

JOURNEY OF The first 1000 days: National Health Mission



Dr. Sharda Jain

MNAMS, FICOG, FIMSA, DHM, QM & AHO
PGDMLS (Symbiosis)
Director Lifecare Centre, Lifecare IVF
Secretary General of Delhi Gynaecologist Forum
Chairman of North India Gynaecologist Forum



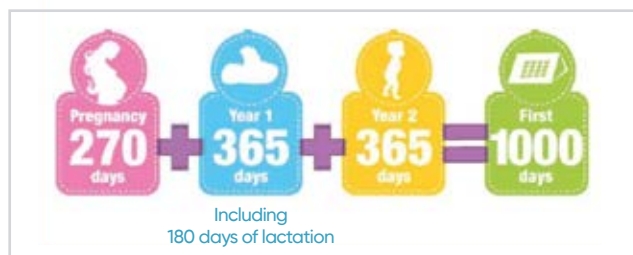
Dr. Renu Chawla

M.D., Sr. Consultant Gynaecologist,
Kailash Deepak Hospital, Delhi
Joint Secretary DGF EAST
Past Treasurer DGF EAST

“We as gynaecologists are obsessed with haemoglobin before and during pregnancy. We commonly prescribe iron, folic acid & calcium supplements. But we should equally focus on correcting MMN deficiency in pregnancy.”

India has taken a rapid stride in reducing maternal mortality (97/10,000 births) and improving child survival. Anaemia Mukht Bharat & early childhood development are the strongest public investments a country could make. This allows children to reach their full potential while also enabling the country to focus on **Sustainable Development Goals (SDGs)** at the same time.




The first thousand days of life are the most crucial as it establishes a solid foundation for a child's physical and mental health, leading to the rest of their lives. The power of the first thousand days encompasses the right nutrition for the mother, stimulation, love, and support for the growing baby, beginning with preconception, pregnancy, and continuing in the first two years of a child's life.



What is the First 1,000 Days?



The time between **conception** and a **child's second birthday**. During this period, the foundations of:

-  Optimum Health
-  Growth
-  Neurodevelopment

are established for the rest of the child's life.

The roadmap of the journey of the first 1000 days should be clear to all caregivers, health professionals, parents, and would-be parents to promote and create shared value for children's development across various sections in India.

BARKER HYPOTHESIS

Dr. David Barker first popularised the concept of **foetal origins of adult disease (FOAD)**, popularly known as the 'Barker Hypothesis'. Since its inception, the FOAD hypothesis has received considerable attention. It says that events during the early development of a child have a profound impact on the development of diseases during adulthood. Low birth weight is a surrogate marker of poor foetal growth & nutrition and a proxy for intrauterine growth retardation (IUGR). It is also linked to various chronic diseases like coronary artery disease (CAD), hypertension, obesity, insulin resistance, & type 2 diabetes.

Table 1: Chronic Disease Associated with Barker Hypothesis

1 Obesity	7 Stroke
2 Diabetes mellitus	8 Renal failure
3 Dyslipidaemia	9 Liver failure
4 Hypertension	10 Lung abnormalities
5 Coronary artery dis.	11 Immune dysfunction
6 Alzheimer disease	12 Many psychiatric diseases

THE FIRST 1000 DAYS OF NUTRITION ARE CRUCIAL FOR IQ & INTELLIGENCE

At birth, the average baby's brain is about a quarter of the size of the average adult brain. Incredibly, it doubles its size in the first year. It grows to about 80% of adult size by age 3 years and is nearly fully grown by age 5 years.



By the age of 3, 80% of the human brain is developed. During these formative years, factors such as adequate health-care, good nutrition, early learning, stimulation (both in utero and after birth), quality childcare practices, and a clean and safe environment have a big influence on the child's future.

The Government of India has also acknowledged the importance of the first 1000 days of a child's life by shifting the focus of Rashtriya Bal Swasthya Karyakram (RBSK) from only 'survival' to 'healthy survival'.

*"Many things we need can wait.
The child cannot.
Now is the time his bones are being
formed, his blood is being made,
his mind is being developed.
To him we cannot say tomorrow,
his name is today."*

- Gabriela Mistral

WHY 1000 DAYS?

WHAT MAKES US HUMAN IS OUR BRAIN.

Apart from physical growth, a human baby's brain development paves the way for its intelligence and quality of life in the future. Many of these developments start even before a baby is born.

Remember, a foetus is not only dependent on its mother's nutrition but also on her haemoglobin and mental and emotional health.

What a mother does in the first 1000 days makes a difference to the rest of the baby's life, in terms of both health and diseases.

The amalgamation of prenatal and early postnatal nutrition has given rise to the inimitable concept of the first 1000 days of nutrition, which is now globally recognised in developed and developing countries.

According to this, the first 1000 days of a child's life are a period of unique opportunity, called as "Window of opportunity", when the foundations of optimal physical growth, health, and brain development are established for a lifetime.

HIDDEN HUNGER

Hidden hunger is a common nutritional deficiency in pregnancy. It can happen even without a deficit in energy intake as a result of consuming an energy-dense but nutrient-poor diet.

Deficiencies of micronutrients are inherited across generations. There is an inter-generational, self-perpetuating cycle of Anaemia and Multi Micronutrient (MMN) deficiency among Indians.

Poor iron storage at birth leads to low iron content in breast milk. The increased requirement of iron during pregnancy in adolescent women aggravates low iron intake during infancy and childhood, creating a vicious cycle of low iron stores at birth. The common micronutrient deficiencies are shown in Fig. 3 and their short-term and long-term consequences in Table 2.

