

MICRONUTRIENT DEFICIENCY IN AFRICA

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SCOPE

- Micronutrient deficiency in the world
- Negative consequences of micronutrient deficiency
- Main strategies for prevention of micronutrient deficiency
- Conclusion and recommendations for ensuring sustainability of prevention programs

Micronutrient deficiency in the world

- Low income and food deficiency
- Iron deficiency and Iron deficiency anemia (IDA)
- Vitamin A deficiency (VAD)
- Zinc deficiency
- Iodine deficiency
 - Goiter
 - Iodine deficiency disorders (IDD)

The prevalence of some nutrition disorders and micronutrient deficiency in the world

- 2 billions people have anaemia
- 2.2 billions people have iodine deficiency
- 1 billion people have hypotrophy
- 1 billion people have excess of weight

- 9 billions people are at risk of zinc deficiency
- 180 millions of children are stunted
- 120 millions of children under 5 years of age have Vitamin A deficiency

- Prevalence of anaemia worldwide

WHO estimates the number of anaemic people worldwide to be a staggering two billion and that approximately 50% of all anaemia can be attributed to iron deficiency.

1/3 of the population in Africa have iron deficiency.

Anaemia is an indicator of both poor nutrition and poor health. Iron deficiency in its most severe form
IDA

THE MULTIFACTORIAL ETIOLOGY OF ANAEMIA

- Iron deficiency ($\geq 50\%$ of anaemia)
- Other nutritional deficiencies besides iron, such as:
 - Vitamin B12
 - Folate
 - Ascorbic acid
 - Vitamin A
- Infectious diseases
 - Malaria
 - Helminthiasis
 - Tuberculosis
 - HIV/AIDS etc

- Folic acid deficiency contributes to development of congenital neural tube defects (CNTD) in fetus in first 4 weeks of pregnancy, when women do not know on beginning of pregnancy
- 1-3 patients are seen per month in Tanzania referrals hospitals
- 0-2 patients are seen per months in Ifakara st. Francis Hospital

Negative consequences of micronutrient deficiency

- Iron deficiency and Iron deficiency anemia (IDA)
- Folic acid deficiency (FAD)
- Vitamin A deficiency (VAD)
- Zinc deficiency
- Iodine deficiency
- Goiter

following anaemia :

Increased risk of maternal and child mortality due to severe anaemia

- Iron deficiency affect adversely on:
- the physical capacity and work performance of adolescents and adults
- the immune status morbidity from infections of all age groups.

Negative consequences of iron deficiency and IDA

□ The negative consequences of IDA on:

- cognitive and physical development of children
- work productivity of adults are of major concern.

□ Severe IDA:

- impairs the maintenance of body temperature in adults exposed to a cool environment
- impairs cognitive performance and behavior at any age.
- The high prevalence of anaemia in surgical patients may:

- increase the risk of postoperative morbidity and mortality.
- □ In general, these effects are corrected by iron supplementation or food fortification,
- but:
- □ if moderate to severe iron deficiency occurs in infancy, the effects on cognition may not
- be reversible.

- kiAne study in Ifakara:

Intermittent treatment for malaria and anaemia control at time of routine vaccinations in Tanzanian infants: a randomized, placebo-controlled trial-reduced the rate of clinical malaria and severe anaemia by delivering an available and affordable drug through the existing EPI system(2001)

Now data for cost effectiveness of intermittent treatment in areas in malaria endemicity.

Consequences of Vitamin A deficiency

Eye pathology

- Night-blindness

- Blindness

1. Bitot's spot

2. Xerosis

3. Corneal ulcer

4. Keratomalacia

Consequences of Vitamin A deficiency ...

- Systemic damage of epithelial tissue
- Increased infections
 - Respiratory tract
 - Eye
 - Skin
 - Gastro-intestinal tract
 - Urino-genital system

Increased morbidity and mortality in children under five years of age

- Disorder in iron metabolism
- Decreased growth of children
- Increased risk of oncological pathology

- kiviA study in Kilombero- A randomised controlled trial of the safety and efficacy of two vitamin A supplementation schedules in Tanzanian infants(2003)

Consequences of Zinc deficiency

Because of involvement of zinc in so many core areas of metabolism, the features of zinc deficiency are frequently quite basic and nonspecific, including:

- alopecia
- diarrhea
- delayed sexual maturation and impotence
- eye and skin lesions, and
- Impaired appetite etc.



Consequences of zinc deficiency can be corrected with:

- zinc supplementation or
- zinc fortification
- zinc ORS in East Africa, training in 2006/07

IODINE DEFICIENCY

- Study in Tanzania
- Most deficiency from soils lacking iodine salts or fertilizers with no iodine
- Remaining challenges in Tanzania's efforts to eliminate iodine deficiency (*Vincent D et al*)

- The study revealed that 83.3% of households (n =21 160) in the surveyed districts used iodised salt.
- Also, 94% of sampled shops (n= 397) sold iodised salt

- The total goitre prevalence had decreased
- significantly in all districts from an unweighted mean of 65.4% in the 1980s to 24.3% in 1999 (P , 0.05).

- Conclusion indicated that iodine deficiency is largely eliminated in the 16 districts categorised as severely iodine-deficient in Tanzania,
- and that the iodine content of salt purchased from shops is highly variable.

Conclusion and recommendations for ensuring sustainability of prevention programs

- Adopting a Law in all countries, which includes appropriate clauses on:
 - - Mandatory fortification of first and supreme grades of food produced in the country
 - - Importation of only fortified food

Reference

- Remaining challenges in Tanzania's efforts to eliminate iodine deficiency (*Vincent D et al*)
- IHI, Ifakara-kiViA and KiAne.
- Toregeldy Sharmanov Kazakh Academy of Nutrition-Food Fortification as Part of the Integrated Food and Nutrition Strategy in Central Asia