The Child with Failure to Thrive

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DISCLOSURES

None of the planners or presenters of this session have disclosed any conflict or commercial interest.
The Child with Failure to Thrive

OBJECTIVES:

1. Review assessment and appropriate diagnostic testing for children who fail to meet expected growth
2. Discuss various causes of failure to thrive.
3. Identify appropriate referrals for children with failure to thrive.
Definition

• Inadequate physical growth diagnosed by observation of growth over time on a standard growth chart
Definition

• More than 2 standard deviations below mean for age

• Downward trend in growth crossing 2 major percentiles in a short time

• Comparison of height and weight

• Not a diagnosis but a finding
Pitfalls

• Some children are just tiny

• Familial short stature children may cross percentiles to follow genetic predisposition

• Normal small children may be diagnosed later given already tiny
Frequency

- Affects 5-10% of children under 5 in developing countries

- Peak incidence between 9 and 24 months of age

- Uncommon after the age of 5
What is normal growth

- Birth to 6 months, a baby may grow 1/2 to 1 inch (about 1.5 to 2.5 centimeters) a month
- 6 to 12 months, a baby may grow 3/8 inch (about 1 centimeter) a month
- 2nd year of life 4-6 inches
- 3rd year 3-4 inches
- Annual growth until pre-puberty 2-3 inches per year
Normal weight gain

• Birth to 6 months - gain 5 to 7 ounces a week.

• 6 to 12 months - gain 3 to 5 ounces (about 85 to 140 grams) a week.

• Ages 1 and 2, a toddler will gain only about 5 pounds.

• Weight gain will remain at about 5 pounds per year between ages 2 - 5.
Calories for growth

• Average calories from infants are 115 kcal/kg

• Average calories for ages 1-3 are 95 kcal/kg
  (1000-1400 calories per day)

• Average calories 4-8 are 1200-1800 per day
Growth curves: CDC vs WHO
Case 1: 16 month old girl
Case 1

- Normal ht/wt but small normal BMI
- Any evaluation
- Follow up – next steps....
Case 2
Case 2

• Seen at 12 months of age with decelerating wt

• Any evaluation or recommendations

• Next steps
Causes of Failure to thrive

• Organic

• Non-organic
Causes of FTT

- Prematurity/IUGR
- Inadequate caloric intake
- Inadequate absorption
- Increased calorie requirement
- Defective utilization of calories
Prematurity

- In utero exposures
- Infections
- IUGR
- Chromosomal abnormalities (Down’s)
Inadequate calorie intake

- Under feeding
- Incorrect formula preparation
- Behavioral issues
- Poverty
- Abuse/neglect
- Feeding difficulties
- Prolonged dyspnea
Inadequate absorption

- Malabsorptive syndrome
- Vitamin deficiency
- Hepatobiliary disease
- Short gut
Increased calorie requirement

- Hyperthyroidism
- Chronic infection
- Chronic anemias
Defective utilization

- Inborn error of metabolism
- Diabetes (Insipidus/mellitus)
- Renal Tubular Acidosis
- Chronic hypoxia
Quick look

• Does the child look small for age
• Is there subcutaneous fat
• Hygiene
• Social skills
• Tone
Nutritional History

• Time of feedings
• Amount of feedings
• Amount of time to complete feeding
• How when solids started
• Food allergies
• Is there force feeding
Medical history

- Prenatal history
- Birth weight
- ENT
- Respiratory
- Cardiovascular
- GI
- GU
- Skin
- Hospitalizations
Family and Social history

- Age/sex of siblings
- Familial short stature
- Parental height and weight
- Home situation
- Psychosocial
Physical Exam

• Four main goals
  – Identify dysmorphic features
  – Detection of underlying disease
  – Assessment for abuse/neglect
  – Assess severity and effects of malnutrition
Physical Exam cont.

• Assess degree of FTT
  – Ht/wt, ht, wt, head circumference
• Developmental assessment
• Skin – pale, eczema, rash
• HEENT – hair loss, chronic infection, thyroid
• Chest – wheezes
Physical Exam cont.

• CV – murmur, pulses
• Abd – distended, bowel sounds, HSM
• Extremities – clubbing, muscle mass
• Neuro – developmental delay, dysphagia, muscle tone and deep tendon reflexes
• Behavior – difficult to feed/oral aversion
Assessing degree of FTT

<table>
<thead>
<tr>
<th>Growth parameter</th>
<th>Degree of Failure to Thrive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mild</td>
</tr>
<tr>
<td>Weight</td>
<td>75-90%</td>
</tr>
<tr>
<td>Height</td>
<td>90-95%</td>
</tr>
<tr>
<td>Weight/height ratio</td>
<td>81-90%</td>
</tr>
</tbody>
</table>

Adapted from Baucher H.³
Lab Evaluation

- CBC
- Esr
- Tsh/Free T4
- TTg, Iga, Gliadin antibodies
- CMP
Lab evaluation

• Urinalysis
• Stool studies
• Do Not Go On Fishing Expedition
Other Evaluation

• Quantitative diet history

• ? Hospitalization
Other Growth to Consider

- Familial short stature
- Constitutional growth delay
- Early onset growth delay
- Diencephalic syndrome
Case 3
Case 3

Height-for-age Percentiles (Girls, 2 to 5 years)

Mid-parental height: 159.9 cm (62.5 in)
Case 3

• Short stature – normal weight

• Differential diagnosis –

• Any next steps??
Management

• Diet plan

• Formula for catch up growth

\[ \text{Kcal for weight} \times \text{ideal body weight} \]
\[ \text{Actual weight} \]
**TABLE 6. Acceptable weight gain per day according to age.**

<table>
<thead>
<tr>
<th>Age (months)</th>
<th>Weight gain (g/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth to &lt;3</td>
<td>20 – 30</td>
</tr>
<tr>
<td>3 to &lt;6</td>
<td>15 – 22</td>
</tr>
<tr>
<td>6 to &lt;9</td>
<td>15 – 20</td>
</tr>
<tr>
<td>9 to &lt;12</td>
<td>6 – 11</td>
</tr>
<tr>
<td>12 to &lt;18</td>
<td>5 – 8</td>
</tr>
<tr>
<td>18 to 24</td>
<td>3 – 7</td>
</tr>
</tbody>
</table>
Management

- High calorie supplements
- cyproheptadine
Follow up

- Infants – weekly
- Toddlers/preschool 2-4 weeks
- Referral out if not improving
Any Questions??