# A RANDOMIZED OPEN CLINICAL TRAIL ON THE EFFECT OF YAVADI CHURNA WITH DAVANAGERE MIX AND DAVANAGERE MIX IN TREATMENT OF KARSHYA (UNDERWEIGHT CHILDREN)

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**ABSTRACT**

Protein energy malnourishment is widely recognized as a major health problem which is responsible for high rates of mortality and morbidity in developing countries including India. In a majority of children, mild to moderate malnutrition (grade 1 and grade 2) remains undetected due to lack of awareness on the part of all concerned. The condition needs a special attention in initial stages to avoid grave ailments of grade 3 and grade 4 malnutition. Hence the present study "A randomized open clinical trail on the effect of yavadichurna with davanagere mix and davanagere mix in treatment of karshya (under weight children)" **Methods:** Detailed case proforma was prepared and observations were recorded and graded. 60 children suffering from grade 2 malnutrition were selected from OPD, IPD and swarnaprashana camps conducted in S.J.G.A.M.C and hospital in the Department of Kaumarabhritya. (Group A) received Yavadichurna with Davanagere mixture and Control group (group B) received Davanagere Mixture alone for a period of 1 month. Detailed case proforma was prepared and observations were recorded and graded. **Results:** Results obtained after the clinical trial was analyzed statistically and all the observations were subjected to creative discussions. The final results showed that after 1 month of administration of the treatment, trial group showed significant result in comparison to the control group in the parameters like appetite, weakness, weight, height, mid arm circumference. The effect of treatment was stable in trial group. **Interpretation and Conclusion:** The present study showed that Yavadichurna is more effective in correcting grade 2 malnutrition than the alone health mix. The present study has revealed the scope for conducting more researches in the topic of protein energy malnourishment and also in the drug Yavadichurna.

**KEYWORDS:** Protein energy malnourishment, Yavadichurna, karshya, Davanagere mixture.

## INTRODUCTION

Protein energy malnutrition is one of the most widespread nutritional problems of developing countries. Annually under nutrition kills or disables millions of children. It often causes disease and disability in the survivors and prevents millions more from reaching their full intellectual, educational and productive potential.

PEM is the term applied to a class of pathological condition arising from coincidental lack in varying proportions of proteins and calories. The research shows that nearly half of India's children approximately 60 million are underweight. At present the average level of malnutrition in the India is 42% to 48%. In Karnataka, incidence is about 42.5% of children under the age of 5 year.[2]

In Ayurveda karshya can be clinically compared with condition of malnutrition, which is considered as one among the kuposhnajanyavyadhi. Karshya is a clinical entity presented with features like shushkaspika, udaraandgreeva, dhamanijalasantata, twagastishesha with sthoola parva. And charaka advises laghusantarpana and brumhanachikitsain karshya.[3]

The children with karshya need madhura, snigdha, ushna, andlaghuguna property drugs and diet in their treatment. Yavadichurna explained in Bharata bhaishajyaRatnakar having ingredients which are Deepana, Amapachaka, Balya and Brumhana in nature and most of the drugs are having anabolic property may be helpful in treating karshya. Nutritional diet is very necessary in treating malnutrition but it is alone may not

be sufficient to give amapachaka and deepana effect in karshya.[4] In such conditions Yavadichurna may increase the absorption and give additive results along with nutritional diet.

So here an attempt is made to evaluate the efficacy of Yavadichurna with Nutritional diet (Davanagere Protein Energy Rich) mixture} and Davanagere mixture in improving nutritional status and to assess the adjuvant action of Yavadichurna in Underweight children.

## MATERIALS AND METHODS

### Objectives of the Study
To evaluate the effect of Yavadichurna with nutrition diet and nutrition diet without Yavadichurna in improving the weight of underweight children.

### Source of Data
**(a) Sample Source**
Patients were selected from OPD, IPD and Swarnaprashana camps conducted in Department of Kaumarabhritya, S.J.G.A.M.Cand Hospital, Koppal

**(b) Literary Source**
All the classical, modern literatures and contemporary texts including the journals and websites regarding the

disease and drugs were reviewed and documented for the intended study.

