Protein-Energy Malnutrition

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Overview

- Definition
- Localization
- Kwashiorkor
- Marasmus
- Complications
- Treatment and prevention
- Initial “refeeding”
Definition

• Form of malnutrition (undernutrition)

• Micronutrient deficiency

• Children 6 months to 5 years

• Result from
  - Lack of food
  - Infections with loss of appetite
Localization

• In many developing countries: Africa +++

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Types of PEM

- **Kwashiorkor:**
  - Insufficient protein consumption
  - Child weaned: mother’s milk to starchy vegetables

- **Marasmus**
  - Energy deficiency

- **Marasmic-Kwashiorkor**
  - Deficiency of both calories and protein
Kwashiokor

- Weight loss:
  - arms and legs
  - decrease of muscle mass

- Swollen abdomen
  - ascites: increase of capillary permeability
  - enlarged liver: fatty liver

- Peripheral oedema: decrease of oncotic pressure

- Anemia: lethargy

- Hair and skin changes
Marasmus

- Weight loss: “skin and bones”
- Prominent of ribs
- Drastic loss of adipose tissue
- Growth retardation
- Chronic diarrhea
- Muscle atrophy
- Skin folds
- “old man” face
Complications of PEM

- Hypoglycemia
- Hypothermia
- Dehydration and shock
- Electrolyte imbalance
  - hypokalemia
  - hyponatremia
- Infections (bacterial, viral and thrush)
- Micronutrient deficiencies
Treatment and prevention

- Correction of water and electrolyte balance
- Treat infection and worm infestations
- Dietary support
  - 3-4g protein and 200 cal/kg body weight/day
  - Vitamins and minerals
- Prevention of hypothermia
- Counsel parents and plan future including immunization and diet supplements
Initial “refeeding”

- Continue breast feeding
- Add frequent small feeds
- Use liquid diet
- Give vitamin A and folic acid on admission
- With diarrhea use lactose-free or soya bean formula
Take home message

• Protein-energy malnutrition = undernutrition

• +++ in developing countries

• 2 types of PEM
  - Kwashiorkor: protein deficiency + oedema
  - Marasmus: calories deficiency

• Interaction PEM / infection major cause of death

• Treatment:
  - progressive “refeeding”
  - treatment of infections
Bibliography

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