

AN APPRAISAL ON PROTEIN ENERGY MALNUTRITION ETIOPATHOGENESIS ON AYURVEDA BACKGROUND - A LITERARY REVIEW

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ABSTRACT

Protein energy malnutrition is the most common health problem in children that has stressed the entire health society since last few decades. In spite of tremendous advancements in the science the percentage of malnourished children is still increasing and creating a burden over health budget as well. References of disorders similar to malnutrition are found in many Ayurveda treatises. Ayurveda emphasizes over etiopathogenesis of Malnutrition and many causative factors like *Parigarbhika*, *Stanyadosha* are described at different places. Ayurveda being a holistic science, treatment principals described under malnutrition can be implied now to fight this big health hazard. Malnutrition hampers physical as well as mental health of children. It is a disorder which brings many complications in the initial phase of life cycle of human being i.e. childhood. It averts children from reaching their intellectual and productive phase. So, it is the need of hour to find a solution of this besieged problem through Ayurveda science.

Keywords: Malnutrition, Ayurveda, Etiopathogenesis, *Parigarbhika*, children.

INTRODUCTION

Malnutrition is a condition that results from eating a diet in which one or more nutrients are either not enough or are too much such that the diet causes health problems. It may involve calories, protein, carbohydrates, vitamins or minerals.¹ PEM is measured in terms of underweight (low weight for age), stunting (low height for age) and wasting (low weight for height). The prevalence of stunting among under five is 48% (moderate and severe) and wasting is 20% (moderate and severe) and with an underweight prevalence of 43% (moderate and severe)². The majority of children suffering from under nutrition (80%) are the mild and the moderate forms which go unnoticed³. Under nutrition makes the child susceptible to infection and complements its effect in contributing to child mortality. This ac-

counts for 22% of the burden of disease in India and adversely affects the economic growth of the country with an estimated adult productivity loss of 1.4% of gross domestic product (GDP).⁴ Malnutrition, in all its forms, includes under nutrition (wasting, stunting, and underweight), inadequate vitamins or minerals, overweight, obesity, and resulting diet-related non-communicable diseases. 1.9 billion adults are overweight or obese, while 462 million are underweight. 52 million children under 5 years of age are wasted, 17 million are severely wasted and 155 million are stunted, while 41 million are overweight or obese. Around 45% of deaths among children under 5 years of age are linked to under nutrition. These mostly occur in low- and middle-income countries. At the same time, in these same countries, rates

of childhood overweight and obesity are rising. The developmental, economic, social, and medical impacts of the global burden of malnutrition are serious and lasting, for individuals and their families, for communities and for countries.⁵

Ayurvedic background-

There is no direct reference available in Samhitas regarding the disease *Karshya* in children but after a gross outlook of the Samhitas, it can be said that *Karshya* has been described as a pre stage of other diseases.

Kashyapa Samhita: The reference of *Sandanshi Jataharini* is similar to *Parigarbhika*, and *Karshya* found as a early symptom of *Parigarbhika*⁶. *Karshya* as a symptom of *Kshudita* person has been mentioned in *Bhojanakalpa Adhyaya*⁷. *Karshya* has been described as a prestage of *Kshiraja Phakka*⁸. *Kshina Mamsa* has been described as a symptom of *Vyadhija Phakka*⁹.

Ashtanga Samgraha: Maharshi Vagbhata has mentioned *Karshya* as a early symptom of *Parigabhika*¹⁰. “*Kumarah shushyati* “this reference is found in the description of *Balshosha*¹¹.

Charaka Samhita: Acharya Charaka in Chikitsasthana said that child become *Krishna* due to intake of *Vatadushta* milk¹². Acharya Charaka in Sutrasthana has described 8 type of undesirable person from treatment point of view, *Atikrishna* is one of them¹³.