### Composition of the yavadichurna[5]

| SL. NO | Drug | Botanical name |
|--------|------|----------------|
| 1 | Yava | Hordeum vulgare |
| 2 | Nagabala | Sidaveronicaefolia |
| 3 | Ashwaganda | Withaniasomnifera |
| 4 | Guda | |
| 5 | Masha | Phaseolus mungo |
| 6 | Tila | Sesamum indicum |

### Preparation of the medicine
The selected drugs were obtained from department of Dravya Guna and prepared with pre requisite standard procedure in the Department of Rasashastra Bhaisajya Kalpana of S. J. G. Ayurvedic Medical College and Hospital, Koppal.

### Method of preparation of drug
All the ingredients were taken in equal quantity and triturated in a clean khalva yantra to obtain a homogenous mixture. The dry powder obtained is stored in airtight wide mouthed containers for further therapeutic use. The product was a greenish white colored powder.

## Composition of the Davanagere mix[6]

| Ingredients | Calories\100g | Proteins\100g |
|-------------|---------------|---------------|
| Ragi flour (40g) Bengal gram (16g) Groundnut(10g) Jaggery (20g) | 330 \ 86 | 11.6 \ 86 |

Above composition was calculated based on age and weight of the Children and given.

### Method of collection of data
Patients who were fulfilled the diagnostic inclusion criteria were selected for the study.
**(a) Study design:** A Randomized open control clinical study.
**(b) Sample Size Grouping**

60 patients (completed) diagnosed of Underweight children were selected and randomly divided into the following two groups, each comprising of 30 patients.
For Group A Yavadichurna with Davanagere mix received and Group B received Davanagere mix alone.

### Diagnostic Criteria
The symptoms of karshya children mentioned in classical texts, in addition to the signs and symptoms mentioned in the underweight children in contemporary texts have been considered for diagnosis.

Triceps skin fold test, Mid arm circumference Grade 1and2 malnourished children classified according to IAP(Indian Association of Paediatric).

CBC was advised to exclude severe anemia and any sign of infections.

### Inclusion criteria
- Age group between 2-6 years of Underweight children with Mild to Moderate Anemia and Grade 1 and 2 malnourished children.

### ❖ Exclusion criteria
- ❖ Patients with k/c/o Kwashiorkor, Marasmus, Rickets, Cerebral palsy and any other syndromes.
- ❖ Systemic diseases with k/c/o TB, DM, STD[s], HIV, and HBsAg.

**Treatment protocol**

|  | Group A: | Group B: |
|---|---|---|
| Patients | 30 | 30 |
| Drugs | Yavadichurna with Davanagere mix | Davanagere mix |
| Dose | 2-10 gms/kg in 2divided doses | Protein requirement of child |
| Time of administration | ½ an hour before to nutritional diet, BD | Before food, BD |
| Anupana | Milk | Milk |

| Treatment Duration | Follow up duration | Total study duration |
|---|---|---|
| 1 Month | 1 Month | 2 Month |

**Outcome assessment**
**Subjective parameters**
**1. Daurbalya (Debility)-** The activities of child have been taken into consideration for assessment Of Daurbalya
No weakness -0
Weakness on excessive play -1
Weakness on normal play -2
Weakness even on rest-3

**2. Kshudha (Appetite)**
Child does not take food considerably even by force – 3
Child does not ask but takes food considerably by request – 2
Child himself asks food but not take adequately - 1
Child himself asks food and takes adequately – 0

**3. Malapravrutti (bowel movement)**
Normal stool once daily -0
Normal stool 2 – 3 times a day -1
Loose stool 3 – 4 times a day -2
Loose stool more than 4 times a day-3

**4. Pandutha (pallor)**-WHO grading of anemia
No pallor -0
Mild paleness in conjunctiva -1
Paleness in conjunctiva, tongue and nails -2
Marked paleness in face and palmer crease-3

**5. Dehakshaya (Emaciation)**
No emaciation -0
Muscle wasting in arms and legs -1
Muscle wasting in arms, legs and buttocks -2
Muscle wasting in arms, legs, buttocks and face-3

