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AYURVEDIC CONCEPT OF SUPPLEMENTATION OF MICRONUTRIENTS

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Introduction

The term micronutrient is coined as they are required in very tiny amounts. although they are required in small amounts their deficiencies may lead to serious health problems. Hence their requirement is equally important in our daily diet for maintaining health.

Micronutrients are commonly taken as vitamins (like A, B-complex, C, D, E, K,) and minerals (like Na, K, Mg, Iodine, Cu, Zn etc). As they are required in small quantities we get them from our diet and other food Supplements. Hence supplementation has to be monitored , to maintain the health equilibrium and enhance the body condition if it is detoriating due to their deficiencies.

Ayurveda, the ancient Indian science has elaborative and useful concepts about the diet and dietary supplements. Merely knowing them is not important, but going to the depth of knowledge ; the ancient concepts should be explored and their vitality should be presented in concise and practically useful manner.

Prevalence

According to WHO and IFO Micronutrients Malnutrition (MNM) is widely spread in developing regions of the world. All age groups are affected by it, but young children and women of reproductive age group are at high risk.

Micronutrients malnutrition can lead to morbidity and mortality too. Morbidity prevalence accounts for 7.3% of global burden of disease whereas mortality data is around 0.8 million deaths(1.5% of total).

Iron, Vitamin A and Iodine are the most common forms of MNM and together these affect at least 1/3 of world's population. It is estimated that 2 billion people are anaemic, just under 2 billion have inadequate iodine nutrition and 254 million preschool age children are vitamin A deficient.[1]

Concept of Micronutrient Supplementation in *Ayurveda*[2,3,4]

life style modification in present era has lead the healthy individuals to use process food items and practice faulty food habits. This has landed them in various macro and micro-nutrient deficiency.

Ayurveda ancient Indian science proves its vitality in overcoming these deficiencies. Apart from the concept of Dinacharya and Ritucharya we find following concepts that keeps the health equilibrium of individual right from the antenatal period.

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A) Concept of Garbhini Paricharya

Acharya Charak and Sushrut have included milk and milk products in garbhini parcharya.It is evident from this vision Acharyas that Pregnant mother receives all the essential macro and micro nutrients for healthy growth of foetus as these milk products have most of vitamins and minerals.

B) Concept of Madhu-Ghrit lehan at Birth

Just after the birth, before lactation babies are given madhu-ghrit lehan. This procedure not only aims at to promote the gut motility for the passage of meconium but also helps to meet the macro and micro nutrient requirement of an infant.

Sushrut has given three day nutritional programme for an infant till the effective establishment of lactation occurs. He recommends madhu-ghrit with Ananta on first day. Apart from ghee and honey if Ananta is taken as Durva herb it is very much essential for newborn to avoid bleeding disorders as it is a rich source of vitamin K.

C) Concept of Suvarna-prashan

Gold rubbed against clean stone with water is mixed with honey and ghee and is then given to the child. Use of elemental gold is promoted as it is best among four lohas and it reveals the property of medhya, rasayan and vrishya. Gold might have been used with intention of enhancing the intellectual and immune power in the child.

D) Concept of Lehan

Lehan can be used for healthy as a preventive and curative aspects. Various indications have been described by acharya Kasyap for lehan. Lehan fortified with micronutrients can be encourage for preventive and curative aspect.

E) Concept of Falprashan and Annaprashan

Only Kasyap has introduced the concept of falprashan. At 6 months this ceremony has to be performed. Till 6 months, Baby is exclusively breast feeded, but after this he needs an extra amount of nourishment for which falprashan was introduced. It is well known entity that most of vitamins and minerals have sources from fruits and vegetables, hence Kashyap might have recommended falaprashan to enriched these micronutrients for optimum growth and development.

At 10th Annaprashan ceremony is started. In this ceremony child is introduced with cereals, grains, vegetables, meats in very slow and steady manner. Considering the concept of micronutrients, all these supplements are given to child so as to endowed him with all essential vitamins and minerals.

Micronutrients Contents in Herbal Drugs[5,6,7]

Amalki (Emblica Officinalis)

-Vitamin C -Carotene -Nicotinic acid -Riboflavin

Guduchi (Tinospora Cardifolia)

-Calcium -Copper -potassium -Cobalt

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-Sodium -Zinc -Magnesium -Nickel

-Iron -Cadmium -Manganese -Chromium

Vidarikanda (Pureria Tubrosa)

-Calcium -Cobalt -Potassium -Copper

-Sodium -Zinc -Magnesium -Nickel

-Iron -Cadmium -Manganese -Cromium

Dhataki (Woodfordia Floribunda)

-Carotene -Thiamine -Nicotinic acid -Vitamin C

-Riboflavin -Citric acid

Amra (Mangifera Indica)

-Vitamin A -Vitamin B -Vitamin D -Vitamin C

Kathar, Fanas (Artocarpus Integrifolia)

-Vitamin A -Vitamin C -Iron -Phosphorus

-Calcium -Vitamin B-1 and B-2 (in seeds)

