

Review Article

# A Scientific Review on Kuposhanajaya Vikara W.S.R. to Protein Energy Malnutrition and its Treatment in Children

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## I N F O

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## A B S T R A C T

The preservation of children's health is the prime duty of humanity. In every country, children constitute a priority group. Current Indian population according to a survey is 1.21 billion. (2011 census) and about 37.3% of total populations are children. Among which 158.8 million children are of 0-6 year's age group (13.12 % of Indian population). The health status of adult population is a continuation of health status of children in terms of Growth, Nutrition and Development. Health of a child is a growing concern all over, with rapid economic growth and social changes both in developed and developing parts of the world. Therefore, vital importance towards these children is felt in need.

Malnutrition mainly arises from inadequate diet and frequent infection, leading to insufficient intake of calories, protein, vitamins and minerals. Malnourished children suffer more frequent and severe infectious illnesses; furthermore, even mild under-nutrition increases a child's risk of morbidity and mortality. Chronic under-nutrition in children can also lead to long-term developmental problems. Ahara Dosha is the main predisposing factor of this disorder and Alpasana and Vishamasana (false habits of intake) especially results in the development of Karshya.

Meaning of Balasosha is "Emaciation of child". According to Ayurveda it originates from nutritional deficiency in children, which is called as protein energy malnutrition. Although exact correlation of Balasosha with any specific disease of modern medicine is not possible but keeping in view the various clinical signs and symptoms of P.E.M., it can be equated with karshaya, phakka roga, parigarbhika, to some extent.

**Keywords:** Balasosha, PEM, Kuposhana, Phakka Roga

## Introduction

Malnutrition is a condition when the body does not get Adequate Nutrition). Malnutrition in the broad sense can

mean over-nutrition or under-nutrition but PEM (Protein energy malnutrition) is restricted to under-nutrition. Nutritional status is an indicator of nutritional profile of

entire community. Under-nutrition is widely recognized as a major health problem in the developing country of world.<sup>1</sup> A recent survey by HUNGaMA (Hunger and Malnutrition) report said that underfive, who are underweight are unacceptably high at 42%. PEM affects every 4th child worldwide. It has been estimated that in India, 47% children suffer from varying degrees of malnutrition.<sup>2</sup>

Malnutrition, forms a worldwide perspective, is one of the leading cause of morbidity and mortality in childhood. Malnutrition is a silent killer disease. About 50% of all childhood deaths are attributed to malnutrition. Malnutrition is still the first killer disease (54%) followed by acute respiratory infection (20%) and diarrhea (18%) in global perspective. Malnutrition kills 5 million children every year.<sup>3</sup>

*“Upshoshita alpa rasa dhatujanya mamsahani sareeram mamsakshayo va”<sup>4</sup>*

A condition or disease in which the body of a person becomes emaciated, having less quantity of Rasa Dhatu causing further a status of Mamsahinata or Mamsakshaya.

*“Sareeropachayetyadi upachayah sthoulyam, apachayah karshya”<sup>5</sup>*

Dalhana in his commentary says in Karshya, Dhatukshya is the main event and thus this falls Karshya under Apararpanajanya diseases.

Kupashana causes “Emaciation of child” which originates from nutritional deficiency in children, which is same as Protein Energy Malnutrition (PEM) in modern science in relation to cause, signs and symptoms and treatment. Exact correlation of Kuposhana with any specific disease of modern medicine is not possible but various clinical signs and symptoms are exactly same as that of PEM.

## Aims and Objective

The main aim of this present article is to study the detail knowledge regarding:

- Kuposhana Janya Vikara
- Malnutrition disorders
- Comparison between Kuposhana Janya Vikara and malnutrition
- Treatment according to Ayurveda

## Materials and Methods

This review was done by compiling the classical Ayurveda books, modern pediatric books, magazines, research articles, thesis and dissertations Pubmed and different databases.

## Probable Comparisons of Some Karshya Related Diseases in Children

Ayurveda has mentioned Karshya in numerous contexts where it has been explained as a clinical feature of a disease or as a complication of certain conditions. Most

of the diseases which are of acute nature cause Karshyata in children due to their less intolerance to diseases. As we look into the presentation of the said conditions, it is evident that these are symptoms of severe malnutrition and consequences of it. The possible correlations of certain conditions that can be critically understood are discussed next.

