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# COMPOSITE DIETARY MANAGEMENT WITH AGNI CHIKITSA IN MALNOURISHED CHILD-CASE STUDY

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## ABSTRACT

Malnutrition is prevalent in India and account for approximately 35% deaths in children under five years of age. Such children very often suffer from complications of malnutrition such as diarrhea, acute respiratory infections, malaria and skin infections if not managed well. Skin changes occur especially in kwashiorkor which consists of hypo or hyper pigmentation, desquamation, ulcerations and exudative lesions. In this case study an 8 year old child presented with complications of severe to acute malnutrition (SAM) as severe ulcerations of feet with generalized edema & itching. The SAM management protocol consists of initial management of acute consequences and later part includes dietary management with starter diet (F-75) & catch up diet (F-100). But usually fewer efforts are taken to build proper appetite to help body systems to digest heavy carbohydrates and protein containing feeds. Such undigested material is called as *Aama* leading to *Ajeerna*. The case was managed with a composite dietary plan based on *Agni chikitsa* to digest *Aama* along with regular wound care. It showed significant reduction in edema, increase in appetite, better tolerance of protein rich food and partial healing of skin lesions over a period of 15 days.

**KEYWORDS-** Severe Acute Malnutrition (SAM), complications of Severe Acute Malnutrition, *Agni chikitsa*.

## INTRODUCTION

Childhood malnutrition is an underlying cause in an estimated 35% of all deaths among children under five years of age.[1] According to a recent report, in April 2017 by the Integrated Child Development Scheme (ICDS), 10% children of the Maharashtra state out of the total 60.69 lakh were found to be moderate or severely underweight as per nutritional standards.[2] Malnutrition is highly prevalent in Osmanabad district of Maharashtra as well. Underdeveloped area, poverty, and low socioeconomic conditions make it prevalent.

Under nutrition is a condition in which there is inadequate consumption, poor absorption, or excessive loss of nutrients which includes Protein Energy Malnutrition (PEM).[3] Previous classification of under nutrition was as marasmus, kwashiorkor and marasmic kwashiorkor. But currently, considering the clinical and management aspects of under nutrition it is classified as Moderate Acute Malnutrition (MAM) or Severe Acute Malnutrition (SAM). Severe Acute Malnutrition is defined as very low weight for height (Z-score bellow -3SD of the median WHO child growth standards) or a mid upper arm circumference < 11.5 cm or by the presence of nutritional edema.[4]

### Pathophysiology involved in Severe Acute Malnutrition (SAM)

Body physiology becomes abnormal in SAM due to the phenomenon of reductive adaptation. The systems of body begin to shut down with severe malnutrition. The systems slow down and do less in order to allow survival on limited calories. This slowing down is known as 'reductive adaptation.'

Children with severe Acute Malnutrition are at risk of death from hypoglycemia, hypothermia, fluid overload & infections.

According to Ayurveda Severe Acute Malnutrition is described under *Apatarpanjanya Vyadhis*. *Karshya Vyadhi* [5] and other nutritional disorders like *Balashosha* [6], *Phakka* [7], *and Parigarbhika*[8] could be closely correlated with malnutrition. The main dosha involved in *Karshya* is *Vata*. Management of all these disorders shares a common viewpoint of *Shodhana chikitsa* (either cleansing procedure or medicines), and *Agnideepana chikitsa.* Rest of the medicinal and dietary treatment has to be done after this basic cleansing. This clearly gives the thought of 'enhancement of digestive power'. This enhanced and efficient *Agni* will then function completely to digest heavy diet or medicine and the individual will seldom suffer from *Aama*.

