal Metabolic Rate) or suffering from congenital heart disease etc., were not included in the study.
- The children of Grade II, Grade III and IV malnutrition were excluded.

METHOD

Method of collection of data:

The method of study was by interrogation, examination and collection of details from each child and teacher (if necessary) and parents. The nature, purpose, objective of the study was explained to both students' parents and teacher, before starting the work.

The required data was collected, by using the proforma designed for the purpose of study. After recording the vital data like age, sex, religion, economic status etc. each child was examined in general and for clinical nutritional status. The ages of the children were obtained from birth record maintained in the school as told by parents.

The total children having *underweight* were randomly divided in two groups. Same diet, daily regime was advised to both groups.

Grouping of Patients

Group A (Study group**)-**

30 patients of this group were administered *Chaturjatadi churna.*

Group B (Control Group**)-**

30 patients of this group were administered with *Wheat powder* for the same period.

Drugs selected for the study

The following drug were selected for the present study:

Table 2: comparative dose between *Chaturjatadi Churna* and wheat powder.

Group	No. Of Pt.	Drugs	Mode of administration	Age group yrs Dose (Dilling's Formula: Ageyrs/20xA.D) (Adult Dose – 1 KARSH = 12 gm)	Duration	Advice
Group (A)	30	CHATURJATADI CHURNA	*Oral*	3 to 4 - 4.2 gm/day 4 to 5 - 4.8 gm/day 5 to 6 - 5.4 gm/day 6 to 7 - 6.0 gm/day	60 days	Advice for proper hygienic condition & normal Diet, daily regimen.
Group (B)	30	WHEAT POWDER	*Oral*	3 to 4 - 4.2 gm/day 4 to 5 - 4.8 gm/day 5 to 6 - 5.4 gm/day 6 to 7 - 6.0 gm/day	60 days	

Study Design: *A randomized controlled* clinical study was carried out.

Statistical Analysis: Data was collected, tabulated, analyzed and percentage wise results were given.

Total effect of therapy: Total effect of therapy was assessed according to following criteria.

Table 3: Average improvement in signs & symptoms of *Balakrusha* (underweight children.)

1	Marked	75 to 100% relief from signs and
	Improvement	Symptoms
2	Moderate	50 to <75% relief from signs and
3	Mild Improvement	25 to <50% relief from signs and
		Symptoms
4	No Improvement	<25% relief from signs and symptoms

The clinical observations of 60 patients are presented in this study & the effect of therapy is evaluated in the same number of patients, who completed the treatment. Results were evaluated after completion of clinical study.

Result

1.Overall Result of standard subjective criteria: -

The total over all therapy showed that in Group A total improvement is about 75% and no improvement is 25 %. In Group A 25 % patient showed marked improvement, 12.5 % patients showed, 25 % showed no improvement, while 37.5 % patients showed moderate improvement i.e. maximum.

In Group B maximum i.e. 75 % patients showed no improvement, 25 % patients showed mild improvement, whereas no patients showed moderate and marked improvement. i.e. total improvement is only 25 % and no improvement is 75 %

There is progressive change in *Daurbalya, Kshudha, Nidra,* Appearance and Constipation in Group A. The child who was looking old due to loss of subcutaneous fat on cheeks, face changed to child look. *Dhamanijala Darshana* showed mild improvement in group A. Here more *Brimhana* in required. In Group A *Chaturjatadi churna* showed marked and moderate relief was found appearance and buccal pad of fat. It may due to in *Chaturjatadi churna* group have property of *Balya* and *Brimhana* and contain nutrients. Appetite, bowel habit, sleep and *Daurbalya* are interrelated. In Group A, appetite, bowel habit, sleep and *daurbalya* are revealed with moderate to marked improvement while in Group B mild relief was found in *Kshuda* and *Nidra.* That may be due to proper counseling with parents and regularity in daily diet and regimen. In this disease, main defect is in previous *Srotas* and *Agni* before *Mamsa Dhatu* proper, *Chaturjatadi churna* after giving, pacify the *Vata* and maintain *Agni* in its proper function and clear the channels and helps in proper nourishment of *Dhatus* by its *Balya a*nd *Brimhana* property.[9,10]

2. overall result according to standard objective criteria: -

Though the positive results were observed in Group A as compare to Group B. As *Chaturjatadi churna* is most effective against *Vata*, which is predominant factor in *Krusha roga*. Thus, person treated with *Chaturjatadi churna*, became *Dhatu Samya* the nourishment of body also increases due to the subsequent increase in *Agnibala*.[11,12] Hence, *Chaturjatadi churna* showed better effect.