## Karshya as Underweight

According to Ayurveda Karshya is a condition where a child who is having a stable agni, good appetite and taking feeds properly but has weakness of the body and does not gain weight appropriately. Dalhana explains that a person having a lean and thin body but does not have any other complaints is called Krisha. Krishata can be correlated with underweight in children. Malnutrition is a composite form of under-nutrition that includes elements of stunting and wasting and is defined as weight for age below minus two standard deviations from the median weight for age of the standard reference population. Mild to moderate malnutrition is the most common nutritional problem in protein energy malnutrition. A child who is malnourished but does not have any feature of marasmus and kwashiorkor and his weight for age is 60- 80% is called as underweight. Growth failure is manifested by slowing or cessation of linear growth, static or decline in weight, decrease in mid arm circumference, delayed bone maturation, normal or diminished weight for height and normal or diminished skin fold thickness.

## Phakka as Protein Energy Malnutrition

Phakka is a disease explained by Acharya Kasyapa where along with nutritional deficiency there is motor and mental developmental delay in the child. Three types of phakka are explained: Garbhaja, Ksheeraja and Vyadhija. Garbhaja phakka, is caused when the nutritive value of the mother’s breast milk reduces (due to a second pregnancy or under-nutrition of the mother herself) and the child is early weaned from the breast causing dhatukshaya i.e, emaciation, and arrests normal growth and development of the child. The disease advances to such a stage that the child is crippled due to malnutrition. This condition can be paralleled with kwashiokar by its cause and features.

Paribhava” means to humiliate or disrespect and “Parigarbhika” means ‘humiliation by garbha’ indicating due to next pregnancy. According to Vagbhata Parigarbhika, is a disease in which the child becomes emaciated because of non-availability of breast milk because of a second growing fetus. The vitiated breast milk diminishes agni causing Dhatu, Dushti, and vitiation of Kapha with features such as anorexia, vomiting, abdominal distension, emaciation and drowsiness. The causes of Parigarbhika are quite similar with the causes of kwashiorkor.

The features of Kwashiorkor are anorexia, edema, irritability

ulcerating dermatoses, and enlargement of liver. Breast milk present in proteins and amino acids required for child's growth. Kwashiorkor may develop after a mother stops feeding the baby with her milk, and replaces it with a carbohydrates-rich diet, especially sugar, but deficient in protein. According to Prof. Cicely Williams this (kwashiorkor) was the disease of first child when second was on the way displacing the first child from the breast.

Ksheeraja Phakka is caused due to vitiation of the Kapha Dosha in breast milk which diminishes Agni, and leads to Avrodha of the Rasavaha Srotas causing emaciation, weak resulting in motor function insufficiencies. Tridosha vitiated Ksheera results in lameness, mental retardation and speech delay in the baby. Qualitative and quantitative reduction in the milk of the mother causes Ksheeraja Phakka which is comparable to the cause of protein energy malnutrition.

### Vyadhija Phakka & Kumarasosha as Marasmic-Kwashiokar

In Vyadhija Phakka, the child who is abandoned ends up malnutrition with features such as emaciated hips and arms, decrease in muscle, strength and luster, protuberant abdomen, prominent bony protuberances, crawls on hands and knees due to inability to stand and walk, passes too much urine and stool, dry hairs, long nails, foul smell, irritable and thick nasal discharge. Marasmic kwashiokar is a condition with features of both marasmus and kwashiokar simultaneously. The body weight is less than 60% of the normal and dependent edema is present with mental changes, skin and hair changes along with hepatomegaly. Due to defective immunity, intestinal flora is altered and accounts for diarrhea; all of which are seen in Vyadhija Phakka as well.