**Objective parameters**
1. Mid arm circumstance
2. Skin fold thickness
3. Weigth
4. Hight

**Classification Based on Skin fold Thickness[7]**
Mild: 80-90 % of expected for age (8-9 mm)
Moderate: 60-80 % of expected for age (6-8 mm)
Severe: Under 60 % of expected for age (> 6 mm)

**Mid arm circumference[8]**
For all practical purposes, the maximum circumference of the upper arm

**Assessment of results**
Subjective and objective parameters were assessed on day 1(before treatment) ,day 30 (after treatment ) and on day 60(after follow up) and statistically tested by using Wilcoxon signed ranks test, Mann Whitney U Test, student paired and unpaired test according to the data.

**OBSERVATIONS**

| Sl No | PRADHANA VEDANA | GROUP 'A' | | GROUP 'B' | | TOTAL | |
|---|---|---|---|---|---|---|---|
|  |  | No.of pts | % | No.of pts | % | No.of pts | % |
| 1 | Kshudha | 21 | 70 | 23 | 76.66 | 44 | 73.33 |
| 2 | Dourbalya | 19 | 63.33 | 16 | 53.33 | 35 | 58.33 |
| 3 | Dehakshaya | 23 | 76.66 | 21 | 70 | 44 | 73.33 |
| 4 | Panduta | 04 | 13.33 | 06 | 20 | 10 | 16.66 |
| 5 | Malapravrutti | 08 | 26.66 | 06 | 20 | 14 | 23.33 |

| Sl. No | WEIGHT | GROUP 'A' | | GROUP 'B' | | TOTAL | |
|---|---|---|---|---|---|---|---|
|  |  | No.of pts | % | No.of pts | % | No of pts | % |
| 1 | Mild malnutrition | 17 | 56.66 | 14 | 46.66 | 31 | 51.66 |
| 2 | Moderate malnutrition | 13 | 43.33 | 16 | 53.33 | 29 | 48.33 |

## RESULTS

| Subjective Parameters | | Mean | | | SD | | | Reduction in % | | P value | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BT | AT | AF | BT | AT | AF | BT with AT | BTwith AF | | |
| Kshudha | GA | 1.77 | 0.87 | 0.53 | 0.971 | 0.776 | 0.571 | 51% | 70% | <0.001 | HS |
| | GB | 1.67 | 0.93 | 0.67 | 0.758 | 0.740 | 0.661 | 44% | 60% | <0.001 | HS |
| Pandutha | GA | 0.50 | 0.23 | 0.13 | 0.50 | 0.43 | 0.34 | 53% | 73% | <0.001 | S |
| | GB | 0.50 | 0.30 | 0.23 | 0.57 | 0.46 | 0.43 | 40% | 53% | <0.05 | MS |
| Dourbalya | GA | 1.27 | 0.43 | 0.17 | 0.583 | 0.568 | 0.379 | 66% | 87% | <0.001 | HS |
| | GB | 1.23 | 0.60 | 0.37 | 0.774 | 0.563 | 0.490 | 51% | 70% | <0.001 | HS |
| Dehakshaya | GA | 1.60 | 0.77 | 0.47 | 0.621 | 0.626 | 0.629 | 52% | 71% | <0.001 | HS |
| | GB | 1.57 | 0.93 | 0.67 | 0.971 | 0.828 | 0.758 | 40% | 57% | <0.001 | HS |
| Malapravrutti | GA | 0.73 | 0.17 | 0.07 | 0.583 | 0.379 | 0.254 | 77% | 91% | <0.001 | HS |
| | GB | 0.70 | 0.27 | 0.20 | 0.837 | 0.521 | 0.484 | 62% | 71% | <0.001 | HS |

