



Review Article

AN INTEGRATED APPROACH ON CHILD NUTRITION

REENA KULKARNI

Associate Professor, SDM College of Ayurveda, Hassan

Email: drreenakulkarni@gmail.com

Access this article online : www.jahm.in

Received on: 22/04/2013, Revised on: 02/05/2013, Accepted on: 12/05/2013

Abstract

Nutrition is one of the most important and highly discussed topics in medical community. It determines the quality of health in young citizens as well as the future of the nation. Infant and child nutrition, especially in the first few years of life is crucial; lest ends up in malnutrition. Policies on nutrition and health education of mothers on infant and young child feeding as well as efforts to trigger appropriate behavioural changes among mothers are being considered as direct interventions for reducing malnutrition in children. India evidences major concern regarding child malnutrition despite enormous efforts. Proper knowledge of nutrition blended with traditional and scientific value will enhance better adaptation and community participation, hence to aid in improving nutritional status. Ayurveda emphasizes good nutrition at every stage of life, season as well as daily routine, in order to preserve health of mother and offspring. Nutritional aspects of Ayurveda, care of pregnant lady, infant nutrition, breast feeding, complementary foods and proper weaning; with due applied aspects; and current guidelines are the highlights of this write up.

Key Words

Ayurveda, Nutrition, Ahara, fetal nutrition, infant nutrition, Shishu prashana, Ayushman Kumara Lakshana

INTRODUCTION

Nutrition serves as the corner stone for child survival and quality of survival. It influences the growth, development and immunity. Optimal infant and young child feeding practices rank among the most effective interventions to improve child health. An estimated 9.5 million children die before their fifth birthday, and two thirds of these deaths occurred in the first year of life. Under-nutrition is associated with at least 35% of child deaths.¹ It is also a major factor preventing children from reaching their full developmental potential. Around 32% of children, less than 5 years of age in developing countries are stunted and 10% are wasted.² Indian academy of pediatrics states that among under 5 children, 44% are stunted and 15% are wasted in Asia.³ It is

estimated that sub-optimal breastfeeding, especially non-exclusive breastfeeding in the first 6 months of life, results in 1.4 million deaths and 10% of the disease burden in children younger than 5 years.⁴ Further, If complementary foods are not introduced when a child has completed 6 months of age, or if they are given inappropriately, an infant's growth may falter.⁵ To improve this situation, encourage mothers and families and also to initiate and sustain appropriate infant and young child feeding practices, governing bodies are taking enormous initiative. Despite these efforts, the problems of malnutrition are never ending. This creates an urgent need to publicize more and more on this topic. Success in community always depends up on maximum utilization of community practices and traditional

recommendations rather than market strategy. Hence a dispersal of traditional knowledge based on Ayurveda in the current guidelines is essential.

Concept of Nutrition in Ayurveda

Nutrition of Garbha (fetus)

The very concept of nutrition in Ayurveda starts from the pre-conception stage, where in best quality reproductive tissue (*Retas* and *Artava*)⁶ are a must in order to obtain healthy progeny which will achieve optimum and uninterrupted growth after birth. Also, after conception, the care of pregnant lady mentioned in Ayurvedic classics predominantly deals with nutritional regimen in the best interest of the mother and fetus. During pregnancy, the fetus completely depends up on the mother for both its nutrition and excretion.⁷ The regimen during the first trimester which is predominantly milk and milk based foods, points to the fact that, although the physiological aversion to food persists during this period the lady should take minimum quantity balanced diet like milk.⁸

Processing of milk with Madhu (honey), Ghee, Navaneeta (butter)⁹ and herbs of the *Madhura Varga*¹⁰ during the first trimester is to enhance the bioavailability along with micronutrient fortification. The emphasis on green leafy vegetables during this phase aids in enriching the food with folic acid, minerals and vitamins.¹¹ Navaneeta and milk in 4th month⁴ is to target the development of *Hridaya* (CNS), with due consideration on *Sneha Samanyata* (contents rich in Poly unsaturated fatty acids which aid in brain development). Diet rich in pulses, meat products and regimen like *Basti* (medicated oil enema) with *Bala Taila* or *Madura Aushadha Siddha Sneha* during third trimester¹⁰ is to give a boost to the development of musculo-skeletal tissue in the growing fetus. Also, this helps in conditioning the mother's body for the process of labour as well as to

prevent some of the diseases that can affect fetal growth and nutrition (hypertensive disorders of pregnancy).¹² Apart from this, *Rasaja* and *Satmyaja Bhavas*¹³- epigenetic factors influencing growth and development, are given importance along with genetic and environmental influences (*Balavat purushe deshe kale janma*).¹⁴ Further, all these factors largely depend up the nutritional adaptation of the individual with due emphasis on *Ashta Vidha Ahara Ayatana* (the rules and regulations regarding the intake of food, its qualities and quantity).¹⁵