Kadali (Musa Sapientum)

-Vitamin C -Vitamin B -Potassium

Narikela (Cocus Nucirera)

-Vitamin C -Phosphorus -Viamin A(Less amount)

-Vitamin B-1 -Iron -Vitamin E(Less amount)

Kharbujam (Cucumis Melo)

-Calcium -Phosphorus -Iron -Copper

-VitaminA -Vitamin B-1, B-2 -Vitamin C

Talarasa, Tadajam (Borasus Flabellifer)

-Yeast i.e. Vitamin B

Kapittha (Pheronia Elephantum)

-Calcium -Phosphorus -Iron (In fruits)

-VitaminB-2 -Vitamin C

Makhanna (Eurale Ferox)

-Iron(1.4mg/100gm) -Calcium -Phosphorus - Carotene

Akharot (Juglans regia)

-Vitamin A -Vitamin B -Vitamin C

-Iron -Calcium -Phosphorus -Copper

-Zinc -Magnesium -Cobalt -Manganese

-Potassium -Sodium -Iodine

Jambir (Citrus lemon)

-Vitamin C (More amount) -Vitamin B-1 -Carotene

Nibukkam (Citrus medica)

-Vitamin C -Citric acid

Amalika (Tamarindus indica) -Citric acid

Yava (Hordeum vulgare)

-Calcium -Iron -Vitamin C

Godhum (Triticum sativum)

-Iron -Copper -Zinc

-Magnesium -Mangnese

Arahar (Cajanus indicus)

-Calcium -Phosphorus -Vitamin A -Vitamin B-1

Chanaka (Cicer arietinum)

-Calcium -Phosphorus -Vitamin A -Vitamin B-1

Kulattha (Dolicus biflorus)

-Calcium(0.28%) -Phosphorus(0.39%) -Iron(7.6mg/100gm)

-Nicotinic acid(1.5mg/100gm) -Vitamin (119units/100gm)

Vastuka (Chenopodium album)

-Carotene -Vitamin C

Sugandhi Vastuka (C. ambrosioides)

-Vitamin C -Magnesium phosphate

Tanduliya (Amaranthus spinosus)

-Calcium (0.8mg/100gm) -Iron(23mg/100gm)

Kushmanda (Benincasa cerifera)

-Vitamin B-1(21 units) -Minerals (0.3 parts)

Kunduru (Coccinia Indica)

-Calcium (0.4%) -Phosphorus (0.03%) -Iron (1.4mg/100gm)

-Vitamin A (260units/100gm) -Vitamin C (28mg/100gm)

Micronutrient Content in Wholesome Diet[8]

Table 01 : Milk (Cows Milk) and its micronutrient content

Vitamins	Quantity per Litre	Minerals	Quantity per Litre
Vitamin A (IU)	1299.5	Calcium (mg)	1277.3
Vitamin B-1 (mg)	0.39	Chlorine (mg)	1031.36
Vitamin B-2 (mg)	1.67	Copper (mg)	0.1

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Vitamin B-3 (mg)	0.87	Iodine (mcg)	237.21
Vitamin B-6 (mg)	0.43	Iron (mg)	0.52
Vitamin B-12 (mg)	3.68	Magnesium (mg)	138.2
Vitamin C (mg)	9.69	Phosphorus (mg)	963.28
Vitamin D (IU)	41.25	Potassium (mg)	1567.66
Vitamin E (IU)	1.54	Selenium (mcg)	15.47
Vitamin K (mcg)	41.25	Sodium (mg)	505.36
Pantaothenate (mg)	3.24	Zinc (mg)	3.92
Biotin (mcg)	19.6	Manganese (mg)	0.04
Folate (mcg)	61.57	Molybdenum (mcg)	20.63

Honey

Carbohydrate and sugar contents forms major part but it includes following micronutrients -

Vitamins-Riboflavin, -Niacin, -Vitamin B-6, -Folate, -Vitamin C, -Pantathanic acid

Minerals-Calcium, -Iron, -Magnesium, -Phosphorus, -Potassium, -Sodium, -Zinc

Ghee

- Ghee is almost composed of fat - 1 teaspoon of ghee contains 8mg of cholesterol.
- Ghee is highly rich in vitamin A and vitamin D
- It is supportive for eye, legs, hands and bone health .
- It helps in the absorption of vitamins, minerals and phytonutrients.