Kumarashosa is a similar condition seen in a child who indulges in excessive day sleep, drinks cold water and Kaphaja Stanya repeatedly. Although the causes of the disease do not coincide, clinical presentations intersect. Features of Kumarasosa are anorexia, rhinitis, fever, cough, emaciation and slimy pale appearance of face and eyes. Chakradatta calls this condition as Ahitundika/ Ahindika.<sup>6</sup>

### Sushkarevati Graham as Failure to Thrive

Emaciation is the characteristic feature of Sushkarevati graha. The child becomes Krish even though he consuming appropriate food, child suffers from severe thirst shriveled eyes, falling of hairs, aversion to food and feebleness of voice. Further manifestations of systemic symptoms such as nodules around the abdomen and foul smell of body and feces are explained.<sup>7</sup> Failure To Thrive (FTT), more recently known as faltering weight or weight faltering is a term used to indicate insufficient weight gain or inappropriate weight loss. It covers poor physical growth of any cause and does not itself imply abnormal intellectual, social, or emotional

development, although it can subsequently be a cause of such pathologies.<sup>8</sup> Features of Sushkarevati corresponds to FTT caused either due to organic or inorganic causes.

### Atikarshya as Marasmus

The clinical features of Atikarshya are emaciation of the buttocks, abdomen and neck, prominent visible veins and prominent joints with only skin and bones remaining. Symptoms of marasmus are wasted appearance, loss of muscle mass and subcutaneous fat, hypothermia, hyperthermia, anemia, dehydration, abdominal, ocular and dermal manifestations.<sup>9</sup> Marasmus-affected children exhibit extreme wasting and has an old man appearance with just skin and bones.

### Symptoms Grading

Atikarshya	Marasmus
Wasting of thigh and buttock-Grade I	Wasting of groin axilla-Grade I
Wasting of Abdomen Grade-II	Wasting of thigh & buttock-Grade II
Wasting of neck Grade-III	Wasting of chest & abdomen-Grade III
	Wasting of buccal pad of fat-Grade IV

### Andhapootana as Vitamin a Deficiency (Caused Due to Diarrhea)

Vomiting, fever, cough, diarrhea, emaciation, eye disorders (dryness, dimness of vision and inflammation), aversion to breast milk, discoloration of skin, shrilled cry and bad fishy odour of body are characteristic features of Andhapootana graham. Features suggestive of severe dehydration which leads to non absorption of vitamins from the gut causing deficiencies especially Vitamin A deficiency (VAD) can be correlated here. Extreme irritability or sleepiness in infants and children, very dry mouth, skin and mucous membranes, little or no urination and tears, sunken eyes, shriveled and dry skin and fever are seen in dehydration. Eye related disorders like night blindness, xerophthalmia and various degrees of vision loss are associated to VAD.

### Classification<sup>10</sup>

Protein energy malnutrition is a generalized syndrome complex, and it is very difficult to classify it by using a single parameter. A large number of classifications have been proposed:

- Clinical Classification
- Anthropometrical Classification

**Clinical Classification:** Clinical classification is based on relative contribution of protein or energy deficit.

1. Kwashiorkor: Results from gross deficiency of proteins with an associated energy inadequacy.
2. Marasmus: Is the result of gross deficiency of energy, though protein deficiency also accompanies.
3. Marasmic Kwashiorkor: Overlap of clinical picture of Kwashiorkor and a Marasmus.
4. Pre- Kwashiorkor: Affected children have poor nutritional status and certain features of Kwashiorkor but do not have oedema.
5. Underweight: The child is malnourished, but does not have any feature of marasmus or kwashiorkor. The weight for age is 60-80% of the expected.

**Anthropometrical classification:** There are many classifications based on anthropometrical measurements. PEM is generally classified according to weight for age. Chronic malnutrition is classified according to height for age and acute malnutrition is classified according to weight for height. Classification according to weight for age: weight for age is the most commonly used parameter to classify nutritional status.

1. Gomez's classification: It was the first classification of PEM which came in 1956.
  - Grade I - 90 - 75% of expected weight (Harvard standard)
  - Grade II - 75 - 60% of expected weight
  - Grade III - < 60% of expected weight
2. D.B. Jelliffe's classification
  - Grade I – 81: 90% of expected weight (Harvard standard)
  - Grade II – 71: 80% of expected weight
  - Grade III – 61: 70% of expected weight
  - Grade IV: < 61% of expected weight
3. Wellcome or International Classification
  - Weight between 80 and 60% of expected for age
  - With edema kwashiorkor
  - Without edema under-nutrition
  - Weight below 60% of expected
  - With edema marasmic kwashiorkor
  - Without edema nutritional marasmus
4. Indian Academy of pediatrics classification
  - Grade I: 70 -80% of expected weight
  - Grade II: 60 -70% of expected weight
  - Grade III: 50 -60% of expected weight
  - Grade IV: <50% of expected weight

## Treatment

### Chikitsa

Karshya is a Vata Pradhana Vyadhi, mainly occurring due to dhatukshaaya so vata upakrama mentioned in ayurvedic samhitas can be adopted. Brimhana therapy is very beneficial as it results in Dhatu Poshana.