Infant Nutrition

In new born care once again, stress is laid upon nutrition. Breast milk is compared to nectar and described as an unparalleled food.¹⁶ Breast feeding is encouraged right from within few hours of delivery as soon as baby is stabilized.¹⁷ Breast milk is the sole food mentioned up till six months¹⁸ unless situation demands supplementary feeding or food. It is highlighted for its importance in brain boosting and disease prevention of both mother and baby.¹⁹ Reviews of studies from developing countries show that infants who are not breastfed are 6²¹ to 10 times²² more likely to die in the first months of life than infants who are breastfed. Predominant breastfeeding is associated with substantially lower risk of deaths compared with partial or no breastfeeding.²³⁻²⁴ Diarrhea²⁵ and pneumonia²⁶ are more common and more severe in children who are artificially fed, and are responsible for many of these deaths.

Dhatri (wet nurse) is given prime importance than other sources of feed.²⁷⁻²⁸ *Shishu prashana* (prelacteal feeds)²⁹ and milk substitutes also find their importance in the form of medicated milk of goat and cow for management of extreme situations like absence of lactation. Definite procedure of fortifying Goat or Cow's milk is mentioned to suit the nutritional needs of the baby and to humanize it by

boiling it either with *Sthira Dve* (*Desmodium gangeticum* and *Uraria picta*) or *Laghu Panchamula* (group of five medicinal plants namely *Solanum indicum*, *Solanm xanthocarpum*, *Tribulus terrestris*, *Desmodium gangeticum* and *Uraria picta*)³⁰ or *Musta* (*Cyperus rotundus*).

6th month onwards is the time for complementary feedings in the form of fruits and infant formulae in the form of bolus of *Priyala Majjadi Modaka*, *Bala Bilva Modaka*³¹ and *Shalyadi Modaka*³² (all three are the weaning foods mentioned in ayurveda to be given in the form of semisolid bolus). Former of them is mentioned in general for improving the nutritional status (Preenana). It has a perfect combination of *Priyala majja* seed of (*Buchanania lanzan*, *Laja* (puffed rice), *Yashtimadhu* (*Glycyrrhiza glabra*), honey, and *Sitopala* (candy sugar). Thus it forms a wholesome mixture of carbohydrate rich complementary feed containing essential protein. In conditions where baby has indigestion, one can give *Balabilva* (unripe fruit of *Aegle marmelos*) modaka. It contains pulp of uripe *Bilva*, *Laja saktu* (powdered puffed rice), and *Ela* (*Elettaria cordamomum*). *Shalyadi modaka* is preferred when the teeth start erupting or at 10 months of age. It is prepared either by using single cereal like rice, bajra, barley, wheat etc as per the nature of the staple food. In the later period combination of them can be adapted with addition of pulses. At this stage introduction of meat in the form of soup is also advised. On acclimatization t this schedule cooked meat can be introduced gradually considering the acceptance of the child.³³ This is followed by wholesome family pot feeding. *Prakrti* and disease specific complementary feeds like use of

Yastimadhu and *Amalaki* (*Emblia officinalis*) in *Pitta Prakriti*, *Matulunga Rasa* (juice of *Citrus medica*) in *Vatika* constitution, *laja*, *Bilva* in *Atisara* (diarrheal tendencies), *Vidanga* (*Embelia ribes*) in *Krimi*, *Ela* (*Elettaria cordamomum*) in *Chardi* (vomiting) provide insight in to dietary advice designed to suit minor ailments during infancy.³⁴

Later, preservation of health is mainly through food (*Mahabhaishajya*),³⁵ provided wholesome dietetics is followed as per guidelines (*Ahara vidhi*),¹⁵ in adequate quantity (*Matrashiteeya*)³⁶⁻³⁷ and along with avoidance of junk and unwholesome food (*Virudhahara*).³⁸⁻³⁹

Traditional Indian kitchen practices like addition of carminatives like cumins, coriander, ginger or asafetida shall increase bioavailability. Enriching with milk, curds and cheese, coconut milk or dry fruits increases nutritive value. Preparations like kheer, dates porridge, shreekhand, basundi, sweets and preparations of basin, suji, chikky, ground nut or nuts or dal puddings shall be nourishing. Fermented traditional and homemade idly, dosa, kichri, mashed veggi bhat, dalia, upma are few handful alternatives to offer continued nutritional supplements.

