

INFANT NUTRITION AND STRATEGIES TO MANAGE MALNUTRITION

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Article Received on
15 Feb. 2019,

Revised on 06 Mar. 2019,
Accepted on 27 Mar. 2019

DOI: 10.20959/wjpr20195-14602

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INTRODUCTION

Adequate nutrition during infancy is essential to ensure proper growth, development and health of children to their full potential. Poor nutrition increases the risk of illness and is directly or indirectly responsible for infant morbidity and mortality. Early nutritional deficits are linked to long term impairment in physical growth, neurological development and health in general. Also, they may have impaired intellectual performance and physical strength. Infancy period of life provides a critical window of opportunity for ensuring proper growth and development of children. Malnutrition during this period may causes stunting. Women who were malnourished during

their childhood may have decreased reproductive capacity, they may have more complicated deliveries, the infants of such mothers may be born low birth weight.

As we all know that healthy children are the strength of Nation, and malnutrition is one of the major cause of ill health in children, we must develop the strategies (which are practically possible in India) to overcome malnutrition in infants and young children.

AIM AND OBJECTIVES

1. To discuss the infant nutrition.
2. To prevent malnutrition in infants.
3. To establish current strategies to manage malnutrition.

MATERIAL AND METHODS

The information is collected from Google, Medline, various Journals, Articles, Websites, Research papers, Dissertations and Thesis from different Institutes. The Reference and textbooks on pediatrics and neonatology and latest WHO guidelines, Ayurved samhitas and related texts.

INFANT NUTRITION

The term infant is applied to the young children under 1 year of age.

1. First 6 months: Exclusive breast feeding.
2. Next 6 months: Complimentary feeding is introduced.

Breast feeding

During the first 6 months exclusive breast feeding is indicated. Breast milk is considered as the ideal food and contains all the nutrients needed during this period including fats, carbohydrates, proteins, vitamins, minerals, immunoglobulin (especially Ig A), other bioactive factors and water.

It is easily digested and efficiently used by the infant's body. It contains factors in appropriate amount that augment infant's immature immune system and provides protection against infections and other factors that helps in the digestion and absorption of nutrients.

Baby must be given his first feed within ½ hour of normal vaginal delivery and within 1 hour after Caesarian section. Since then, baby must be fed every 1½ - 2 hours. The 24 hour intake of milk varies between mother-infant pair from 440ml- 1220ml averaging about 800ml per day throughout the first 6 months. To ensure adequate milk production and flow for 6 months of exclusive breast feeding, a baby needs to be fed as often and for as long as he or she wants, both day and night. This is called *on demand feeding*, *unrestricted feeding* or *baby-led feeding*.

Complimentary feeding (weaning)

After 6 months of age, breast feeding is no longer sufficient to meet all the energy and nutritional requirements of the infant by itself. Also by this time, baby usually had at least double his or her birth weight and is becoming more active. So, this is the perfect time to introduce complimentary foods (i.e. the foods and liquids other than breast milk).

During the period of complimentary feeding children are at high risk of under nutrition. There are few problems associated with complimentary feeds, such as foods being too dilute, not fed often enough or in too small amounts, or replacing breast milk while being of inferior quality. Both food and feeding practices influence the quality of complimentary feeding.

PRINCIPLES FOR COMPLIMENTARY FEEDING

1. Start at 6 months of age with small amount of food and gradually increase the quantity as the child gets older, while maintaining on demand breastfeeding.
2. Gradually increase consistency, frequency and variety of food, adapting to the infant's nutritional requirement and ability.
3. Child should be seated properly before feeds (preferably in the mother's lap).
4. Start must be with single cereal and not the mixture of many.
5. Introduce only one type of new food a week, so that intolerances can be spotted easily.
6. It is better to mix the weaning food with milk initially, since the baby is used to the taste of milk alone it is better accepted by the baby.
7. Use fortified complimentary foods or vitamins, minerals supplements for the infant, as needed.
8. Increase fluid intake during illness including more frequent breastfeeding, and encourage the child to eat soft and favorite foods.
9. Practice good hygiene and proper food handling.
10. Feed slowly and patiently. Encourage children to eat but don't force-fed them.
11. Assist older children when they feed themselves.
12. Remember that feeding times are period of learning and love-talk to children during feeding, with eye-to-eye contact.
13. It is but natural that some of the semisolids given will be coming out of the mouth initially. It is not spitting or rejection of the food (since the child moves his tongue as though for sucking).

METHOD OF INTRODUCING COMPLEMENTARY FEEDS

| Age (months) | Energy needed in addition to BF(kcal/day) | Consistency and type of food | Frequency | Quantity |
|--------------|---|--|---|---|
| 6 – 8 | 200 | Start with thick porridge, well mashed food. Continue with mashed family food. | 2 – 3 meals per day. May increase depending child's appetite. | Start with 2-3 tsf per feed, gradually increase to ½ of the 250ml of cup. |
| 9 – 11 | 300 | Finely chopped or mashed food and foods that baby can pick- up | 3 -4 meals per day. May increase depending child's appetite. | ½ of the 250 ml cup or bowl. |
| 12 | 550 | Family foods chopped or mashed if necessary. | 3 – 4 meals per day. May increase depending child's appetite. | ¾ th of the 250mlcup or bowl. cup. |
| 9 – 11 | 300 | Finely chopped or mashed food and foods that baby can pick- up | 3 -4 meals per day. May increase depending child's appetite. | ½ of the 250 ml cup or bowl. |
| 12 | 550 | Family foods chopped or mashed if necessary. | 3 – 4 meals per day. May increase depending child's appetite. | ¾ th of the 250ml cup or bowl. |

AYURVEDIC REVIEW

Ancient Ayurveda texts also provide description about the feeding of newborns and the systematic introduction of different kind of feeds thereafter. There is a concept of 16 Samskaras in Hindu texts i.e. some ritual or practice through which a person should go through in different phases of his/her life. Out of those 16 Samskaras, the first, which is the practice to be done just after birth of the baby, is *Jatakarma Samskara*. Every other acharyas have their own view about what should be administered first to the newborn before he/she is introduced with mother's milk.