Sushruta Samhita -*Atikarshya* has been described with its *Nidana*, *Samprapti Lakshana* and *Chikitsa*¹⁴ Acharya Dalhana explains *Dhatukshya* as the main event and thus this falls *Karshya* under the heading of *Apatarpanatmaka* diseases¹⁵.

Madhava Nidana: Madhavakar also said that child become *Krishna* due to intake of *Vatadushta* milk¹⁶. The above references are the indirect references of the disease *Karshya* and other extreme form of malnutrition in children.

Yogaratanakar: It is only Yogaratnakar who has devoted a chapter to the treatment of the disease *Karshya* in children in *Balroga chikitsa Karshyadhikar*¹⁷.

Untimely and little than the required food is prime factor in producing *krishata*¹⁸. *Tikta*, *Katu*, and *Kashaya Rasas* are supposed to produce *Karshya*¹⁹. *Krishangata* has been included in the *Rasa Pradoshaja Vyadhi*²⁰. In addition to above reference,

the word *Krishna* has been used at many places under different contexts. Bhavaprakash has been devoted a separate chapter “*Karshyadhikar* for describing the symptomatology, etiology, pathogenesis, prognosis and treatment of *krishna* person²¹. Sharangadhar had included it under the heading of *Nanatmaja Vyadhi* of *Vata*, those diseases caused absolutely by *Vata Dosha*²². Acharya Kashyapa includes the condition *Karshya* as a disease caused by *Vata*²³.

There are many conditions described in various Ayurveda treatises which are basically the important causative factors of *Karshya*. These factors are described below.

Balashosha- This disease is explained by Vagbhata. As the name suggests there is depletion of body due to depletion of subcutaneous tissues and fat. Pathology of development of *Balshosha* is almost similar to Protein energy malnutrition (PEM). There are many reasons because of which child remains deprived of nutrition.²⁴ Ayurveda explains the *Balashosha Nidanrthakar* factors as *Atiswapna*(excessive sleep), *Atiambu sevana* (excessive water intake), *Shitambu pana* (drinking chilled water), *Shlaishmika Stanya* (vitiated breast milk)etc.

Parigarbhika- This is a special nutritional disorder explained in Ayurveda, which highlights the development of malnutrition during infancy period. If a breastfeeding mother becomes pregnant again in one year, it will result in decreased breast milk secretion due to hormonal imbalance. Hence, there will be stoppage or decrease in adequate breast milk secretion and the first child will be deprived of enough breast milk in its *Ksheerad Avastha*.^{25,26} When conditions like *Parigarbhika*, *Balashosha*, inadequate food supplementation persists for long time, it results in a stage of emaciation with loss of general health. Essential proteins, fats, carbohydrates, glycoproteins and lipids are no more available due to lack of breast milk, disturbed digestion and cellular metabolism and slowly the child lands up in *Marasmus*.

Phakka Roga- *Phakka vyadhi* is described by Acharya Kashyapa which is the speciality of Kashyapa Samhita. In *Phakka*, even after reaching one year of chronological age, child is not able to walk few independent steps suggesting delayed developmental milestones of locomotor system and immaturity of central nervous system. There is continuous deterioration of general health, physical as

well as mental. Due to running down condition, child is immune compromised and child may land into FTT (Failure to thrive). There are three types of *Phakka vyadhi* namely *Ksheeraja*, *Garbhaja* and *Vyadhija*. It is well proven that child becomes Malnourished in all the three types of *Phakka* and *Karshata* is found in *Phakka* patient.²⁷

Graharoga- This is also a unique concept of Ayurveda where *Stanya* can be vitiated by *Graha* and this vitiated *Stanya* do not fulfill the nutritional needs of a child. Also a *Grahapidita* child faces a severe type of chronic illnesses like Diarrhea and child becomes deprived of nutrition. Kashyapa though has not described the disease *Parigarbhika*, but while explaining *Jataharini* it is clearly mentioned that if a woman becomes pregnant again while the first child is breast feeding, then the prior child will definitely get influenced by *Shushka Revati*. Symptoms of *Shushka Revati* are similar to Marasmus and if it gets worst child may die due to malnutrition.