Prevention of nutritional deficiency

To prevent nutritional deficiencies, daily food should comprise of cereals, pulses, salt (minerals), vitamins, enough water, fats and if necessary meat.³⁷ Thus adapted healthy practices of food, with healthy physical activities will go a long way in preventing impending ill health.³⁷ To prevent seasonal diseases, dietary variations and selections are given preferences. Table 1 summarizes modification of diet as per season.

Table 1: Modification of diet as per season

Rtu (season)	Diet
Hemanta and Shishira (winter)	<i>Snigdha</i> (unctuous) and <i>Medura Ahara</i> (fatty meal) ⁴⁰
Vasanta (spring)	<i>Yava</i> (Indian Barley), <i>Godhuma</i> (wheat) ⁴¹ <i>Bhojana</i> (diet)
<i>Greeshma</i> (summer)	light, sweet, liquid and dairy rich products in ⁴²
<i>Varsha</i> (rainy season)	light foods processed with honey ⁴³
<i>Sharad</i> (autumn)	light diet predominant of <i>Madhura</i> (sweet), <i>Tikta</i> (bitter) in <i>Sharad Rtu</i> (autumn) ⁴³

Further, processing of food enhances nutritional value and at the same time makes it easily digestible and absorbable. Hence, encouraging roasted, parboiled cereals, malting, and addition of ghee, jaggery and honey is essential.

Ayushman Kumara Lakshanas (screening for healthy baby and estimation of life), ⁴⁴*Pramana shareera* (measurement of body parts) ⁴⁵ and *Samskaras* (traditional rituals at different age) reveal importance of repeated and regular nutritional and developmental assessment. In current practice too, nutritional anthropometry is a vital clinical tool to assess nutrition or in other words ‘growth for the age’. These include anthropometrical measures of weight, height, mid upper arm circumference (MUAC), weight for age and weight for height.

Current guidelines

Care of nutritional needs should be at three stages; nutrition of fetus, 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. IUGR intern be a cause for nutritional disorders in infancy and childhood. Hence, safe practice is to promote diet rich of pulses, greens, veggies and nuts, meat and dairy products. Breast feed is the first and best feed of an infant to satisfy its nutritional and psychological needs. Infant nutrition should be through exclusive

Breast feeding up to 6 months to meet the nutritional demands of the infant and to prevent morbidity. Following period is complemented with other foods along with breast feed to meet the growing needs of the infant. It could be with fruits, staple cereal based porridge enriched with sugar, jaggery and ghee at 6 months. Followed by cereal pulse based feed enriched with jiggery, sugar, oil or ghee, mashed vegetables and tubers for 6 to 9 month age. 9 to 12 months one can give soft chewable foods without spices. Cooked meat soup and fish can be introduced. Chapthis and other hard item may be soaked in milk, made soft and offered. By one year baby should be offered everything cooked at home including meat. Protein rich food like egg to be started after 10 months. ⁴⁶ Most traditional foods like khichidi, dalia, suji kheer, upma, idli, dokhla, bhaat-bhaji etc ⁴⁷ are hailed for their better acceptance, easy availability and nutritional value. Fortifying them with ghee, vegetables and introduction of egg, fish and meat can yield better outcome. Following completion of one year one can resort family pot feed. Diet in children needs equal emphasis on both quality and quantity. Toddler needs more than half the portion of the 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.

CONCLUSION

As the popular saying 'one who knows to manage diet will not easily yield to disease; food determines the life and health of humans! A wholesome management of nutrition is essential at all ages of life, as nutritional factor is one among those which influence progeny at genetic as well as epigenetic level. An emphasis on this shall yield better outcomes in all initiatives that are taken to prevent nutrition related morbidity in infants and young children. Nutritional concepts of Ayurveda target at all ages and stages of life with due importance to *Prakriti*, health, diseases, seasons as well as economy. Traditional knowledge needs resurgence in the scientific light for better community involvement.

