Approach to short stature

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Short Stature

Height below 3rd centile or more than 2 standard deviations below the median height for age & sex
Causes of Short Stature

Physiological:
- Familial
- Constitutional

Pathological:
- Undernutrition
- Chronic systemic diseases
- Endocrine Causes
- Psychosocial dwarfism
- SGA babies
- Skeletal dysplasias
- Genetic syndromes
Assessment of child with Short Stature

- Accurate height assessment
- Assessment of body proportions
- Assessment of height velocity
- Comparison with population norms
- Comparison with child’s own genetic potential
- Sexual maturity rating
## Evaluation

<table>
<thead>
<tr>
<th>History</th>
<th>Etiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>LBW</td>
<td>SGA</td>
</tr>
<tr>
<td>Polyuria</td>
<td>CRF, RTA</td>
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<tr>
<td>Chronic Diarrhoea</td>
<td>Malabsorption</td>
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<tr>
<td>Neonatal hypoglycemia/Micropenis/Jaundice</td>
<td>GH deficiency</td>
</tr>
<tr>
<td>Headache/Vomiting/Visual problem</td>
<td>ICSOL</td>
</tr>
<tr>
<td>Lethargy/Constipation/Weight gain</td>
<td>Hypothyroidism</td>
</tr>
<tr>
<td>Dietary intake</td>
<td>Undernutrition</td>
</tr>
<tr>
<td>Social History</td>
<td>Psychosocial dwarfism</td>
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<tr>
<td>Delayed puberty in parents</td>
<td>Constitutional delay</td>
</tr>
<tr>
<td>Findings</td>
<td>Etiology</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------------------------------------</td>
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<tr>
<td>Body disproportion</td>
<td>Skeletal dysplasia/Rickets</td>
</tr>
<tr>
<td>Pallor</td>
<td>CRF</td>
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<tr>
<td>Dysmorphism</td>
<td>Genetic syndromes</td>
</tr>
<tr>
<td>Hypertension</td>
<td>CRF</td>
</tr>
<tr>
<td>Frontal bossing, depressed nasal bridge, crowded teeth, small penis</td>
<td>GHD</td>
</tr>
<tr>
<td>Goiter/coarse skin</td>
<td>Hypothyroidism</td>
</tr>
<tr>
<td>Central obesity/Striae</td>
<td>Cushing Syndrome</td>
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</tbody>
</table>
Investigations

Level One:
- Complete Hmg with ESR
- Bone Age
- Urinalysis
- Stool examination
- RFT
- LFT
- FBS
Investigations cont.....

Level Two:

- TFT
- Karyotyping

Level Three:

- Celiac serology
- GH stimulation tests
Bone Age

- Usually BA < CA
- Exceptions: Familial short stature, Precocious puberty
- BA = HA: Constitutional delay, Undernutrition, Systemic illness
- BA < HA: GHD, Hypothyroidism
Familial Short Stature

- Normal height & weight at birth
- Catch down in growth
- By 2 years, height & weight lies on target centile
- Growth velocity normal
- Bone age = chronological age
- Normal puberty
- Final height low but within target range
Constitutional Short Stature

- Normal length & weight at birth
- Normal growth till 6-12 months
- Deceleration till 2-3 yrs
- Height velocity accelerates & grow parallel to 3rd percentile
- Normal height velocity
- Delayed puberty
- Final height normal
- Bone age < Chronological age
- Bone age = Height Age
- Family history of delayed puberty
## Constitutional Vs Familial

<table>
<thead>
<tr>
<th>Feature</th>
<th>Constitutional</th>
<th>Familial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>Short</td>
<td>Short</td>
</tr>
<tr>
<td>Height velocity</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Family history</td>
<td>Of delayed puberty</td>
<td>Of short stature</td>
</tr>
<tr>
<td>Bone age</td>
<td>Less than chronological age</td>
<td>Normal</td>
</tr>
<tr>
<td>Puberty</td>
<td>Delayed</td>
<td>Normal</td>
</tr>
<tr>
<td>Final height</td>
<td>Normal</td>
<td>Low but normal for target height</td>
</tr>
</tbody>
</table>
Psychological Dwarfism

- Emotional deprivation dwarfism/ Maternal deprivation dwarfism/ Hyperphagic short stature
- Functional hypopituitarism
- Low IGF-1 levels & inadequate response to GH
- Good catch up growth in less stressful environment
Management

- Counselling of parents
- Dietary advice
- Treatment of underlying medical condition
- Regular monitoring
Failure to Thrive

- Physical growth significantly less than peers
- Used for children < 5 years of age
- Includes: Wt < 3rd percentile
  - Failure to gain weight
  - Crossing of 2 major percentiles
Etiology

Organic:

- GI
- CNS
- Renal
- Cardiopulmonary
- Endocrine
- Infections
- Genetic
Etiology cont...

Non organic:

- Poverty
- Faulty diet
- Psychosocial
Thank You