

An Ayurvedic Approach on Protein Energy Malnutrition W.S.R. to Balsosha

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ABSTRACT

When the body of child does not receive the necessary quantity of protein, vitamin, mineral, and other nutrients to maintain good health, there is condition called malnutrition occurs. Food is considered the primary source of energy because of its ability to regulate bodily circumstances from conception through subsequent growth stages. For humans, appropriate nutrition is a big challenge. The condition which follows from abnormal nutrition is called malnutrition. The term "malnutrition" refers to both excessive and insufficient eating. Ayurvedic texts describe nutritional disorders in a fragmented manner. The diseases which originate from the vitiation of *Rasavaha Srotas*, *Balsosha* is considered in one of them. The name *Balsosha* is composed of the syllables "Bala" and "Shosha," which together imply "child emaciation." According to descriptions found in *Ayurvedic* scriptures, children's nutritional deficiencies—known in modern science as protein energy malnutrition—are the cause of this emaciation. It is a physical condition or process that results from improper food intake results in low immunity infection, poor growth, reduced cognitive development, etc. *Ayurveda* is based on curative as well as preventive measures. Ayurvedic approach is the prevention and treatment of *Balsosha* involve enhancing a child's *Agni* and immune system through a healthy diet and the use of herbal remedies.

Key words: *Balsosha*, Malnutrition, PEM (Protein Energy Malnutrition), Nutrition, *Ayurveda* etc.

INTRODUCTION

Malnutrition is a condition in which there is inadequate consumption, poor absorption or excessive loss of nutrients. The term malnutrition refers to both Undernutrition as well as Over nutrition. However, sometimes malnutrition and protein energy malnutrition (PEM) are used interchangeably, growing children are most vulnerable to its consequences. Their nutritional status is a sensitive indicator of community health and nutrition¹. The extent and severe effects of childhood malnutrition on children's survival and development make it one of the biggest

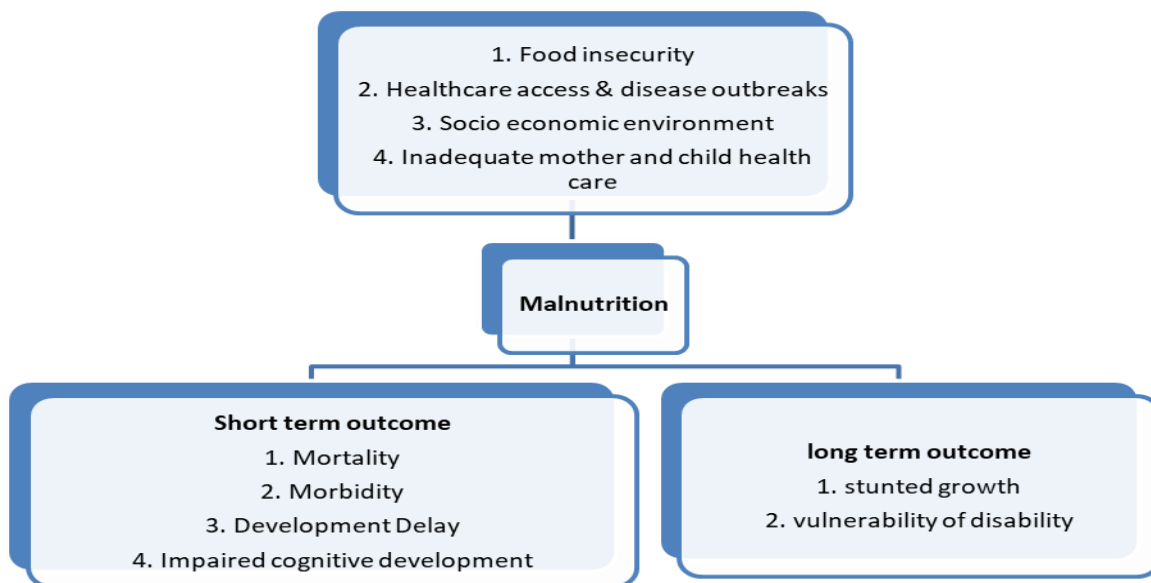
public health issues of our day. Children in developing nations are dying at the highest rate possible from malnutrition. Among children under five, it is the cause of almost half of the approximately 11 million annual deaths in this age group². Growth and development have a direct relationship with nutrition. When growth and development are at their highest during childhood period. A youngster has to receive appropriate nutrition supplements in order to meet the growing body's essential calorie requirements. A complete meal should have all of the necessary nutrients, including water, minerals,

vitamins, protein, fat, and carbohydrates. Inadequate intake, poor absorption, or excessive loss of nutrients are conditions characterized by undernutrition; malnutrition and protein-energy malnutrition are sometimes used.