Modern view-

Protein-energy malnutrition can also be classified as marasmus, kwashiorkor, or a combination of both. In marasmus conditions are characterized by extreme wasting of the muscles and a daunt expression; where kwashiorkor is identified as swelling of the extremities and belly, which is deceiving to their actual nutritional status.

Malnutrition is the condition that results from taking an unbalanced diet in which certain nutrients are lacking, in excess (too high an intake), or in the wrong proportions. A number of different nutrition disorders may arise, depending on which nutrients are under or overabundant in the diet.²⁸

Classification of **Protein Energy Malnutrition**²⁹:

I. Syndromal Classification

- Kwashiorkor
- Nutritional marasmus
- Marasmic Kwashiorkor
- Prekwashiorkor
- Nutritional dwarfing (Stunting)

II. Gomez Classification

According to this classification, PEM is graded with reference to the weight for age as percentage of the expected weight (Harvard Standard) :

- First degree : Weight between 90 and 75% of expected for age
- Second degree : Weight between 75 and 60% of expected for age
- Third degree: Weight below 60% of expected.

III. Welcome or International Classification

- Weight between 80 and 60% of expected for age:
 - With edema kwashiorkor
 - Without edema undernutrition
 - Weight below 60% of expected
 - With edema marasmic kwashiorkor
 - Without edema nutritional marasmus

IV. According to the Indian Academy of Pediatrics (IAP)

- First degree : Weight between 80 and 70 % of expected for age
- Second degree : Weight between 70 and 60 % of expected for age
- Third degree : Weight between 60 and 50 % of expected for age
- Fourth degree : Weight below 50 % of expected

V. Jellife Classification

- First degree : Weight between 90 and 80% of expected
- Second degree: Weight between 80 and 70% of expected
- Third degree: Weight between 70 and 60% of expected
- Fourth degree: Weight below 60% of expected

VI. McLaren Classification

- Mild : Weight between 90 and 80% of expected
- Moderate : Weight between 80 and 70% of expected
- Severe : Weight below 70% of expected

VII. Water low Classification

- Acute : Weight for height low, (wasted but not stunted) Height for age normal
- Acute / Chronic : Weight for height low, (wasted and stunted) Height for age low
- Nutritional dwarfing Weight for height normal, (stunted but not wasted) : Height for age low

VIII. WHO Classification Criteria	Moderate PEM	Severe PEM
Symmetrical edema	No	Yes
Weight for height (Index of wasting)	70-79% of expected (Wasting)	< 70% of expected (Severe wasting)
Height for age (Index of stunting)	85-89% of expected (Stunting)	< 85% of expected (Severe stunting)

Common causes of PEM-

1. Poor nutrition due to poverty, less quantity of food and incomplete food.
2. Social issues like neglected child, child abuse, child labour.
3. Malabsorption due to some metabolic disorders
4. Surgical problems like GIT surgeries, congenital problems.
5. Faulty method of food intake eg. *Viruddhahara, Vishamashana*
6. Poor sanitation
7. Large families
8. Chronic illness like diarrhea.
9. Maternal malnutrition
10. Increased intestinal loss and anorexia
11. Working mother
12. Secondary malnutrition due to some diseases like tuberculosis.
13. Inadequate medical facilities.

Hypothesis of PEM-

1. Dietary hypothesis- in marasmus energy deficiency will be seen whereas in Kwashiorkor protein deficiency will be seen.
2. Adaptation hypothesis- Marasmus is an extreme degree of adaptation to a prolonged deficiency of protein and energy whereas kwashiorkor is a state of adaptation failure.
3. Free radical hypothesis- kwashiorkor is due to excess production of free radicals by means of infections, toxins and also due to degree of adaptation to prolonged deficiency of protein and energy.
4. According to some- excessive accumulation of Alfa- toxin which gets accumulated in the body through the food.