Modern medicinal management of SAM is Well classified into two heads as-

1. Facility based management
2. Community /Home based management

The basic indicator for dividing the management of patient into either of the criteria is 'poor appetite'. Poor appetite, presence of complications like extensive skin lesions, eye lesions and edema are reliable indicators of severity of illness thus requiring Facility based management.[9]

Though the appetite assessment is done meticulously in above protocol but the major lacuna involved is, that there is no appetite enhancer available in mainstream medicinal system with its established safety and efficacy in malnourished children. Whereas Ayurveda contributes to a strong solution. Ayurveda suggests *Ahara vichar* and *Agni chikitsa* as the mainstay of treatment.

## MATERIALS AND METHODOLOGY

Thus the case was managed with composite dietary management based on *Ahara vichar* and *Agni chikitsa* with special reference to chronic malnourishment involved. The treatment principle with which the case was managed were

a) *Agnideepana* and *Aama pachana*
b) Dietary management as suggested in SAM protocol (Homemade Alternative Food Items) which was modified by replacement of oil with *Pippalyadi ghrita.*

Total duration of case study was of 15 days.

This composite dietary management consisted of –

1. Sanjeevani vati..... 1tab (125 mg) BD for 15 days with plain water as anupana
2. Gandhak rasayan……1tab (125 mg) BD for 15 days with plain water as anupana
3. Takra+ Vyosh (combination of shunthi (Zingiber officinale), mareecha (Piper nigrum) and pippali (Piper longum)
4. Khichari & Halwa made in Pippalyadi ghrita based on the SAM protocol. Patient was also on regular diet of roti, sabzi, rice and dal, egg/chicken.

### Case Details

A 8 year old female child was brought by her parents to Kaumarbhritya OPD of Govt. Ayurvedic College Osmanabad. The child was weighting 19.6 kg on admission and presented with complaints as follows:

-Irritability, anorexia….5months

-pitting edema over both legs….1 month

-periorbital edema ….1 month

-multiple skin lesions over both legs, hands, back with mild clear discharge….15 days

**H/O present illness**

This child was suffering from anorexia, mild intermittent abdominal pain since 5 months. 1month before admission patient had walked approximately 20 kms and after this vigorous exertion she developed periorbital edema which got gradually spread over both legs and was pitting in nature. 15 days before due to excessive stretching and itching over skin she developed skin lesions.

**H/O past illness**

No significant H/O previous hospitalization or similar illness in family.

No h/o Koch's or Koch's contact in family

**H/O Family**- not significant

**H/O Immunization**- BCG-given a 2 months of age, but no mark seen

Received interrupted schedule of mandatory vaccination programme

**Birth history**- Prenatal, Perinatal, Postnatal history- not significant

**Dietary history**

Exclusive Breast feeding for 6 months, complementary feeding was initiated at 6 months of age but was insufficient in quality & quantity.

Mother conceived for 2$^{nd}$ child when the index child was 3 months of age Presently she was taking the diet as rice, chapatti, *sabzi*, *dal* in small quantities and irregularly.

Current calorie intake=967 cal energy against 2850 cal need /RDA (150cal/kg/day)

Current protein intake=18 gm of proteins against 43 gm need /RDA (0.95 gm/kg/day)

**Examination**

**Anthropometry**- Height= 120.5 cm; Weight=19 kg; Abdominal girth=53.5cm;

**General examination**- GC- moderate T-normothermic BP=110/80 mm of Hg

**Diagnosis**

Present weight =19.1 kg

Present height=120cm

Weight for height= < -1 SD

Bilateral pedal pitting edema

Ulcerative skin lesions over legs, hands &back

Thus, Severe to Acute Malnutrition with complications

**Investigations**

CBC= Hb-7.5 gm%

WBC-9300/cumm

RBC-3.02×$10^{6/}$mL

HCT-20.2%

MCV-66.89FL

MCH-24.85 Pg

MCHC-37.13 g/dl

Sr. Sodium =132 mmol/L

Sr. Potassium=4.1 mmol/L

Sr. Calcium=1.11 mmol/L

Sr. Total protein-5.1 gm/dl

Sr. Albumin-1.1 gm/dl (N-3.5-5.5 gm/dl)