According to a recent national study, severe acute malnutrition affects 7.5% of Indian children. According to the Sample Registration System 2016 Report, diseases brought on by malnutrition claim the lives of more than 9.6 lakh children under the age of five each year. With 1.21 billion inhabitants, India is the second most populous country in the world, behind China. According to the census data, the number of children in the population increased by 181 million and decreased by 5.05 million between 2001 and 2011. Hunger and inadequate food security are the primary causes; according to the

Global Hunger Index, in 2017 there was only 100th place out of 119 nations; by 2021 that number had dropped to 101st out of 116. India's economy is growing slowly due to a high mortality rate, low production rate, and rising rates of malnutrition brought on by the country's growing population³. For children under five, malnutrition represents the most serious outcome of food poverty. In addition to impairing cognitive and physical development and raising the risk of concomitant infections, acute malnutrition can result in morbidity, mortality, and disability. 11A child's essential right is the development of their physical and mental well-being, and access to optimal health can be achieved with appropriate dietary support. The effects of malnutrition on children under the age of five are depicted in Figure No 1⁴

Figure No 1.



The highest rate of undernutrition among children worldwide is seen in India, which has negative effects on economic growth, productivity, sickness, and mortality. In India, 43% of children under five were underweight and 48% were stunted, according to the NFHS 3 Survey. As per UNICEF's 2011

figures, Kerala is responsible for 23% of underweight, 24.5% of stunted, and 16% of wasting children. During a child's most critical developmental stage, undernutrition can cause irreversible impairments later in life. Malnutrition includes both over nutrition and undernutrition, and the terms

undernutrition and malnutrition are interchangeable⁵. It is estimated that undernutrition throughout childhood accounts for 45% of all fatalities in children mal the age of five. 36% of Indian children under five are underweight, 38% are stunted, and 21% are wasted, per the National Family Health Survey (NFHS) 4, which was conducted in 2015–16. Children that are underweight are more common in rural areas (38%) than in urban areas (29%). Twenty to thirty percent of infants are already undernourished during the first six months of life, frequently as a result of low birth weight. After four to six months, the percentage of undernutrition and stunting begins to rise.⁶

PROTEIN ENERGY MALNUTRITION

WHO describes, PEM is a group of pathological diseases that are typically linked with illness and occur most frequently in newborns and young children. These conditions arise from a concurrent shortage of protein and caloric in different proportions. The severity of PEM is correlated with varying degrees of weight loss and growth retardation. In the early stages, there is weight loss linked to subcutaneous fat and muscle mass loss and many critical organ dysfunctions, which result in a variety of clinical features that worsen with time. There is also immune system damage and an increasing failure in the body's homeostatic mechanisms, which can lead to infections, shock, and even death. One of the conventional symptoms, namely Marasmus, Kwashiorkor, or Marasmus-kwashiorkor, is linked to moderate malnutrition.

MARASMUS is characterized by a noticeable loss of muscle and fat, which are used up to produce energy. Severe wasting is the primary symptom; the child has no fat and looks extremely skinny. The thighs, buttocks, and shoulders are severely wasted. The aged or wrinkled features known as "monkey face" are caused by the loss of the buccal pad of fat.

The term "baggy pants appearance" describes the buttocks' loose skin falling down. Axillary pad of at may also be lessened; despite this, affected children may still be alert. No edema is present.⁷

KWASHIORKOR- it is usually affecting children aged 1-4year. The main sign is pitting edema, the child may have a fat sugar baby appearance. Edema ranges from mild to gross and may represent up to 5-20% of body wt. muscle wasting always present and child unable to stand or walk. The skin lesion consists increased pigmentation, desquamation and depigmentation may confluent resembling flaky paint or in individuals enamel spots. Petechial may be seen over abdomen, smooth tongue, cheilosis and angular stomatitis, herpes simplex' stomatitis also be seen in Kwashiorkor.1Marasmic Kwashiorkor it is mixed form of PEM and manifest as edema occurring in children who may or may not have other sign of kwashiorkor and have varied manifestation of marasmus.⁸

CAUSES OF MALNUTRITION: The availability, accessibility, and use of food and healthcare services interact in a complicated way to cause malnutrition in children under the age of five.

