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,
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 population. 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. 1A 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 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 interchangeable. It is estimated that undernutrition throughout childhood accounts for 45% of all fatalities in children below 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.

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.

Kwashiorkor- it is usually affecting children aged 1-4 year. The main sign is pitting edema, the child may have a fat 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 simples’ stomatitis also be seen in Kwashiorkor. Marasmic 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.

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.
• 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.

CLASSIFICATION

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>
<thead>
<tr>
<th>Nutritional Status</th>
<th>Body weight as % standard for age</th>
<th>Edema</th>
<th>Deficit in weight for height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under weight</td>
<td>80-60</td>
<td>0</td>
<td>Minimal</td>
</tr>
<tr>
<td>Nutritional dwarfism</td>
<td>&lt; 60</td>
<td>0</td>
<td>Minimal</td>
</tr>
<tr>
<td>Marasmus</td>
<td>&lt; 60</td>
<td>0</td>
<td>++</td>
</tr>
<tr>
<td>Kwashiorkor</td>
<td>80-60</td>
<td>+/+</td>
<td>+++</td>
</tr>
<tr>
<td>Marasmus Kwashiorkor</td>
<td>&lt; 60</td>
<td>+</td>
<td>++</td>
</tr>
</tbody>
</table>

Table 1. WHO classification

Table 2. IAP Classification

<table>
<thead>
<tr>
<th>Nutritional Grade</th>
<th>% of standard weight for age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>Grade 1</td>
<td>71-80%</td>
</tr>
<tr>
<td>Grade 2</td>
<td>61-70%</td>
</tr>
<tr>
<td>Grade 3</td>
<td>51-60%</td>
</tr>
<tr>
<td>Grade 4</td>
<td>&lt; 50 %</td>
</tr>
</tbody>
</table>

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.

Bala: Various Acharyas hold slightly different opinions about the top bound of Balyaavastha. 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: Shosa, 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 dhatus will also be affected.

A) NIDANA (ETIOLOGY)
1. Atiswapna (sleeping too much)
2. Ati-Ambu sevena (overindulgence in water)
3. Ati-shitambhu sevena, or consuming too much cold water or liquid
4. Shlaishmik Stanya Sevana

- **Atiswapna**: 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 Dosha as well as Kshaya of Rasa Dhatu and further Dhatu. This Balashosha exhibit the clinical features of Rasa Kshaya like Aruchi (anorexia), Pratishyaya (coryza), Jwara
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. **Srotasdusthi:** 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 Dhatus'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. **Bringhana 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 Dhatus. Various Ayurveda preparations like Sishushosha Nasaka Ghrita, Ashwagandhadi Ghrita, Suvarna Yoga like combination of Suvarna Bhasma with Goghrita, Vacha & Kushta 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, Priyayal Modaka, Bajara Modaka, Tiladi Yoga, Shatavari Churna, Vidarikandadi Yoga etc are best Bringhana Dravya enumerated in Ayurveda Textbooks.

4. **Abhyanga- Abhyanga** with medicated oils like Soshamashaka Tail, Lakshadi Tail 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 Visheshtana'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 Upyogasamstha 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 Visheshtayana improves the availability of nutrients.

**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 years. 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 Balasosha. 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 Chikitasa 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.

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 break down of its Samprapti (pathogenesis) then correction of Agni by Agnideepana Chikitasa. Then start good and nutritious diet along with Brihana Chikitasa. Ashta Ahar Vidhi Vishesha Ayatan is also an important factor to prevent child from malnourishment.

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