REVIEW ON **KARSHYA** (NUTRITIONAL DISORDER IN AYURVEDA) AND MALNUTRITION

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ABSTRACT

Ayurveda is mainly based on preventive aspect first rather than curative. Aahara (Food) is considered as the first pillar among three Nidra and Abrahmacharya being other two. Many common health problems can be prevented through nutritious diet. Food is important as a nutritional source, also with therapeutic value and most importantly it plays a vital role during the post treatment period in re-gaining the diminished strength due to the harmful effect of the disease. Nutritional disorders are described in scattered manner in Ayurveda texts. Childhood undernutrition is an underlying cause in an estimated 35% of all deaths among children under five and 21% of total global disability adjusted life years lost among less than 5 children. Karshya is disease a similar to undernutrition. Similarly, disease such as Parigarbhika, Phakka, Balashosha, and Shuska Revati describe by various author of Ayurveda can also co-related to Undernutrition based on the clinical features these diseases related to each other. This article highlights the Ayurvedic view of nutritional disorder like protein energy malnutrition.

**KEYWORDS:** Nutrition, Karshya, Undernutrition, Protein energy malnutrition.

INTRODUCTION

Undernutrition 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 Overnutrition. However, sometimes malnutrition and protein energy malnutrition (PEM) are used interchangeably with undernutrition¹. Growing children are most vulnerable to its consequences. Their nutritional status is a sensitive indicator of community health and nutrition².

Food (Aahara) is one of the three sub-pillars of life as per Ayurvedic classics³. Indian traditional medicine has incorporated various explanations regarding this vital pillar of life. The transforming unit from 'food' into nutrition is termed as 'Agni' or digestive fire, which forms the edifice upon which the Ayurvedic system is built⁴. According to Acharya Charaka over lean
persons are described under eight despicable persons (Ashtau-ninditiya Purusha) along with over obese (Medasvi) person\textsuperscript{[5]}. 

In the field of pediatrics there are so many disease which have no or limited answers in the contemporary medical science. Growth and development is a physiological process provided all factors influencing them are healthy. Failure to thrive or small for age are resulting when these factors are deficient, and in Ayurveda it is addressed as Karshya.

**Epidemiology:** Childhood undernutrition is an underlying cause in an estimated 35% of all deaths among children under five and 21% of total global disability adjusted life years lost among less than 5 children. According to National Family Health Survey (NFHS) 3, carried out in 2005-06, 40% of India’s children under the age of three are underweight, 45% are stunted and 23% are wasted\textsuperscript{[6]}. Almost 11 million children will die before they reach the age of five; four million of them in the first month of life. In India, almost one out of every 2 children goes to bed on an empty stomach\textsuperscript{[7]}. Both girls and boys have similar prevalence of undernutrition. Prevalence of undernutrition is higher in rural areas (46%) than in urban population (33%). During the first six months of life, 20-30% of children are already malnourished, often because they were born low birthweight. The proportion of undernutrition starts rising after 4-6 months of age because of the introduction of unhygienic food intake, which leads to increase in predisposition to undernutrition\textsuperscript{[8]}.

**Nidana of Karshya (Etiological factor):** Rukshanna pana sevana (Indulgence in rough food and drinks), Langhana (Fasting), Pramitashana (Little diet), Kriyatiyoga (Excessive subjection to evacuative therapy), Shoka (Grief), Chinta (Worries), Bhaya (fear), Shrampa (excessive physical and mental activity), Vega- Nidra-Trusha –Kshudha - nigraha (Suppression of natural urges, such as - sleep thirst and hunger), Atishrama, Ati maithuna, Atisnana abhyasa (Excessive exercise, sexual intercourse, excess bath), Ruksa udvartan (Excess non - unctuous anointing to the persons), Snana abhyasa ( Indulgence in bath), Prakruti (Constitution), Beeja Dosha (heredity), Jara (Old age),Vikar-anushaya (Continued disorder) and Krodha ( Anger) make a person lean\textsuperscript{[9]}. The lean person does not tolerate physical exercise, over –saturation, hunger, thirst, disease, and drugs and also too much cold, heat and sexual intercourse\textsuperscript{[10]}.