- Nutrition specific factors include inadequate food intake, poor caregiving and parenting, improper food practices and infectious comorbidities.
- Nutrition-sensitive factors include food insecurity, inadequate economic resources at the individual, household, and community levels. Limited or poor access to education, healthcare services, infrastructure and poor hygienic environment are other nutritional sensitive factors that adversely affect the children under the age of 5-year nutritional status.⁹
- Ignorance – Neglected breast feeding, artificial feeding, dirty formula feed, hypo

or hyper diluted milk formulas, early weaning from the breast.

- Medical reasons like infections, diarrheal episodes, malaria, measles, worm infections etc.
- Inadequate medical facilities.
- Maternal malnutrition.
- Working mother.
- Secondary malnutrition due to tuberculosis, diabetes, metabolic disorders, Intestinal malabsorption.¹⁰

CLASSIFICATION¹¹

PEM is a generic condition that causes complaints. The degree, duration, and relative contribution of an energy or protein shortage resulting in anthropometric clinical and biochemical indicators determine its classification.

Table 1. WHO classification

Nutritional Status	Body weight as % standard for age	Edema	Deficit in weight for height
Under weight	80-60	0	Minimal
Nutritional dwarfism	< 60	0	Minimal
Marasmus	< 60	0	++
Kwashiorkor	80-60	+ / ++	+ / ++
Marasmus Kwashiorkor	< 60	+	++

Table 2. IAP Classification

Nutritional Grade	% of standard weight for age
Normal	>80%
Grade 1	71-80%
Grade 2	61-70%
Grade 3	51-60%
Grade 4	< 50 %

AIM AND OBJECTIVES

- To evaluate the correlation of Protein Energy Malnutrition under Ayurvedic aspect
- To describe the *Balsosha*, its etiology and pathogenesis.

MATERIALS AND METHODS: Classical texts books of *Ayurveda*, different internet sites, journal publications and various clinical studies.

AYURVEDA ASPECT

Malnutrition which is said to be a nutritional deficiency disorder viewed under *Apatarpanjanya Vyadhis*. *Balsosha* disease similar to PEM (Protein Energy Malnutrition) is one of the diseases related to *Rasavaha Srotasa*. *Acharya Vagbhata* provides a description of *Balsosha*. As the term implies, there will be *Shosha*, or the body becoming

emaciated as a result of the loss of subcutaneous tissues and fat. Protein Energy Malnutrition (PEM) and the pathology of *Balashosha* development are quite similar. It happens as a result of growing youngsters consuming insufficient calories from food. Energy deficit results from a lack of carbohydrates, which are the main source of energy and must be consumed in sufficient amounts. A slim, emaciated body is the result of these, which start the breakdown of fat for energy and deplete subcutaneous tissues and body fat. Proteins in the body are used to provide energy once the fat supply has already been exhausted. The building blocks of all actions are proteins.¹²

Bala: Various Acharyas hold slightly different opinions about the top bound of *Balyavastha*. *Balyavastha*, according to *Acharya Charaka*, *Shusruta*, *Astanga Sangraha*, and *Ashtanga Hridaya*, can last up to 16 years; but, according to *Kashyapa*, it can last up to 1 year or during nursing.

Shosha: *Shosha*, as defined by *Sushruta*, is the state in which all seven *Dhatus* are dry. *Rasa*,

Rakta, Mansa, Meda, Asthi, Majja, and Shukra are the seven *Dhatus*. All of the body's functions and structure are preserved by these *Dhatus*. Additionally, they have two functions: *Poshana* and *Dharana*. Every *Dhatu* carrying out its particular role bestows *Poshana* upon the subsequent *dhatu* as mentioned in the preceding sequence. Thus, if one *Dhatu's* development and nourishment are disrupted, all subsequent *dhatu*s will also be affected.