REFERENCES

1. World Health Organization. *The global burden of disease: 2004 update*. Geneva: World Health Organization. 2008;14.
2. World Health Organization. Indicators for assessing infant and young child feeding practices Part 3, country profiles. 2010; 1.
3. Parthasarathy A editor. 4th edition reprint 2010. IAP textbook of Pediatrics. Meenakshi N Mehta. Nutrition in. New delhi: Jaypee brothers medical publishers (p) ltd.2010; 136.
4. World Health Organization. *The global burden of disease: 2004 update*. Geneva: World Health Organization, 2008.
5. *The optimal duration of exclusive breastfeeding. Report of an Expert Consultation*. Geneva, World Health Organization, 2001.
6. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Shareera sthana; Khuddika Garbhavakranti: Chapter 3, Verse 3. Varanasi: Choukamba Surabharati Prakashan, 2009;308.
7. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Shareera sthana; Shareera vichaya: Chapter 6, Verse 23. Varanasi: Choukamba Surabharati Prakashan, 2009;334.
8. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Shareera sthana; Jatisutreeya: Chapter 8, Verse 32. Varanasi: Choukamba Surabharati Prakashan, 2009;351.
9. Jaimini Pandey. Editor, 1st edn 2010. Hareeta samhita of Hareeta, trteeya sthana; Garbhopachara vidhi: chapter 49, verse 1. Varanasi: Chaukhambha Visvabharati.2010; 467.
10. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Shareera sthana; Jatisutreeya: Chapter 8, Verse 32. Varanasi: Choukamba Surabharati Prakashan, 2009;346.
11. Government of India. National guidelines on infant and young child feeding. Ministry of women and child development (food and nutrition board). 2006; 27. (Annexure 1)
12. Acharya JT, editor, (reprint ed.2002). Sushruta Samhita of Sushruta, Shareera sthana;Gharbhini Vyakarana: chapter 10, verse 4. Varanasi: Chaukhambha orientalia, 2002;387.
13. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Shareera sthana; Mahati Garbhavakranti: Chapter 4, Verse 4. Varanasi: Choukamba Surabharati Prakashan, 2009;316.
14. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Shareera sthana; Mahati Garbhavakranti: Chapter 6, Verse 13. Varanasi: Choukamba Surabharati Prakashan, 2009;332.
15. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Vimana sthana; Rasa: Chapter 1, Verse 21. Varanasi: Choukamba Surabharati Prakashan, 2009;235.
16. Sharma H, editor, (reprint ed. 2009) Kashyapa samhita of Vrdha Jivaka, Sutra Sthana; Ksheerotpatti adhyaya: chapter 19, Chaukhambha Sanskrit Sansthan, 2009;9.
17. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Shareera sthana; Jatisutreeya: Chapter 8, Verse 46. Varanasi: Choukamba Surabharati Prakashan, 2009;345.
18. Acharya JT, editor, (reprint ed.2002). Sushruta Samhita of Sushruta, Shareera sthana;Gharbhini Vyakarana: chapter 10, verse 49. Varanasi: Chaukhambha orientalia, 2002;392.
19. Sharma H, editor, (reprint ed. 2009) Kashyapa samhita of Vrdha Jivaka, Sutra Sthana; Ksheerotpatti adhyaya: chapter 19, Chaukhambha Sanskrit Sansthan, 2009;9.
20. Acharya JT, editor, (reprint ed.2002). Sushruta Samhita of Sushruta, Sutra sthana;drava dravya vidhi adhyaya:

- chapter 45, verse 49. Varanasi: Chaukhambha orientalia.,2002;200.
21. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Medicine*, 2006, 3:e442.
 22. UNAIDS, WHO. Resource needs for AIDS in low- and middle-income countries: estimation process and methods. Methodological Annex II: Revised projections of the number of people in need of ART. Geneva, Joint United Nations Programme on HIV/AIDS, 2007.
 23. Bahl R et al. Infant feeding patterns and risks of death and hospitalization in the first half of infancy: multicentre cohort study. *Bulletin of the World Health Organization*, 2005, June; 83(6):418–426.
 24. Arifeen S et al. Exclusive breastfeeding reduces acute respiratory infection and diarrhea deaths among infants in Dhaka slums. *Pediatrics*, 2001, 108(4):e67–74.
 25. Global economic prospects 2008. Washington, DC, The World Bank, 2008.
 26. Ahmad O, Boschi-Pinto C, Lopez AD, Murray CJL, Lozano R, Inoue M. Age standardization of rates: a new WHO standard. Geneva, World Health Organization, 2001 (GPE Discussion Paper No. 31).
 27. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Shareera sthana; Jatisutreeya: Chapter 8, Verse 52.Varanasi: Choukamba Surabharati Prakashan, 2009;351.
 28. Paradkar Harishastri, editor, (reprint ed. 2000). Astanga Hridayam of Vagbhata, Uttara sthana; balopacharaneeya adhyaya: Chapter 1, Verse 15. Varanasi: Krishnadas academy, 2000;778.
 29. Paradkar Harishastri, editor, (reprint ed. 2000). Astanga Hridayam of Vagbhata, Uttara sthana; balopacharaneeya adhyaya: Chapter 1, Verse 12-14. Varanasi: Krishnadas academy, 2000;778.
 30. Paradkar Harishastri, editor, (reprint ed. 2000). Astanga Hridayam of Vagbhata, Uttara sthana; balopacharaneeya adhyaya: Chapter 1, Verse 20. Varanasi: Krishnadas academy, 2000;778.
 31. Paradkar Harishastri, editor, (reprint ed. 2000). Astanga Hridayam of Vagbhata, Uttara sthana; balopacharaneeya adhyaya: Chapter 1, Verse 38-39. Varanasi: Krishnadas academy, 2000;780.
 32. Satyapal bhashagacharya (ed), (reprint 2009). Kashyapa Samhita of Vridha jeevaka, khila sthana; jatakarmotharadhyaya: chapter 12, verse 19-22. Varanasi: Chaukhambha Sanskrit Samsthan.2009;318-19.
 33. Sharma H, editor, (reprint ed. 2009) Kashyapa samhita of Vrdha Jivaka, Khila Sthana; *Jatakarmottaradhyaya*: chapter 12, verse 19-22.Chaukhambha Sanskrit Sansthan, 2009; 318-319.
 34. Satyapal bhashagacharya (ed), (reprint 2009). Kashyapa Samhita of Vridha jeevaka, khila sthana; jatakarmotharadhyaya: chapter 12, verse 15. Varanasi: Chaukhambha Sanskrit Samsthan.2009;318-19.
 35. Sharma H, editor, (reprint ed. 2009) Kashyapa samhita of Vrdha Jivaka, Khila Sthana; *Yusha Nirdeshiya*: chapter 4, verse 6.Chaukhambha Sanskrit Sansthan, 2009; 249.
 36. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Vimana sthana; Trividha Kuksheeya: Chapter 2, Verse 6.Varanasi: Choukamba Surabharati Prakashan, 2009;238.
 37. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Sutra sthana; Matrashiteeya: Chapter 5, Verse 8.Varanasi: Choukamba Surabharati Prakashan, 2009;38.
 38. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Sutra sthana; Matrashiteeya: Chapter 26, Verse 81.Varanasi: Choukamba Surabharati Prakashan, 2009;149.
 39. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Shareera sthana; Shareera Vichaya: Chapter 6, Verse 5.Varanasi: Choukamba Surabharati Prakashan, 2009;329.
 40. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Sutra sthana; Tasyashiteeya: Chapter 6, Verse 11.Varanasi: Choukamba Surabharati Prakashan, 2009;45.
 41. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Sutra sthana; Tasyashiteeya: Chapter 6, Verse 25.Varanasi: Choukamba Surabharati Prakashan, 2009;46.
 42. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Sutra sthana; Tasyashiteeya: Chapter 6, Verse 28.Varanasi: Choukamba Surabharati Prakashan, 2009;47.

43. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Sutra sthana; Tasyashiteeya: Chapter 6, Verse 36. Varanasi: Choukamba Surabharati Prakashan, 2009;48.
 44. Acharya JT, editor, (reprint ed.2009). Caraka Samhita of Agnivesha, Shareera sthana; Jatisutreeya: Chapter 8, Verse 51. Varanasi: Choukamba Surabharati Prakashan, 2009;350.
 45. Acharya JT, editor, (reprint ed.2002). Sushruta Samhita of Sushruta, Sutra sthana; Aturopakramaneeya adhyaya: chapter 35, verse 12. Varanasi: Chaukhambha orientalia.,2002;150.
 46. Elizabeth KE. (2nd edition). Nutrition and Child development. Feeding of infant and children. In.2002. 32-33.
 47. Government of India. National guidelines on infant and young child feeding. Ministry of women and child development (food and nutrition board). 2006; 27. (Annexure 1)
- Cite this article as: Reena Kulkarni: An integrated approach on child nutrition, Journal of Ayurveda and Holistic Medicine. 2013;1(2): 8-14
- Source of support: Nil, Conflict of interest: None Declared.