The management of karshya should be in following manner:

- Nidana parivarjana
- Samshamana
- Samshodhana
- Ahara
- Vihara

### Nidana Parivarjana<sup>11</sup>

Nidana Parivarjana means avoiding the cause, it has two benefits - as a prophylactic measure and further progression of disease will be halted.

### Agni Deepana<sup>12</sup>

First line of Samshamana Chikitsa is to improve the proper functioning of Agni through the Aushadhis, and by following Pathya.

### Pachana<sup>13</sup>

In Samprapti of Karshya it is observed that the Ama has important role in the manifestation of the disease. So to treat Karshya, the prerequisite is to adopt Ama Pachana Chikitsa. After giving the Deepana Dravyas next Pachana Dravyas like Shunti can be administered.

### Samshamana<sup>15</sup>

Shamana therapy is conservative treatment. It is means treatment by drugs according to severity of disease as well as the condition of diseased.

### Samshodhana

Karshya is an apatarpana janya vyadhi. Hence Brimhana therapy is indicated here. But mridu Samshodhana can be advised to the Krisha patient.4 Samshodhana therapy is of two types:

- Bahir Parimarjana
- Antaha Parimarjana<sup>16</sup>

### Rasayana and Vajeekarana<sup>17</sup>

Rasayana, Vajeekarana, Balya, Jeevaniya and Brimhaniya, drugs should be used which leads to dhatu poshana.

### Pathyapathya

#### Ahara<sup>18</sup>

Different dietetic and nutritional regimens are employed for the management of Karshya. like Mamsa, Dugda, Ghrita, Shashtika Shali, Godhuma, Masha , all these ultimately lead to Dhatu Poshana.

#### Vihara<sup>19</sup>

This includes various preventive as well as rehabilitative measures effective for both Manas and Shareera like Ati swapna, feeling joy, sukha shaiyya complete mental relaxation, physical exercise and meeting friendly people and pleasant sight, Abhyanga, Snigdha Udvartana, Snigdha

Snana, use of Shukla Vastras, freedom from anxiety and adequate sleep, etc result in Dhatu Poshana.

In the context of Karshya Nidanas, various Viharas which are stated as causative factors for Karshya Vyadhi, those viharas are Apathya to the Rogi and those should be avoided during the course of treatment.

### Discussion

We can say that Kuposhana Janya Vikara are growth and developmental deficiency. It can be co-related with protein energy malnutrition, marasmus, rickets, or chronic malabsorption conditions. Most of the characters are correlating with marasmic child.

Kshiraja and Garbhaja Phakka can be compared with acute malnutrition and Vyadhija Phakka with chronic malnutrition. In Phakka, Roga Agnimandya leads to Stanya-Abhava as well as to improper formation of Dhatus so treatment should be aimed at Prakrita Dhatu Poshana. So the way of treatment should be Deepan and Pachana to improve the digestion and metabolism to strengthen the Rasa Dhatu and other Dhatu.

In Kshiraja Phakka, Shodhana Upakrama administered to the dhatri having kaphaj stanya dushti, few tikshna Shodhanvama Dravya we use Vacha, Sarshapa, Pippalidravya. After Vamana Sansarjanakarma should be followed and for Shaman internally; in addition, Nasya, Dhum, Gandush, Pradeha, and Parisheka are also indicated.

In Vyadhij Phakka, a main cause is Doshdushyasamprapti due to the Nija Roga and Agantuj Roga.

For Vyadhija Phakka, the treatment should be swalp-aahara (proper quantity of nutritious food). For Agnideepana, various Ilhyadravya and Kalpas described by Kashyapa should be internally given .

So we can conclude that kuposhanajanya vikaras and malnutrition disorder are same group of diseases explained in different eras as they possesses mostly same causes, pathology signs and symptoms and treatment.

**Conflicts of Interest:** None

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