A) NIDANA (ETIOLOGY)

1. *Atiswapna* (sleeping too much)
 2. *Ati-Ambu sevena* (overindulgence in water)
 3. *Ati-shitambu sevena*, or consuming too much cold water or liquid
 4. *Shlaishmik Stanya Sevana*
- **Atiswapn:** Meaning is child has been indulging in excessive sleep. This indicates a dull inactive child with lack of interest. This is an important finding of Kwashiorkor in the advanced stage.
 - **Ati Ambu sewan:** Excess intake of water before meal makes the person Karshya by

decreasing the digestive power. Excess intake of liquid food leads to early satiety with subsequent calorific insufficiency and emaciation due to catabolism of stored fat in the body (subcutaneous body fat).

- **Ati Shitambhu:** Cold water ameliorates the *jatharagni* (weak digestive fire) which cause *agnimandya*.
- **Shlaishmik Stanya Sevana:** Breast milk vitiated with *Kapha* leads to an excess accumulation of un-digestible fat in breast milk with change in its nutritional value (*Guru*). By all the above causative factors *Kapha* will abnormally increase in the body, supervening *Agnimandya* and *Ama* formation, which further blocks the *Rasavaha Srotas*. Thus, the total body digestion and metabolism gets hampered with decreased production of metabolic end products in the blood due to which tissues will suffer badly (depleted *Dhatu* formation on obstruction of the *Rasavahasrotus*). This leads to increased catabolism and decreased anabolism.¹³

B) SAMPRAPTI (PATHOPHYSIOLOGY)



C) RUPA (CLINICAL FEATURES)¹⁴

In *Balashosha* there is *Vridhi* of *Kapha Dosh*a as well as *Kshaya* of *Rasa Dhatu* and

further *Dhatus*. This *Balashosha* exhibit the clinical features of *Rasa Kshaya* like *Aruchi* (anorexia), *Pratishyaya* (coryza), *Jwara*

(pyrexia), *Kasa* (cough), *Shosha* (emaciation), *Snigdha Mukha* (paleness of face), *Singdha Netra*.

MANAGEMENT OF BALSOSHA

Eliminating the cause and maintaining homeostasis of vitiated *Doshas* and *Dushyas* is the main line of treatment.

The following approach should be adopted for treating Balsosha.

1. **Srotasdusti:** To remove *Rasa Vaha Srotas* obstruction, one should perform *Shodhan Karma*. The kids are sensitive. Therefore, it is not possible to practice full-fledged Panchakarma treatment here. However, medicated milk is provided as a purge for *Shodhan* purposes.
2. **Agnideepana:** Attempts are undertaken to activate *Agni* in order to improve the *Dhatu's* reduced metabolism following the removal of the *Srotas* blockage. Drugs like *Deepana* and *Pachana*, which raise *Jatharagni* and therefore *Dhatwagni*, are used to achieve the *Agni* status normal. In malnourished children salivary gland become atrophied, liver show fatty infiltration, pancreatic acini are atrophied. In intestinal mucosa villus high reduced. Total absorption surface reduced, so here it is necessary to promote digestion and absorption. For example, food is given fried with *Hingu* and *Jeeraka*.
3. **Bringingana Chikitasa:** Now that the child's *Agni* has been balanced with *Deepana* and *Pachana* medications, so, that child can properly digest and metabolize the food. Therefore, nutritional treatment uses nutrient tonics or restorative medications to strengthen and promote the *Dhatu's*. Various *Ayurveda* preparations like *Sishushosha Nasaka Ghrita*,¹⁵ *Ashwagandhadi Ghrita*,¹⁶ *Suvarna Yoga*¹⁷ like combination of *Suvarna Bhasma with Goghrita, Vacha & Kustha* or *Suvarna Bhasma* along with *Goghrita, Madhu, Matayashi &*

Shankhpusphi or *Suvarna Bhasma with Goghrita, Madhu, Vacha & Arkapusphi* or *Suvarna Bhasma with Goghrita, Madhu, Sweta Durva and Kayphala, Priayal Modaka, Bajara Modaka, Tiladi Yoga*,¹⁸ *Shatavari Churna, Vidarikandadi Yoga*¹⁷ etc are best *Bringingana Dravya* enumerated in *Ayurveda* Textbooks.