**Signs and symptoms of Karshya:** The lean person has Shushka-sphic, udar, greeva (Dried up buttocks, abdomen, neck), Dhamanijala santataha (Prominent vascular network) Twagasti shesho, Ati krusha (Remnant of skin and bone), Sthoola parva ( Thick joints ), Vyayam Atisauhityam (The over lean does not tolerate physical exercise, over saturation),
Kshutpipasamay-aushadham (dose not tolerate high in toxicity of hunger, thirst, disease, drugs), Ati-shitoshna-maithunam (Too much of cold, heat and sexual intercourse)\textsuperscript{[11]}.

**Samprapti (Pathogenesis of disease):** Those who indulge in Vata promoting diet, physical exercise, excessive sexual intercourse, strenuous study, anxiety, wakefulness in night, thirst, hunger, taking of astringents, partial starvation etc., circulating Rasa being reduced in quantity fail to nourish the tissue due to insufficiency; hence extreme Karshya (leanness/emaciation) occurs\textsuperscript{[12]}.

**Diagrammatic presentation of Karshya Samprapti:**

Receive etiological factor diet and physical work

\textit{(Nidana Sevana – Vata vardhaka Aahara-Vihara)}

\begin{itemize}
  \item Vitiation of Vata \rightarrow Agni Dusti \rightarrow Formation of Ama
  \item \hspace{1cm}Dhatu Kshaya
  \item \hspace{1cm}Inadequate Rasa Dhatu and improper absorption due to formation of Sama ahara
  \item \hspace{1cm}Shoshita Rasadhatu
    \begin{itemize}
      \item (Fail to nourish tissue due to insufficiency)
      \item \hspace{1cm}Under nourish Rasadhatu (Shushka) circulate in whole body
      \item \hspace{1cm}All Dhatu or tissue not gets nourishment due to Alpa Shushka Rasadhatu
      \item \hspace{1cm}Karshya
    \end{itemize}
\end{itemize}


**Complication o Karshya disease:** The lean person becomes a victim of spleen (enlargement), cough, wasting, dyspnea, gaseous tumour, piles, abdominal disease, and the disease of Ghrahani (Gastro-intestinal track)\textsuperscript{[13]}.

**Failure to thrive:** Failure to thrive (FTT) is a descriptive term rather than diagnosis and is used for infants and children up to five years of age whose physical growth is significant less than
their peers same age and sex. Failure to thrive usually refers to weight below 3rd or 5th centile, failure to gain weight of time or a change in rate of growth that has crossed two major centile, e.g. 75th to 50th, over a period of time. The children present with poor growth, often associated with poor development and cognitive functioning. The degree of Failure to thrive (FTT) is usually measured by calculating weight, height and weight-for-height as percentage of the median value for based on appropriate growth chart[14].

Protein Energy Malnutrition (PEM): The World Health Organization (WHO) defines PEM as range of pathological condition arising from coincidental lack in varying proportion of protein and calories, occurring most frequent in infants and young children, and commonly associated with infection[15].

IAP classification of malnutrition: This classification is based on weight for age values[16].

<table>
<thead>
<tr>
<th>Grade of malnutrition</th>
<th>Weight-for-age of standard (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&gt; 80</td>
</tr>
<tr>
<td>Grade 1</td>
<td>71-80 (mild malnutrition)</td>
</tr>
<tr>
<td>Grade 2</td>
<td>61-70 (moderate malnutrition)</td>
</tr>
<tr>
<td>Grade 3</td>
<td>51-60 (severe malnutrition)</td>
</tr>
<tr>
<td>Grade 4</td>
<td>&lt; 50 (very severe malnutrition)</td>
</tr>
</tbody>
</table>

Moderate to severe malnutrition is associated with one of the classical syndrome, namely, Marasmus, Kwashiorkar, and Marasmic-Kwashiorkar[17].

Marasmus: It is characterized by marked wasting of fat and muscle as these are consumed to make energy. The main sign is severe wasting the child appears very thin (skin and bones) and has no fat. There is severe wasting of shoulder, buttocks and thighs. The loss of buccal pad of fat creates the aged or wrinkled appearances that have been referred to as monkey faces. Baggy pants appearances refer to loose skin of the buttocks hanging down. Axillary pad of fat may also be diminished, Affected children may to alert in spite of their condition. There is no edema.