SGOT-28.0U/L

SGPT-27.2 IU/L

Sr. Creatinine-0.64 gm%

Lipid profile-Sr. Cholesterol-63.0 mg/dl

Triglycerides-142.0 mg/dl

HDL-26.3 mg/dl

LDL-8.3 mg/dl

VLDL-28.4 mg/dl

BSL (Random)-129.0 mg%

Urine (Routine) - Albumin-nil; Sugar-nil

(Microscopic)-Pus cells-nil

RBC's-nil

Casts-nil

Crystals-nil

**Assessment Criteria**

Assessment was done on the basis of

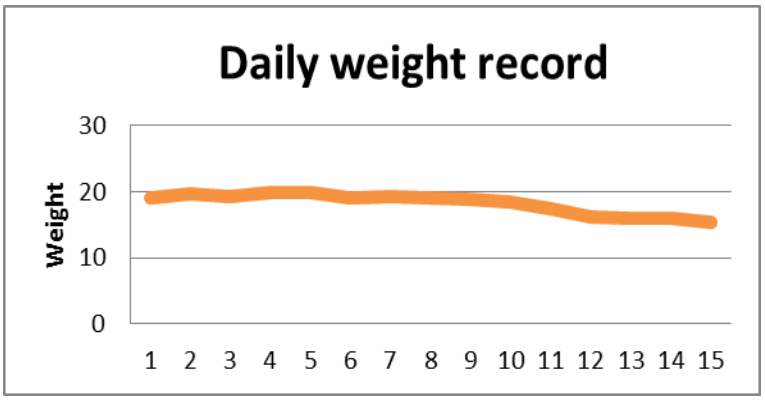
1. Degree of pedal edema
2. Skin lesion changes (discharge, puritis, and lesions) the severity was recorded as

Mild= +; Moderate= + +; Severe= + + +

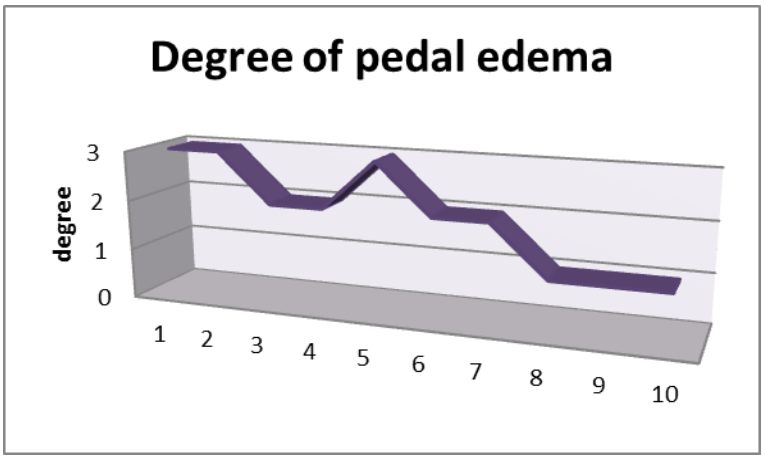
3. Appetite
4. Total calorie & protein intake
5. Daily weight

**Observations**

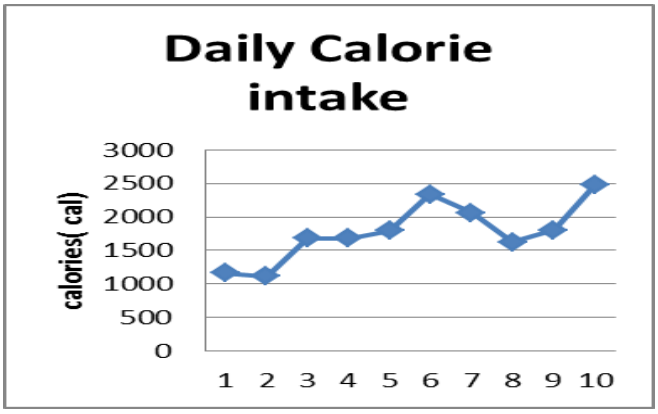
Observations were made on the basis of assessment criteria as mentioned above and the statistical analysis with graphical presentation of observations is as follows-

