MODULE VIII

Nutrition and Malnutrition in Humanitarian Emergencies
NUTRITION IN HUMANITARIAN EMERGENCIES

• **Need:** Adequate nutritional status
  – Protects from acute food deprivation
  – Improved pregnancy and newborn outcomes

• **Avoid:** Malnutrition
  – ↑ Impaired host defenses
  – ↓ Wound healing
  – Loss of compensatory mechanisms
VULNERABLE GROUPS

- Children < 5 y
- Children removed from their family or community
- Pregnant or lactating women
- Families supported only by women
- Physically or emotionally disabled
- Chronic disease
- Elders
ANTHROPOMETRIC EVALUATION

• Size, weight, and proportions, compared to normal standards

• Systematically collected data in a community characterize overall nutritional status

• Data from children < 5 years reflect the nutritional status of the community
MOST FREQUENT ANTHROPOMETRIC MEASURES

- Weight for age
- Weight for height
- Height for age
- Body mass index (BMI)
- Mid-upper arm circumference (MUAC)
BMI

CHILDREN AND ADOLESCENTS

PERCENTILE

< 5<sup>o</sup>  Underweight

5<sup>o</sup>-85<sup>o</sup>  Normal range

85<sup>o</sup>-95<sup>o</sup>  Overweight risk

>95<sup>o</sup>  Overweight
RISKS AND VULNERABILITIES

• Risks:
  – Death
  – Disease
  – Disability

• Vulnerabilities:
  – Shortage of food
  – Quality of food
  – Access to food
  – Right food
CONSEQUENCES OF MALNUTRITION IN DISASTER SITUATIONS

- Increase diseases incidence
- Delayed wound healing
- Growth retardation: physical/mental
- Immunity impairment
- Still birth
- Congenital anomalies
DISORDERS

- Macronutrient
- Micronutrient
- Multiple nutrient deficiency
MICRONUTRIENT DEFICIENCIES

- Vitamin A
- Iron
- Zinc
- Niacin
- Thiamin
- Vitamin C
- Riboflavin
- Vitamin D
- Calcium
DIETARY FACTORS

MICRONUTRIENT DEFICIENCIES

- Niacin (pellagra): maize-based diet
- Thiamin (beri-beri): polished rice-based diet
- Vitamin A: lack of fresh fruits and green leaf vegetables
- Vitamin C (scurvy): lack of fresh fruits
- Zinc: lack of animal products
- Riboflavin: lack of animal products
- Vitamin D (rickets): poor sunlight exposure
- Calcium: lack of dairy products, green leaf vegetables, bony fish
PHYSICAL FINDINGS ASSOCIATED TO SPECIFIC DEFICIENCIES

- Hair: zinc, biotin, essential fatty acids
- Eyes: vitamins B6, B12, A
- Mouth: niacin, riboflavin, pyridoxine (vitamin B6)
  - Tongue: B complex, iron
  - Gums: vitamin C
  - Teeth: fluoride and vitamin C
PRIORITIES IN HUMANITARIAN EMERGENCIES

• Vitamin A deficiency

• Iron deficiency

• Protein energy malnutrition
VITAMIN A DEFICIENCY

- Worldwide epidemics: 127M preschool children; 20M women
- $\approx 2M$ annual deaths in early childhood; particularly associated with measles
- Vitamin A supplementation is associated with up to 35% reduction in child mortality, and almost total eradication of blindness, in developing countries
VITAMIN A DEFICIENCY
CLINICAL FINDINGS

• Eyes
  – Dryness (xerophthalmia)
  – Night blindness
  – Conjunctival xerosis
  – Bitot`s spots
  – Keratomalacia

• Impaired hematopoiesis and immune function
EFFECTS OF VITAMIN A DEFICIENCY

- Xerophthalmia
- Bitot’s spot
- Corneal ulceration
EFFECTS OF VITAMIN A DEFICIENCY
VITAMIN A INTERVENTIONS

• Give supplements to children 6 mo-5 years

• Treat all symptomatic individuals

• Repeat every 3-6 months, if adequate intake is not provided by available food resources

• Distribute fortified food
IRON DEFICIENCY

• Most common nutritional deficiency worldwide
• Mostly children and women
• Most frequent cause of anemia
ANEMIA: RISK FACTORS

- Diet lacking animal products
- Pregnancy
- Prematurity, low birth weight, premature cord clamping
- Accelerated growth
- Animal milk use
- Impaired absorption due to high phytates and phosphates in diet
- Menstruation
- Intestinal parasites
ANEMIA: CLINICAL IMPACT

- Impaired development
- Increased morbidity associated with infections
- Decreased physical activity, productivity, attention span
- Increased mortality (severe anemia)
CLINICAL FINDINGS: SEVERE ANEMIA

- Pale skin, mucous membranes, nail beds
- Resting dyspnea and tachypnea
- Laboratory: ↓ hemoglobin and/or hematocrit
IRON DEFICIENCY PROPHYLAXIS

• Full-term infants: exclusive breast-feeding 6 months
• Premature infants: early iron supplementation
• Iron supplementation
  – Breast-fed infants: after 6 months of age
  – Formula-fed infants: after 4 months of age

If at risk, give antihelmintics to population over 2 years old
ZINC
DEFICIENCY AND SUPPLEMENT