Kwashiorkar: It usually affects children aged 1-4 years. The main sign is pitting edema. Child may have a fat sugar baby appearance. Edema ranges from mild to gross and may represent upto 5-20% of the body weight. Muscles wasting always present and child unable to stand or walk. The skin lesion consists of increased pigmentation, desquamation and dyspigmentation may confluent resembling flaky paint or in individual enamel spots. Petechiae may be seen over abdomen. Smooth tongue, cheilosis and angular stomatitis, Herpes simplex stomatitis also be seen in kwashiorkar. A flag sing which are the alternate bands of hypopigmented and normally pigmented hair pattern is seen when the growth of child occurs in spurts. Hairs lose their luster
and are easily plunkable. Mental changes include unhappiness, apathy or irritability with sad, intermittent cry. Neurological changes seen during recovery. Anorxia, vomiting, abdominal distention, and stool may watery or semisolid, bulky with low pH and may contain unabsorbed sugars. Anemia present as in mild PEM but with greater severity. Prolong circulating time, bradycardia, diminished cardiac output and hypotension is seen in kwashiorkar. Glomerular filtration and renal plasma low are diminished.

**Marasmus-Kwashiorkar:** It is a mixed form of PEM and manifests as edema occurring in children who may or may not have others signs of kwashiorkar and have varied manifestation of marasmus.

In different samhita of Ayurveda following diseases described that is near to malnutrition.

**Balashosha and Kshiraja Phakka:** Balashosha and Kshiraja Phakka are nutritional deficiency disorder mentioned by two different authors. The cause of Balashosha is Shlaishmika anna sevana (Excessive energy dense food), Shitambupana (drinking cold water) and Diva swapna (excessive day sleep), drinking breast milk vitiatted by Slesma-by these he channel of Rasa (first fluid liquid) gets block by Kapha. Clinical features are Arochaka (Reduced digestive capacity) Pratishaya (running nose) Jwara (fever) and Kasa (cough), these condition if not detected early may lead to Shosha (emaciation) with its eyes being unctuous (grassy) and white[18, 19]. In the Kshiraja Phakka, wet nurse having breast milk vitiatted by Kapha is knows as having Phakka causing milk. The child consuming milk suffers from so many disease thus, due to emaciation attains state of Phakka (marasmic state)[20].

**Parigarbhika / Garbhaja Phakka:** Child on feeding breast milk of pregnant mother which has Alpa Poshaknsha (poor nutrients) leads to Parigarbhika[21]. Garbhaja Phakka condition presents with the child whose mother has becomes pregnant, due to early cessation breast milk child becomes emaciated or even dies, this marasmus is due to effect of embryo/fetus[22].

**Vyadhi Sambhavaja Phakka:** Vyadhija Phakka is malnutrition condition resultant of chronic disease. On the whole Vyadhija Phakka refers to severe forms of malnutrition, child suffers from fever, endogenous and exogenous disease, his flesh, strength and luster decrease, Shuska Sphik and Shuska Bahu (wasting of buttocks and wasting of upper limb), Shuska uru (Wasting of thigh), Mahadara (abdomen becomes protuberant), Mahoshiara (comparatively skull, the face becomes more dominant),duet to relatively wasting in body parts, yellow eye, horripilation in body part, appears just like a skeleton, Nischeshta Adho Kaya (lower body part is emaciated, weak), passes daily to much passes and urine, lower body becomes inactive or crawls with hand
and knee, due to weakness has less activity and due to less activity is overpower by flies, insects and worm, thus due to disease reaches nearer to death. This marasmic has dry, erect and stiff body-hair, big nails, foul smell, dirty, irritable, dyspneic, feels if entering dark, passing excessive feces, urine, abnormal thick nasal discharge\[23\].

**Shuska Revati:** Shuska Revati one Graha (demon) affecting the child represents infections spectrum of disease resulting Sarvangakshya (emaciation). Child becomes emaciated even though consuming food of many kinds suffers from severe thirst and shriveled eyes. When child presents with falling of the hair, Annadwesha (aversion to food), feeble voice Vivarnata (discoloration/loss of lusters), Nanavidhashakrita (variegated colour stool), Udara granthi (abdominal nodular swelling), depression in the middle of the tongue and the palate becomes black\[24\]. Child shows progressive emaciation at the outset the clinical condition which can be with abdominal tuberculosis.

**Recommendation for prevention of Malnutrition**\[25\]

1. Mothers should be advised to initiate breast feeding within one hour of delivery.
2. Importance of exclusive breast feeding for the first 6 months of baby’s life and proper weaning thereafter should be properly explained to mother.
3. Nutritional education has to be imparted to the people regarding consumption of cost-effective nutritious diet.
4. Special efforts have to be made to improve acceptance of family planning methods for limiting the family and to give adequate spacing between children.
5. Environmental sanitation has to be promoted in reducing infection and breaking the vicious cycle of infection leading to under nutrition.
6. Socio-economic development among the rural masses needs to be ensured which is the important factor to tackle malnutrition, mainly undernutrition.
7. Government should allot more money in health sector for integrated health packages and should ensure proper functioning of health programs.