Fig-3: Estimated prevalence of micronutrient deficiencies in pregnant women

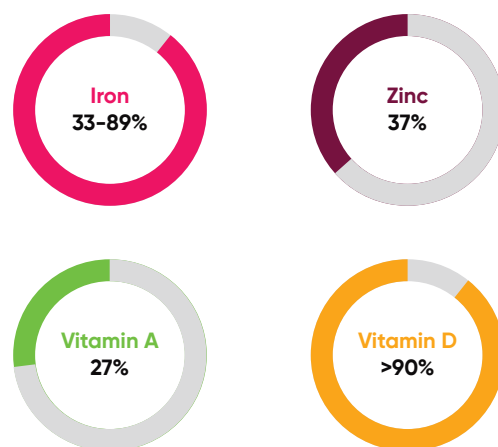


Table-2: Short-term consequences

- Spontaneous or recurrent pregnancy loss
- Increased risk of congenital anomalies
- Compromised birth size
- Compromised neurological development, function and cognition
- Increased risk of preterm delivery
- Postnatal micronutrient deficiency

Long-term consequences

- Potential cardiovascular consequences
- Potential risk of altered blood pressure, kidney function, and insulin resistance
- Compromised cognitive, motor, and socio-emotional development of offspring
- Increased risk of poor birth outcomes and chronic disease in the offspring
- Increased risk of obesity, hypertension, and mortality in the mother

HOW TO CORRECT MMN DEFICIENCY IN PREGNANCY?

We as gynaecologists are obsessed with haemoglobin before and during pregnancy. We commonly prescribe iron, folic acid & calcium supplements. But we should equally focus on correcting MMN deficiency in pregnancy. WHO suggests that essential micronutrients are important for pregnant women. (Table 3)

Table-3: Essential nutrients during pregnancy by WHO

Micronutrients	Pregnant women
Vitamin A	800.0 µg
Vitamin D	5.0 µg
Vitamin E	15.0 mg
Vitamin C	55.0 mg
Thiamine (vitamin B1)	1.4 mg
Riboflavin (vitamin B2)	1.4 mg
Niacin (vitamin B3)	18.0 mg
Vitamin B6	1.9 mg
Vitamin B12	2.6 µg
Folic acid	600.0 µg
Iron	27.06 ^b mg
Zinc	10.0 mg
Copper	1.15 ^c mg
Selenium	30.0 µg
Iodine	250.00 ^d µg

Iron	Prevents Anaemia, Preterm Delivery & Mental Retardation
Iodine	Supports Fetal Growth & Development Prevents Cretinism
Calcium	Maintains Skeletal, Neuromuscular & Cardiac Functions
Zinc	Regulates Gene Expression, Prevents Anaemia & Low Birth Weight
Copper	Prevents Anencephaly & Low Birth Weight
Selenium	Prevents NTD, Abortion & Dysfunction of Brain & CVS
Magnesium	Prevents Increased Blood Coagulability & Preterm birth

Although a healthy and varied diet is the preferred means of meeting nutritional requirements, some nutritional needs during pregnancy are challenging to meet with diet alone. Besides this, the nutritional requirements also change from first to third-trimester, for both the mother and the baby. In the first trimester, there is organogenesis whereas in the second & the third-trimester foetus gains weight and its organs are matured. Foetal brain development and cognitive function depend upon many micronutrients, trace elements, and DHA, especially in the late second & third trimesters. Folic acid supplementation in early pregnancy reduces foetal neural tube defects as well other birth defects. Besides, it reduces homocysteine levels which takes down the incidence of adverse obstetric outcomes.

However, in high-risk pregnancies, Methyl-THF is a better alternative due to widely prevalent genetic polymorphism in MTHFR gene. Supplementation of the natural form, 5-methyl-THF, is a better alternative to supplementation of folic acid, especially in countries not applying for a fortification program.

Multiple micronutrient deficiencies including but not limited to Vit. A, Zinc, Vit. B12, Iodine, and Folate often coexist among pregnant women in India. Studies suggest the prevalence of Zinc deficiency is 37%, Vitamin A deficiency is 27% & Vitamin D deficiency is more than 90%

SHORT & LONG TERM CONSEQUENCES OF MATERNAL MMN DEFICIENCY

Inadequate maternal micronutrients status during the second & third trimesters of pregnancy might compromise birth size. Nutritional inadequacies of the developing foetal brain & CNS might compromise neurological development, function & cognition. Inadequate maternal nutritional status including MMN increases the risk of poor birth outcomes and chronic disease in the offspring and obesity, hypertension, and mortality in the mother.

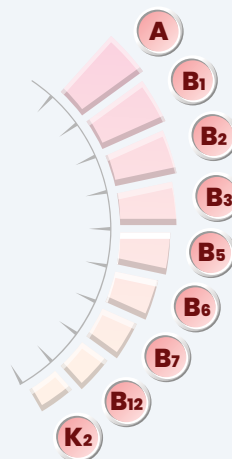
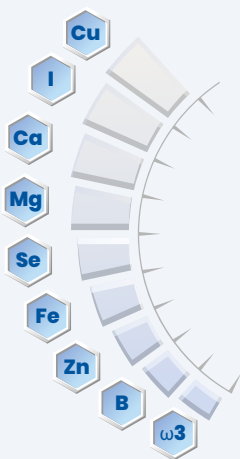
EVIDENCE-BASED EFFICACY FOR MMN SUPPLEMENTATION

- ✓ From large randomised trials, it is seen that pregnant women who received MMN supplementation had fewer LBW and SGA babies.
- ✓ It has been observed in many studies that infants whose mothers consumed MMN supplements had an 18% reduction in early infant mortality compared to mothers who relied on just Iron & Folic Acid.
- ✓ Combined foetal loss & neonatal deaths are reduced by 11% and 14% lead sign of CBM is observed for these in the MMN group.

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