Impaired cell life, function, growth, differentiation, and replication

Recommended daily allowances:
• Infants: 5 mg
• Young children: 10 mg
• Women: 12 mg
MALNUTRITION

Protein energy malnutrition
TYPES OF MALNUTRITION

kwashiorkor

marasmus
TYPES OF MALNUTRITION
MARASMUS

- Most frequent in < 1 y
- Marked emaciation
- Apathy; irritability
- Marked loss of subcutaneous fat
- ↓ weight > 20%
- Appetite preserved
TYPES OF MALNUTRITION

KWASHIORKOR

- Edema
- Enlarged liver and spleen
- Water and electrolyte shifts
- Loss of appetite
- Skin and hair (discoloration) changes
INITIAL NEEDS ASSESSMENT

- Prevalence of malnutrition and micronutrient deficiencies
- Active nutritional programs in the community
- Identification of vulnerable groups
- Quantity and quality of readily available food resources
ASSESSMENT DURING RECOVERY PHASE

- Periodic reassessments until adequate nutritional resources are sustainable
- Quality and security of available nutritional resources
- Systematic assessment of nutritional status
- Target vulnerable groups
MANAGEMENT OF MICRONUTRIENT DEFICIENCY: RISK REDUCTION

- Assess prevalence of pre-existing deficiencies
- Assess usual food resources (potential pre-existing deficiencies)
- Estimate current risk
- Identify symptomatic individuals and treat them
- Periodic assessment (particularly high risk populations)
Global food fortification
Supplement high risk individuals
Diversify diet
Nutritional education
Supervise food rations
Improve sanitation status
CASE MANAGEMENT: FEEDING PROGRAMS

- General feeding program
- Supplementary feeding
- Therapeutic feeding
GENERAL FEEDING PROGRAM

Types

• Wet rations

• Dry rations
SUPPLEMENTARY FEEDING PROGRAM

• Mild/moderate malnutrition
• Nutritional support
• Provide intake required for recovery and catch-up growth
• Feedings according to individual requirements
• Proteins 3-5g/kg/day
THERAPEUTIC FEEDING

Identify children with severe malnutrition:

- MUAC < 110 mm
- W/H < 70%
- W/H Z Score < -3
- Clinical edema
THERAPEUTIC FEEDING

PHASE 1

- Hospitalized patient (recommended)
- Initial stabilization
- Fluids: oral; IV only for severe dehydration and/or shock
- Progressive increase of calories and volume in 1-2 weeks
- Oral feeding; alternatively NGT
- Frequent feedings
- Treat associated disorders (infection)
- Iron supplements are contraindicated
THERAPEUTIC FEEDING
PHASE 2

• Continue medical treatment

• Initiate nutritional rehabilitation: 4-6 feedings/day; >200 kcal/kg/day

• Transition to social environment

• Vary diet, incorporate age-appropriate local foods, provide psychosocial stimulation

• Progress to supplementary feeding program when W/H is at least at 80% for at least 2 weeks, with no edema or severe medical problems
REFEEDING SYNDROME

• Most frequent with Kwashiorkor
• Malnutrition results in functional redistribution of proteins, acidosis, and fluid and electrolyte shifts
• Rehydration and refeeding causes a rapid return to glucose as primary energy source

Aggressive delivery of fluids and food can cause circulatory overload with hemodynamic failure, and hypothermia, hypoglycemia, hypokalemia, and hypophosphatemia, associated with increased morbidity and mortality.
REFEEDING SYNDROME
THERAPEUTIC PLAN

• Cautious and progressive; close clinical monitoring

• IV fluid therapy only in patients with shock

• Additional phosphorus, potassium, magnesium, thiamine, and glucose

• Treat infections and associated micronutrient deficiencies
WEIGHT LOSS

• Newborn: normal 10% of birth weight in the first week of life

• Greater loss after 7 days $\rightarrow$ severe nutrition problem $\rightarrow$ hospitalization

• Feeding problems
INFANT AND YOUNG CHILD FEEDING

• Promote exclusive breast-feeding for infants < 6 months, and continued breast-feeding for children 6-24 mo (WHO) supplemented with adequate complementary foods

• Provide adequate nutrition to lactating mothers

• Supplement feeding with formula or animal milk is not recommended

• Artificial feeding requires increased use of limited resources (water, fuel)
ASSESSMENT OF APPROPRIATE BREAST-FEEDING TECHNIQUE

Position

• Infant’s head and body are straight

• Infant’s head directed to the mother’s breast

• Infant’s body close to the mother’s body (belly against belly)

• Mother holds the whole body of the infant, not only shoulders and neck
ASSESSMENT OF APPROPRIATE BREAST-FEEDING TECHNIQUE

• Grip
  – Mouth widely open
  – Chin touches breast
  – Lower lip placed under the nipple
  – Upper side of the areola more visible than lower side
FOOD SECURITY VS FOOD BASKET

- Access to food
- Right food – 1900 Kcal/day
- Quality of food
- Culture and norms of society
- Behavioral attention
- Sustainability of supply
IDENTIFY COMMUNITY RESOURCES
FOOD MUST BE ACCEPTED BY COMMUNITY
THANK YOU!