Treatment of Malnutrition- Ayurveda

Balshosha- powder of *Trikatu, Manjishtha, Patha, Girikadamba, Saindhava Lavana* mixed with *Madhu* and *Ghritha* is given. Also *Vidarikandaadi Churna* and *Ashwagandha ghritha* can be used internally. *Pradeha, Utsadana, Abhisheka* with medicated things also give good results in *Balshosha*.

Parigarbhika- *Agni Deepana* is the main stay of treatment. For *Agni Deepana Pippali, Pippalimula, Katuka, Devdaru, Kshardvaya, Bilva* etc. should be used.

Phakka Roga-

1. *Nidana Parivarjana*
2. *Agni deepana*
3. *Nutritional supplementation*
4. *Ashvasana Chikitsa*
5. *Shodhana chikitsa*
6. *Balya Chikitsa-Mansa Yusha, Samskarita Ghritha, Payasa, Shali Anna* are given to improve strength.
7. *Abhyanga with Rajtaila*
8. *Basti, Snehapana, swedana, Udvartana*
9. *Trichakra Phakkaratha*

Treatment of PEM- Protein Energy Malnutrition

- Nutritional rehabilitation at hospital level.
- Parents counseling regarding importance of carbohydrates, feeding techniques etc.
- Stress should be given on locally available economical food rather than giving expensive food items.
- Hyderabad protein energy rich mixture for home treatment. This mixture contains roasted wheat-40 gram, roasted Bengal gram-16 grams, roasted ground nut 10 grams added with jiggery. Total 86 grams provide 330 kcal and 11.3 grams of protein.
- Give small amount of food in small interval.

DISCUSSION

PROTEIN ENERGY MALNUTRITION is a condition which affects physical as well as mental wellbeing of child. There is a direct relationship between PEM and immunity. An immunocompromised child is more prone to PEM and vice versa. This concept can be well understood by above mentioned etiological factors like *Parigarbhik*, *Balshosh*, *Kshiraj Phakka* etc. According to Ayurveda Karshya is a Vata predominant condition with Agni vitiation (Agni Dushti). In view of the above conditions, the treatment modalities mentioned are Agni Deepana, Pachana, Brimhana etc. Ayurveda science believes *Agni Dushti* as root cause for all diseases. So, first line of treatment is Agni Chikitsa. After this, For Brimhana purpose Ayurveda Kalpa like Prinana Modaka can be prescribed. *Basti* has also been mentioned in Karshya Chikitsa. As mentioned earlier, Karshya is a Vata predominant disease and Basti is Best chikitsa of Vata Dosha, it helps in Malnutrition. Treatment principles of Ayurveda include Nidana Parivarjana also. In this context, child should be prevented to get affected by lack of sanitation, large families etc. Every child should get sufficient quantity nutritious food. For this purpose, there should strict implementation of programs like Family planning, mid day meal etc. Breast feeding should be promoted at each strata of nation.

CONCLUSION

Children are the backbone of nation and Future of a nation always depends on a healthy youth. Malnutrition is a real trouble in childhood. WHO has developed many policies and Government is also running many health programs for malnutrition but strict implementation and monitoring of the programs are need of the day. Malnutrition has a deep relationship with mother's health. So, it is important to look at mother's health throughout pregnancy. Every Child strictly should get breast milk up to six months. Ayurveda pathophysiology of Malnutrition has a very scientific base. The key of successful treatment is correct diagnosis and to rule out the causative factors of malnutrition and follow the Ayurveda treatment principles like *Nidan-parivarjana*, *Agni chikitsa*, *Brimhan chikitsa* etc. Malnutrition should be studied in an innovative way by considering Ayurvedic etiopathogenesis and Ayurveda should be promoted to scuffle malnutrition.

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