According to acharya Charaka, after enchanting relevant Mantras, the baby is allowed to lick unequal amount of honey and *ghruta* before starting breast feeding, that too from the right breast first. The view of acharya charaka is the most scientific and is nearer to the modern medical science.

According to acharya Sushruta, baby should be provided with breast milk on the fourth day of life unlike Charaka who believed to start it right from the first day of life. He stated that on

the first day, baby should be given unequal amount of honey and *ghruta* mixed with *Ananta* (a drug) three times. On the second and third day, *ghruta* mixed with *Lakshmana* (a drug) again three times throughout the day. On the fourth day, baby should be provided with honey and *ghruta* in the amount which can fill baby's palm, two times, thereafter breast feeding is started.

According to acharya Vagbhat also breast feeding is started on the fourth day just like Sushruta. However there are few differences in their opinion like on the fourth day, *Navneeta* is mentioned in *Ashtanga hridaya* and *ghruta* in *Ashtanga Sangraha* in place of *madhu* (honey), *sarpi* (*ghruta*) mentioned in Sushruta samhita. Vagbhat has also mentioned that some milk must be extracted and discarded, before starting first breastfeed of the baby.

There is a controversy about interpretation of the drug Ananta. Some scholars believe that Ananta of Sushruta is Swarna, as it is having budhhi and medhawardhana properties.. Various comentators of Vagbhat have different view regarding this. Indu considered it to be Durva, Arundatta as Yavasak and Haranchandra as Sariva. Durva seems to be the most appropriate interpretation as it has anticoagulative properties and neonates are at high risk of bleeding due to various causes like coagulopathies.

The timing and the type of weaning food that should be introduced during infancy also mentioned in Ayurvedic texts with some degree of variation. Most of the *Acharyas* like Sushruta and Vagbhata indicated *Annaprashana* i.e. systematic introduction of the preparations made from various cereals and grains, at the age of 6 months. *Acharya* Kashyapa on the other hand, first considered the introduction of soft fruit pulps or fruit juices i.e. *Phalaprashana* at the age of 6 months and then *Annaprashana* at the age of 10 months.

STRATEGIES TO MANAGE MALNUTRITION

There can be following approaches to manage malnutrition:

1. Nutritional Planning

This involves formulation of nutritional policies and overall long-term Planning to improve production and supplies of food, ensure its equitable distribution and program to increase purchasing power of people.

The global strategy for infant and young child feeding is the overarching framework for action by government and all concerned parties to ensure that the health and other sectors are

able to protect, promote and support appropriate infant and young child feeding.

The global strategy reaffirms and builds on the protection, promotion and support of breast feeding that was adopted in 1990 and revitalized in 2005.

1. To appoint a nutritional breast feeding coordinator with appropriate authority and establish multi sectoral national breastfeeding committee, composed of representative from relevant government departments, NGOs and health associations.
2. There should be a law protecting the breastfeeding rights of working women and establishing means for its enforcement.
3. There must be a comprehensive policy on infant and young child feeding, child and reproductive health, and poverty reduction; and a body to develop, implement, monitor and evaluate these policies timely.
4. Spreading the awareness in the society about infant feeding, malnutrition and its short-term and long-term adverse effects.
5. Promote timely, adequate, safe and appropriate complementary feeding with continued breastfeeding.

2. Improved health care system

- a) Infections like malaria, measles and diarrhea are prevalent in our society and they precipitate acute malnutrition among children and infants.
- b) A good healthcare system that provides immunization, oral rehydration, periodic deworming, early diagnosis and proper treatment of common illness can go a long way in preventing malnutrition.

3. Nutritional education

People can be educated on

- a) Nutritional quality of various locally available and culturally accepted low cost common foods.
- b) Importance of exclusive breast feeding for 6 months and continuing it up to 2 years along with proper weaning.
- c) Recipes for preparing proper weaning foods and good supplementary food from locally available low cost food.
- d) Importance of including milk, eggs, meat or pulses in sufficient quantities in the diet to enhance the net dietary protein value.
- e) Damage caused by irrational beliefs and cultural practices of feeding.

f) Importance of immunization and proper sanitation in their day to day life.

4. Early detection of malnutrition and intervention

- a) A well recorded growth chart and the anthropometric parameters can detect malnutrition very early.
- b) The Velocity of growth is more important than the actual weight at a given time.
- c) If the growth of the child is slowed or is arrested, the physician should be alerted and any hidden infection or any reason for nutritional deficiency must be evaluated and taken care of.

5. Nutritional supplement

Usually biologically vulnerable groups like pregnant women, infants and young children are targeted by various welfare measures conducted by the government.

Calories, proteins and micronutrients like iron, vitamin A and zinc can be supplemented.

OBSERVATION

It is observed that the infants that are exclusively breastfed during the first 6 months of life and are started with proper weaning thereafter, have better physical and mental performances and health in general.

CONCLUSION

Infancy is the phase of rapid physical growth and neurological development. Nutritional deficits during this period can lead to various adverse short-term and long-term outcomes. So we must pay attention to the causes leading to malnutrition among infants and young children in our society and need to correct them with the help of various strategies working out all together to make our society free from malnutrition. This will improve general health and wellbeing of children and will increase the resistance to infectious illness and thereby decrease morbidity. This will also accelerate the physical growth and mental development of children. Also, improve academic performance and learning abilities of children.

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