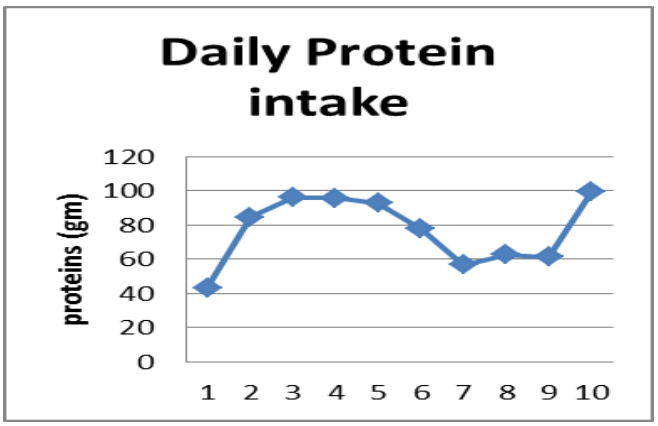



**With advancement of dietary management weight record trend shows downward slant**.

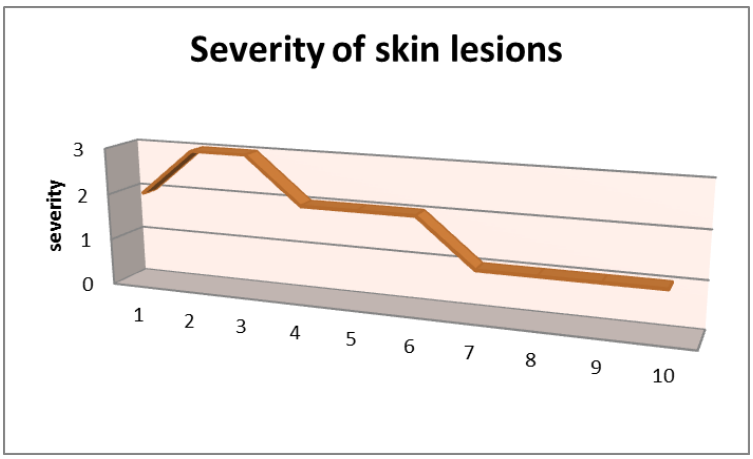



**As days are progressing the pedal edema shows significant reduction.**




**Daily calorie and protein intake record analysis shows increasing pattern.**




**Severity of skin lesions when plotted against the days of treatment shows statistically significant reduction.**

## RESULTS

Thus the result could be drawn from above observations that with the progression of treatment there was decrease in pedal edema with initial weight loss. In spite of weight losing pattern patient showed increase in daily calorie and protein intake with good tolerance. Also the complications i.e. skin lesions showed significant decrease in the severity.

## DISCUSSION

The case was presented as severe to acute malnutrition with complications as ulcerative skin lesions over legs, hands and back with discharge and pruritis along with pedal edema.

Thus facility based management was considered suitable for this case.

Patient had already received the symptomatic treatment for skin lesion but underlying malnourished state was not well attended.

Thus instead of merely providing SAM protocol based management, the case was provided with modified dietary plan. This dietary plan was totally based on Agnideepana and Aamapachana.

Though the *Ahara* (dietary management) in Sever Acute Malnutrition is important factor to consider but appetite remains the decisive factor for digestion. This appetite is totally dependent on the digestive fire or *Agni* which converts the food consumed in various ways into various structural, functional constituents and energy.

Dietary overload leads to formation of Aama (undigested material which is toxic in nature). Thus Aama pachana initiated on admission and continued for 5 days. Aama pachana achieved with administration of Sanjeevani vati.