DISCUSSION

The observations made during the clinical study on various factors are shown in tables and diagrams. In this study, 65 patients were registered irrespective of their *age, sex, religion,* etc. They were randomly divided into two groups.

1. *Chaturjatadi churna* Group (Group A)
2. Placebo (Wheat powder) Group (Group B)

Our classics have emphasized the importance of practical application of theoretical knowledge at various

instances. Clinical research enables us to evaluate the quoting of our classics critically, objectively and scientifically so that their validity is established. It is a powerful tool which when used properly will help our science to get a strong hold in today's era of Evidence Based Medicine. A famous proverb states: "Any science without statistical data is like a tree without fruits & similarly only statistic without science is like a tree without root". Thus, any principle related to a medical science necessarily should be authenticated by a Clinical data. Promotion of the health of a healthy person and the treatment of disease if occurred are the two prime aims of Ayurveda. The prevention of disease gets almost importance in childhood period and so nowadays separate branch of preventive pediatrics has been taken shape in which mainly the health of a child is taken care of.

This mainly deals with the nourishment of the children & observations of children growth & development at different age periods. In modern science, the protein anabolic steroids which are derivatives of testosterone are promoter of tissue building & restores weight loss. Testosterone itself is a masculine hormone. They are expected to exert minimal gonadal and maximal anabolic effects. Intensive efforts have been directed over the past few years towards the synthesis of compound which promote nitrogen retention, but which are devoid of masculinizing but none has been brought forward that is completely free of androgenic effects & hence their usefulness in a widening area of clinical application becomes a problem. However, it would be highly desirable to have such (anabolic) therapy that is not having androgenic effect for permitting its use in women without including masculinizing and in children without causing undesirable effects on sexual & osseous development.

Ayurvedic drugs and procedure are believed to have safer non hormonal anabolic activity. *Chaturjatadi churna* is one which offers strength, anabolic effect at an early. Considering all the above points, it has been thought to develop on effective Ayurvedic medicinal remedy, which have been claimed to possess a definite anabolic effect on the disease *Krusha*. So, the present study was chosen to evaluate the effect *Chaturjatadi churna* in the management of *Krusha* in children. Thus, the present work may help in the field of preventive pediatrics.[13,14] The clinical trials have designed with following headings.

Statistical analysis of given sample with help of standard subjective and objective criteria.

1. Objective criteria Comparison between Group A and Group B

Table 4: Comparative Result of objective criteria.

	Group	N	Mean Diff	SD	SE	t-Value	P-Value
Weight	Group A	30	0.64	0.21	0.04	13.297	0.000
	Group B	30	0.09	0.08	0.01		
Height	Group A	30	1.03	0.67	0.12	6.955	0.000
	Group B	30	0.10	0.31	0.06		
Chest Circumference	Group A	30	0.50	0.57	0.10	3.003	0.004
	Group B	30	0.13	0.35	0.06		
Mid Arm Circumference	Group A	30	0.07	0.05	0.01	4.200	0.000
	Group B	30	-0.02	0.09	0.02		
BMI	Group A	30	0.28	0.26	0.05	4.297	0.000
	Group B	30	0.07	0.08	0.01		

For comparison between Group A and Group B, we have used unpaired t-test. From above table we can observe that P-values for all parameters are less than 0.05, hence we conclude that there is significant difference between Group A and Group B.

2. Standard subjective criteria comparison between Group A and Group B: -

Table 5: Comparative Result of Subjective Criteria.

	Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U	P-Value
Daurbalya	Group A	30	41.25	S	127.500	0.000
	Group B	30	19.75	592.50		
	Total	60				
Kshudha	Group A	30	42.55	1276.50	88.500	0.000
	Group B	30	18.45	553.50		
	Total	60				
Dhamani Jala Darshan	Group A	30	35.60	1068.00	297.000	0.003
	Group B	30	25.40	762.00		
	Total	60				
Sthula Parva	Group A	30	35.50	1065.00	300.000	0.002
	Group B	30	25.50	765.00		
	Total	60				
Nidra	Group A	30	41.93	1258.00	107.000	0.000
	Group B	30	19.07	572.00		
	Total	60				
Appearance	Group A	30	42.30	1269.00	96.000	0.000
	Group B	30	18.70	561.00		
	Total	60				
Constipation	Group A	30	41.50	1245.00	120.000	0.000
	Group B	30	19.50	585.00		
	Total	60				
Kapol Gata Vasa	Group A	30	35.00	1050.00	315.000	0.008
	Group B	30	26.00	780.00		
	Total	60				