4. **Abhyanga-** *Abhyanga* with medicated oils like *Soshanashaka Tail*,¹⁹ *Lakshadi Tail*²⁰ are beneficial in these children.
5. **Diet:** The diet needs to be balanced, tasty, and simple to digest. It should be mentioned that a child's diet should be raised gradually based on their capacity for digestion. If the mother's milk is vitiated or inadequate, artificial feeding is indicated.

A child's nutrition should be properly provided with the understanding of *Ashta-Aahara-vidhi-Visheshtayana*. *Ahara Vidhi Visheshytana's Rashi, Upyogasamstha*, and *Upyokta* play a crucial role in the managing the malnourished children. These regulations are not being followed in today era, leading to fast food and junk food eating habits that can cause *Agnimandhya* and malnourishment too. A child's diet should be based on his or her ability to digest food, as shown by the *Rashi*, which is the amount of food. The impact of either amount of food is significant. Dietetic rules known as *Upyogsamstha* pertain to the what, how, and when of food consumption and might differ depending on the *Satmya* of each child. In order to get the health advantages of food consumption, *Upyokta*, or food consumers, are essential. By keeping pathways clear, *Ahara Vidhi Visheshytayana* improves the availability of nutrients.²¹

DISCUSSION

Childhood nutrition is an integral component of a multifocal relationship with health, economic, social developments, and political system of the country. Child malnutrition under the age of 5 years has a great influence

on the cultural, social, economic and community food practices. Unlike adults, the nutritional status of children is directly influenced by maternal health during pre-pregnancy, pregnancy and breastfeeding. Primary health care is the entry point for the fulfilment of community healthcare needs. Primary healthcare providers play a vital role in screening, early identification, appropriate referral and integrated management of malnutrition in children under the age of 5 years¹⁶. In every person's life, nutrition plays a crucial role. The complex, natural components known as nutrients are what make up food. An adequate and well-proportioned diet (*Ahara*) offers all the nutrients needed. Correct *Ahara* promotes *Arogya* (health) while incorrect *Ahara* leads to illness, according to *Acharya Kashyapa*. Nutrition disorders result in either excessive or insufficient intake of food. Malnourishment ailments such as *Parigarbhika*, *Balashosha*, *Phakka*, *Karshya*, and *Sthaulya*, among others. *Vagbhata* elaborates *Balashosha*. Emaciation caused by the disease's resultant loss of tissues and subcutaneous fat. *Balashosha* pathology is most similar to malnutrition from protein. A malnutrition-related nutritional condition called *Balsosha* was identified by *Acharya Vagbhata*. *Ayurveda* describes a number of malnutrition conditions, including *Balsosha*, *Karshya*, *Phakka*, and others. These are all connected to malnutrition, energy, and protein. *Agnimandya* is the main cause of *Balsosha*. Children's normal physiology is altered in *Balsosha* due to *Agnimandya*. Success in management is improbable if *Balya* and *Bringham Chikitsa* without restoring *Agni*. Correct *Agni* must be achieved initially by the use of *Ushna-Tikshna-Veerya* medications. Treatment for *Bringham* and *Balya* might begin after *Agni* is restored. A well-planned and appropriate diet is essential for both managing and preventing malnutrition. Malnutrition has been one of

India's biggest issues for a long time. The management of malnutrition can yield better results if we apply the ideas of *Agni Deepana* and *Aahara-Vidhi-Visheshtayana*.²²

CONCLUSION

The significance of *Ahara*, the *Mahabhaishajya*, in everyday life is also indicated by *Acharya Kashyapa*, who is considered the *Trayopstambha*. Nutritional disorders in the pediatric age group, such as *Balsosha*, are caused by inappropriate or insufficient food consumption. On seeing its etiopathogenesis *first step in the treatment of Balsosha* is breakdown of its *Samprapti* (pathogenesis) then correction of *Agni* by *Agnideepana Chikitsa*. Then start good and nutritious diet along with *Brihana Chikitsa*. *Ashta Ahar Vidhi Visheshha Ayatan* is also an important factor to prevent child from malnourishment.

Declaration by Authors

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