Ama pachana enhances Agni and prepares it for more efficient working. Such well formed digestive fire can properly assimilate diet and convert it in well nourished dhatu.

Vyoshyukta Takra was given regularly after 5 days of admission and initial work up. The quantity of takra was kept in the range of 100 to 400 ml/day. Vyosh/trikatu (shunthi, mareecha, pippali) is said to be the best kaphaghna, and Agnideepak.[10]

Takra kalpana was used to reduce the edema along with Agnideepana as mentioned the best treatment for Grahaniroga.[11]

Patient had given the history of excessive walking of approximately 20 km before appearance of edema. Considering ‘atichankraman’ as the main etiological factor of edema, mentioned in nidana of vatika shopha.[12], vatashamak treatment was initiated in the form of snana and abhyanga with teela taila.[13]

This all resulted in increased urine output, reduction in excessive gained weight, improvement in appetite which reflected in the increasing daily calorie and protein intake.

*Khichari* and *Halwa* mentioned in the F-SAM protocol under the heading of 'Homemade Alternative Food Items' in the form of catch-up diet[14] was started and the contents of them are as follows.

**Table No. 1: khichari.**

| **Ingredients** | **Amount for 1 kg *Khichari*** |
|---|---|
| Rice | 120 gms |
| Lentils (dal) | 60 gms |
| Edible oil | 70 ml |
| Potato | 100 gms |
| Pumpkin | 100 gms |
| Leafy vegetables | 80 gms |
| Onion (2 medium size) | 50 gms |
| Spices (ginger, turmeric, coriander powder) | According to taste |
| Water | 1000 ml |
| Total calories/kg<br>Total proteins/kg | 1442 kcal<br>29.6 gms |

**Table No. 2: *Halwa.***

| **Ingredients** | **Amount for 1 kg** |
|---|---|
| Wheat flour (atta) | 200 gms |
| Lentils(dal)/Besan/Moong dal powder | 100 gms |
| Oil | 100 ml |
| Jaggery/Gur/Sugar | 125 gms |
| Water to make thick paste | 600 ml |
| Total calories/kg<br>Total calories/100gm<br>Total proteins/kg<br>Total proteins/100 gms | 2404 kcal<br>240 kcal0<br>50.5 gms<br>5.05 gms |

Edible oil was replaced with *Pippalyadi ghrita* which is best Agnideepak in nature.[15]

Skin lesions were ulcerative in nature with mild clear discharge and pruritis. Along with oral medications regular wound care was also opted.

Medicinal treatment was consisted of *Sanjeevani vati* and *Gandhak Rasayan vati* in following doses.

*Sanjeevani vati*- 125 mg tablet; 1BD for 15 days
*Gandhak Rasayan*- 125 mg tablet; 1BD for 15 days

*Sanjeevani vati* is best *Aamapachak* and *Agnideepak*[16], whereas *Gandhak Rasayan* was prescribed considering reduction of infection and healing of skin lesions.[17]

For palatability purposes and for maintaining interest regarding food the normal congenial diet, rich in calorie and protein was also continued.

## CONCLUSION

Severe Acute malnutrition shows the reductive adaptation of body physiology. This shut down process of working of body systems needs gradual correction in calories, proteins and other essential nutrients. But digestion of this intake totally depends up on the Appetite and digestive capacity of an individual. This digestive capacity, transforming power is termed as *Agni* in Ayurveda. *Agni* the digestive fire plays a pivotal role in maintaining nutritional status of an individual. This digestive heat decomposes, separate and break-down substances into simpler form which could be easily assimilated by various tissues of the body. This case study of Severe Acute Malnutrition focuses and concludes that though diet is calorie and protein rich and also administered in systematic way, still *Agni chikitsa* remains the mainstay of treatment even in pediatric population.

**Day 1 Day15**

**Day 1 Day 9 Day 15**

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