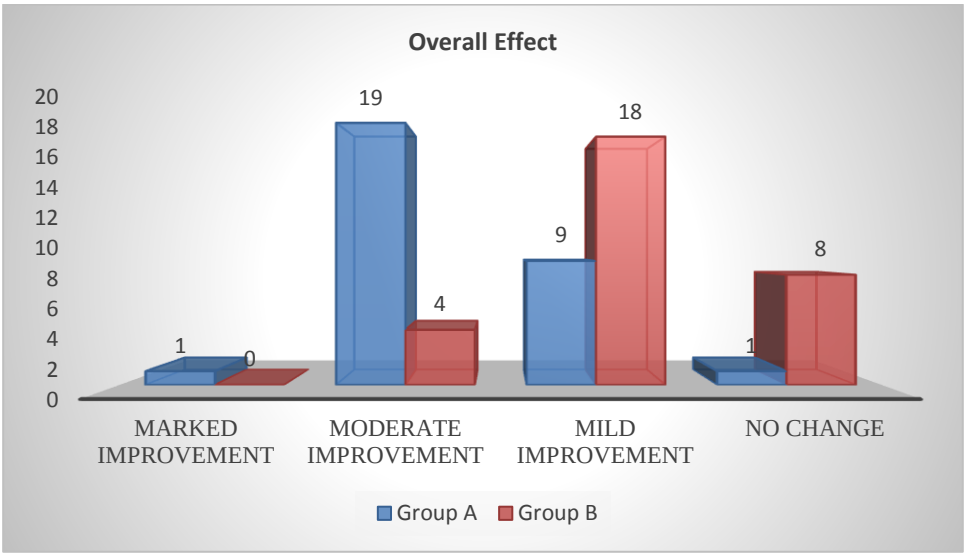
For comparison between Group A and Group B, we have used Mann Whitney U test. From above table we can observe that P-Values for all parameters are less than 0.05. Hence, we conclude that there is significant difference in Group A and Group B.

Further we can observe that mean rank for Group A is greater than Group B. Hence, we conclude that effect observe din Group A is more than Group B.

Table 6: Overall Effect of *Chaturjatadi Churna* in Both Groups.

Overall Effect	Group A		Group B	
	Frequency	Percentage	Frequency	Percentage
Marked Improvement	1	3.3	0	0.0
Moderate Improvement	19	63.3	4	13.3
Mild Improvement	9	30.0	18	60.0
No Change	1	3.3	8	26.7
TOTAL	30	100.0	30	100.0

Figure 1: Overall Effect of Chaturjatadi Churna in Both Groups.



CONCLUSION

Bad food habits, lack of nourishment and environmental pollution are caused the disturbance in physiological and psychological aspect of children leading to *Krusha*. It can be concluded in this study that *Doshbala Pravruta* factor is mainly responsible for disease. Most of the patients were delivered normally and their growth and development were also appropriate for age. The disease was developed in later childhood and later stage of life due to etiological factors discussed earlier. In the present study the anabolic effect of certain Ayurvedic drugs i.e., *Chaturjatadi churna* was studied in the underweight children and the results are presented in this work. In this study the results were found very encouraging and promising. *Chaturjatadi churna* is *Rasayana, Balya, Bruhana* property which is not only able to increase the body weight of the children but also fight the infective condition responsible for deterioration of the children. Clinical composition of the *Chaturjatadi churna* is also supporting its role as anabolic agents, hence we will evaluate the effect of *Chaturjatadi* on *Balkrusha* w.s.r. to underweight children. Includes end results of all the study which tends to fulfill all Aims & Objectives in various views and angles which states the total output of the study. Based on this study it was concluded that there might be acceleration of protein synthesis and the fat deposition in the treated group children and hence the body growth is accelerated which resulted in the improvement of weight and various anthropometrical measurements. These observations are in conformity with the *Balya* and *Brumhana* process described in the Ayurvedic Samhitas.

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