**Current Guidelines for prevention of Malnutrition**

Care of nutritional needs is required at three stages; Nutrition during pregnancy, nutrition in infancy and nutrition in childhood. Fetal nutrition is totally dependent on maternal nutrition. In fact, intra uterine growth retardation (IUGR) may be due to maternal deprivation and or diseases in pregnancy. Infant nutrition should be through exclusive breast feeding up to 6 months, to meet the nutritional demands and to prevent morbidity. Following period is complemented with other foods along with breast feeding to meet the growing needs of the infant. Diet in children needs
equal emphasis on both quality and quantity. Toddler needs more than half the portion of food that mother eats. The diet of pre-school children needs special attention to vitamins and minerals varieties; while school going children need 3/4th of food that father eats. Children should not miss meals, especially breakfast\textsuperscript{[26]}.

**DISCUSSION**

*Karshya* is nutritional disorder described in Ayurveda samhita and it is possible related to undernutrition. 35% of all deaths among children under five and 21% of total global disability adjusted life years lost among less than 5 children. According to Acharya Charaka *Ati Karshya* persons are described under *Ashtauninditiya* (eight despicable persons) along with over obese (*Ati Sthula*) person. An over lean person has Shushka-sphic, Udar, Greeva (dried up buttocks, abdomen, neck), Dhamanijala santataha (prominent vascular network), Twagasthi Shesho, *Ati Krusha* (remnant of skin and bone) and *Sthool Parva* (thick joints). In Ayurveda no much description is found regarding *Karshya* especially in Children. According to Acharya Kashyapa described *Vyadhi Sambhavaja Phakka* and it is similar to malnutrition. *Balashosha* and *Kshiraja Phakka* are nutritional deficiency disorder mentioned by Acharya Vaghbata and Acharya Kashyapa respectively. Similarly, *Parigarbhika* and *Garbhaja Phakka* are caused by child on feeding breast milk of pregnant mother which has *Alpa Poshakansha* (poor nutrients). *Shuska Revati* one Graha (demon) affecting the child represents infections spectrum of disease resulting *Sarvanga Kshaya* (emaciation) and child becomes emaciated even though consuming food of many kinds. All the disease described in Ayurveda texts is related to each other and possible to correlate to malnutrition like protein energy malnutrition (PEM). *Dosha* like *Alpashana* and *Vishamashana*; *Vihara Dosha* like *Atishrama* and *Manasika Bhava* like *Shoka*, *Bhaya*, *Krodha* are the main etiological factors for *Karshya*. *Karshya* is including whole of diseases which are undertaken malnutrition. Now-a-days malnutrition is classified according to weight, BMI, etc. *Karshya* can be a *Swatantra Vyadhi* and it also can be as a symptom or complication of other diseases. The *Samprapti of Karshya* is like this: *Nidana Sevana* → *Vata prakopa*→ *Shoshita Rasadhatu* → All *Dhatu Utpati Alpa* → *Karshya Utpati*. The Disease is assessed by Dietary History, Subjective Parameters – clinical signs, anthropometry and Hematological and Biochemical Investigations. *Karshya* is an *Apatarpana Janya Vyadhi* So; its management is done by *Santarpana –Brumhana*. World Health Organization (WHO) has described malnutrition as a “global problem”, having adverse effects on the survival health performance and progress of population groups. The effects are of the highest order in the developing countries. Care of nutritional needs is required at three stages; Nutrition during pregnancy, nutrition in infancy and
nutrition in childhood. Fetal nutrition is totally dependent on maternal nutrition. The most significant in the preventive measures for this disease is “nutrition education” which including good antenatal care, encouragement to the mothers to breastfeed the infants, complementary feeding, supplements should be combination of cereals, protein rich foods and fruits, National Nutrition Programs etc.

CONCLUSION

Malnutrition is describe in modern medical sciences but is similar to nutritional disorder in Ayurveda like Karshya, Phakka and Balshosha. A systemic study of these conditions provide insight in to hazards of nutritional deficiency and represents different aspects of nutritional deficiency and proper understanding of pathogenesis of condition provide valuable key for the effective management.

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