| Objective parameters | | Mean | | | SD | | | Reduction in % | | P value | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BT | AT | AF | BT | AT | AF | BT with AT | BT with AF | | |
| MAC | GA | 1.83 | 1.43 | 1.07 | 1.020 | 0.935 | 0.785 | 22% | 42% | <0.001 | HS |
| | GB | 1.93 | 1.63 | 1.30 | 0.828 | 0.890 | 0.887 | 16% | 33% | <0.01 | S |
| TSFT | GA | 1.20 | 0.93 | 0.73 | 0.847 | 0.640 | 0.521 | 22% | 39% | <0.01 | S |
| | GB | 1.20 | 1.03 | 0.87 | 0.484 | 0.490 | 0.507 | 14% | 28% | <0.5 | MS |
| WEIGHT | GA | 10.41 | 11.25 | 11.67 | 2.97 | 2.92 | 2.91 | 7.5%(inc) | 10.8%(inc) | <0.001 | HS |
| | GB | 12.25 | 12.69 | 13.09 | 2.09 | 2.08 | 2.03 | 3.5%(inc) | 6.5%(inc ) | <0.001 | HS |
| HIGHT | GA | 88.43 | 89.87 | 91.03 | 11.18 | 11.31 | 11.37 | 1.60%(inc) | 2.86%(inc) | <0.001 | HS |
| | GB | 95.07 | 96.07 | 96.93 | 6.03 | 6.04 | 6.01 | 1.04%(inc) | 1.92%(inc) | <0.001 | HS |

## DISCUSSION

PEM is one of the most common nutritional problems. In Ayurveda karshya can be clinically compared with condition of malnutrition, karshya need madhura, snigdha, ushna, and laghu guna property drugs and diet in their treatment. So according to treatment modality of ayurveda, treatment plan was done, Most of ingredients of  trail drug (Yavadi churna) which are Deepana, Ama pachaka, Balya and Brumhana, rasayana in nature and the drugs are having Anabolic property may helpful in treating karshya.

After thorough understanding of pathophysiology of PEM its evident that body tissues are in starvation and catabolic stress. In karshya agnimandya is one of major symptom present this agnimandhya here refers jataragnimandhya and dhatvagnimandhya which results in poor digestion, poor absorption / mal-absorption and poor assimilation. we need drug/treatment  which increases agni (jataragni and datvaagni) meanwhile not aggrevating the catabolic stress of disease yava and aswagandha are best agnideepaka. when patient starts balanced diet and supplemental nutrition  yava and aswagandha increases appetite, helps in the absorption and assimilation of nutrients.

Tila,[9] is rich source of calcium, zinc and iron,Calcium and zinc are good for bones, zinc is very necessary to stop the diarrhea,its also antioxidant and also good source of vitamin E.

Guda,[10] is includes calcium, phosphorus,magnesium, potassium and iron and traces of zinc and copper.Are good source of energy and increases hemoglobin level and prevents anaemia. The Barley is highly nutritional value by its properties. It can be good substitute of carbohydrate, protein, fibres and minerals in diet.

Masha/Black gram is appetizer, laxative properties. It is good neuron tonic and used in constipation, neurological disorders and debility etc.

Nagabala and Aswagandha Both the drugs are proven immunomodulators.[11] These are immuno stimulatory drugs which primarily implies stimulation of non specific immunity.

Here Yava,Masha,Tila,Guda drugs having properties like Balya,Bruhmana,Dhatuvardaka,agnivardaka helps to improve agni thereby improving weight .Nagabala, Ashwaganda of Yavadichurna which are having properties like Balya,Rasayana Dhatuvardaka which help to increase the strength and helps in swasthyaparipalana. Here Yava, Masha having the properties like Bahuvatamala,[12] which help for proper bowel movement.

Overall results are satisfactory, because Yavadichurna may be the best adjuvant which may improves digestion, absorption, and assimilation when we advice with Davanagere mix.

## CONCLUSION

The study revealed that the trial drug- Yavadichurna with Davanagere mixture and the control drug- only Davanagere mixture was found to be effective in

reducing grade 1 and 2 PEM. It improved the nutritional status that was reflected by anthropometric measurements. Trial group showed significant result in comparison to the control group in parameters like appetite, weakness, weight, except for mid arm circumference, tricep skin fold test, height, The effect of the treatment was found stable in trial group.The Alternate hypothesis of the study was proved.

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