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Table 02 : Micronutrients and their sources

Micronutrient	Wholesome diet Sources	Herbal Sources
Vitamin A	Carrot, sweet potato, spinach, pumkin, papaya, mango, pea, apricot, milk, egg.	Amra, Kathar, Narikela, kharbujam, Akharot, Arahar
Vitamin B-1	Wheat germ, dry beans, peanuts, soyabean, egg yolk, liver.	Amra, Kathar, Narikela, Kharabujam, Akharot, Jambir
Vitamin B-2	Millets, legumes, green leafy vegetables, milk, egg, meat, fish.	Dhataki, Kathar, Kharbujam, Kappitha,
Vitamin B-5	Whole cereals, pulses, groundnut, fish, liver, kidney, meat, poultry.	
Vitamin B-6	Wheat germ, whole cereals, legumes, oil seeds, green leafy vegetables, nuts, milk, eggs, meat, liver, fish.	
Vitamin B-12	Not present in foods of vegetable origin, liver, meat, fish, kidney, brain, egg.	
Vitamin C	Cabbage, lettuce, spinach, amaranth, cucumber, lemon, oranges, melon.	Amalki, Guava. Amra, Narikela, Kappitha, Kharbujam,Akharot, Dhataki
Vitamin D	Fish liver oil, egg yolk, liver, fish.	Amra
Vitamin E	Wheat germ oil, corn oil, cotton seed oil.	Narikela
Calcium	Millet, soyabean, fenugreek leaves, almond nuts, mustard seeds, milk, milk products, fish.	Amaranth, drumstick, Kathar Kappitha, Akharot, Arahar Makhanna, Kullatha
Iron	Lentils, cereals, millet, cow pea, roasted bengal gram, mustard leaves, liver.	Amaranth, Kathar, Kappitha, Narikela, Makhanna
Zinc	Cheese, nuts, wheat, legumes.	Akharot
Iodine	Sea foods, vegetables grown in soil, water.	Akharot
Phosphorus		Kathar, Makhanna, Narikela,

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		Arahar, kunduru, Chanaka

Recommendaions[9,10]

- Regular interval health check up camps and school surveys should be promoted to overcome nutritional disorders.
- Evaluation of micronutrient deficiencies in children on the basis of clinical evidence and biochemical profile.
- Well balanced diet including all the essential micronutrients supplements should be recommended.
- Food Fortification with vitamins and minerals should be encouraged so as to meet the demanding needs of micronutrients.
- Wholesome dietary supplements like milk, ghee, honey, pulses etc involving essential micro-nutrients should b given daily.
- Colours orange, green, red, yellow, blue, purple, represent five different groups plus the oil, children should eat food from all the groups every day.
- According to WHO consumption of fruits, vegetables, legumes, whole grains and nuts should be increased.
- Limit intake of simple sugars , salt/sodium and ensure that salt is iodized.
- Treatment principle should be modulated on the basis of micronutrients to promote the herbal drugs fortified with essential micro-nutrients.
- Regular and frequent micronutrient fortification or supplementation should be encouraged as it is significant in growing children who requires a sustained supply of micro-nutrients for growth and development.

Conclusions

- *Ayurveda* has its unique concept of micronutrient supplementation in terms of *garbhini paricharya, navajat shishu poshan, lehan* and *prashan*. At most care has been taken during prenatal and infancy period to avoid micronutrient deficiency disorders in later part of life.
- Wholesome diets like milk, *ghrit*, honey have high micronutrient content in them and hence are recommended for healthy growth and development of child.
- There are variety of commonly used herbal drugs which are rich in micronutrient content and hence can be used for preventive as well as curative aspect.

- Micronutrients and their dietary and herbal sources have been compiled in tabulated form which can be recommended for various micronutrient deficiency disorders.

References

1. Guidelines on food fortification for micronutrients: Edited by -Lindsay Allen, WHO and Food and Agriculture Organisation of United Nations 2006.WHO, 20 Avenue Appia, 1211 Geneva 27, Switzerland.p.n.-36,37
2. Sushrut Samhita Sharir sthana 04/41, 43 Reprint 2007 Dr, Ambikadatta Shastri(AFM), Chaukhamba Sanskrit Sansthan,k-37/116, Gopal Mandir Lane, Varanasi, -221001
3. Charak Samhita Sharir sthana 08/31,21,Dr.Bramhanand Tripathi,7th edition 2000, Chaukhambha Surbharti Prakashan ,K-37/117,Gopal Mandir Lane, Varanasi, -221001
4. Kashyapa Samhita - Pandit Hemraj Sharrna, Reprint-2010, Chaukhamba Publications 4262/3, ansari road, darya ganja, New Delhi-110002 (India).
5. Database of Medicinal Plants- Central Council for Research in Ayurveda and Siddha, Department of Health and Family Welfare (Government of India).
6. Arun Kumar etal/ Natural Sciences 3 , 2011,jouranal page no. 551-555.
7. Bhavaprakasha Nighantu - Prof.K.C. Chunekar Edition 2010, Chaukhambha Bharti Academy, Varanasi, K. 37/109, Gopal mandir lane, Varanasi-221001 P.N.-538 to 690.
8. Wikipedia, USDA, Nutrients, Database Source.
9. Guidelines on food fortification for micronutrients: Edited by -Lindsay Allen, WHO and Food and Agriculture Organisation of United Nations 2006.WHO, 20 Avenue Appia, 1211 Geneva 27, Switzerland

Dr. Alka Mohan Chutani, Senior Dietician, Nutrients Biochemistry, Nutrition and Dietary Habits, AIIMS, New Delhi, 26 Aug. 2006.