Benign paroxysmal vertigo of childhood (BPVC)

Epidemiology of BPVC
• Estimated prevalence = up to 2%
• Most common cause of vertigo in children aged 2-6
• Considered migraine antecedent
  • FHx migraine also common
• Association w motion sickness

Clinical features of BPVC
• Recurrent episodes of brief disequilibrium, characterised by:
  • Child appearing frightened
  • Grabbing nearby person or furniture
  • Episode usually lasts <1 minute
• May be associated with:
  • Pallor
  • Nystagmus
  • Diaphoresis
  • N+V
  • No altered consciousness or auditory Sx
  • Imbalance persists for minutes-hours following an attack
  • Episodes usually recur in clusters
    • Daily for several days
    • Remission for several weeks

Clinical features of BPVC
• Neurological exam, audiological exam, EEG + MRI are normal in-between attacks
• Pathophysiology unknown - ? transient vascular disorder
• Diagnosis of exclusion
  • Major DDx: seizure, BPPV
  • No specific lab tests
  • Dx based on thorough history + normal examination findings

Prognosis
• No treatment required, except reassurance
• Commonly resolves by 5 y.o, or within 3 years of onset
• >50% go on to develop classic migraine
BPVC vs. BPPV
- BPPV pathophysiology is well known: calcium crystals/otoliths lodge in the posterior semicircular canal > abnormal displacement of endolymph
- BPPV is rare in children
- Clinical features of note:
  - Vertigo is positional, lasting 10-20s
  - Accompanied by rotational nystagmus
  - Positive Dix-Hallpike test
  - Easily treated with Epley maneuver

Insulinoma
- Pancreatic islet cell tumour
- Thought to arise from ductular/acinar cells rather than neoplastic islet cell proliferation
- Rare; ~4/100,000/yr
- Limited data
- Median age of presentation ~50yrs
- May be sporadic or associated with MEN1 syndrome
- Typically solitary and benign, <2cm

DDx
- Persistent hyperinsulinaemic hypoglycaemia of infancy
  - AKA primary islet cell hypertrophy, congenital hyperinsulinaemia, familial hyperinsulinism
- Noninsulinoma pancreaticotogenous hypoglycaemia syndrome
- Sulfonylurea-induced hypoglycaemia
- Insulin autoimmune hypoglycaemia

Clinical features
- Fasting hypoglycaemia
  - +/- neuroglycopenic symptoms
    - Visual changes, confusion, unusual behaviour
  - +/- sympathoadrenal symptoms
    - Diaphoresis, tremors, palpitations
  - Hypoglycaemia secondary to decreased hepatic glucose output

Diagnosis
- High serum insulin during hypoglycaemic episode
- Imaging
  - Can be difficult to localise tumour
  - Abdo USS initially then PET/MRI for staging and surgical planning
Management - Primary
- Medical
  • Dextrose
  • Diazoxide
- Surgical
  • Laparoscopic v. open
  • Partial/total pancreatectomy
  • Enucleation of insulinoma

Management - Metastases
- Liver and lymph nodes most common site for metastatic disease
  • Resection
  • Hepatic artery embolization
  • RFA ablation and cryoablation
- Chemo
  • Streptoxocin + doxorubicin or temozolomide
  • Efficacy unclear
  • New molecularly targeted therapy

Viral thyroiditis in children
- Self limiting triphasic disease
- De Quervains: Subacute granulomatous thyroiditis – rare in children.

Three major phases
- Hyperthyroid
  • Destruction of follicles → release of PREFORMED thyroid hormone
  • Lasts 4-10 weeks
- Hypothyroid
  • Depleted stocks of hormone rebuilt
  • Up to 2 months
- Euthyroid remission: 90-95%

TFTs

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
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<tbody>
<tr>
<td>Symptoms</td>
<td>Hyperthyroid</td>
<td>Euthyroid</td>
<td>Hypothyroid</td>
<td>Euthyroid (recovery)</td>
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<td>Elevated</td>
<td>Normal</td>
<td>Decreased</td>
<td>Normal</td>
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<tr>
<td>TSH</td>
<td>Decreased</td>
<td>Normal</td>
<td>Elevated</td>
<td>Normal</td>
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Presentation of viral thyroiditis
- Seek viral precedent, but often none can be reliably identified.
- Frequently present with anterior neck pain
- Non-specific fever, malaise, anorexia.
- Thyrotoxic symptoms: tachycardia, frequent bowel actions, tremor, heat intolerance/warm feeling.
Atypical presentations

• Case reports known of PAINLESS subacute granulomatous thyroiditis
• “Prominent prostration and confusion lasting several weeks”
• Fever of unknown origin

ATYPICAL subacute thyroiditis

• 9 patients with painless or minimally painful subacute thyroiditis.
• 6 antecedent viral symptoms.
• TPO antibodies negative in 8
• No family history
• Represent postviral painless subacute thyroiditis (atypical subacute thyroiditis).

ATYPICAL viral thyroiditis has been documented in children:

• Laboratory proven EBV causing painless atypical thyroiditis with typical features of hyperthyroidism normalising over time in a 3 year old girl.
(Also case reports of HIV inducing typical subacute thyroiditis).

Case reports linking thyroiditis and psychiatric symptoms

• Well documented in thyroid related encephalopathy – eg Steroid responsive encephalopathy associated with Hashimotos thyroiditis.
  • Usually presents with MRI changes.
    • Pediatrics Vol. 112 No. 3 September 1, 2003 pp. 686-490
  • Thyrotoxicosis well documented as an organic cause for adult delirium/psychosis.

Psychiatric features in young children are different:

Frank psychiatric symptoms in thyrotoxicosis in around 10% of cases.
Psychiatric picture may predate physical features/diagnosis by 6-12 months
Classic picture is of school performance deterioration.
Common symptoms are hyperactivity, irritability or anxious dysphoria, and problems of attention.


Behaviour change prominent:

• “Neuropsychiatric manifestations such as hyperkinesis, irritability, excitability, and behavioural problems were the most common presenting symptoms (90%) of hyperthyroidism.”
  • Menon et al. Journal of Pediatric Endocrinology and Metabolism. 1996, Volume 19, Issue 4, Pages 441–446,
Reversible:

- Case report 3 children with ADHD, autism-like features, hyperkinetic activity.
- No systemic signs of hyperthyroidism.
- Hyperthyroid on TFTs
- Significant improvement with commencement of neomercazole.

Conclusions:

- Subacute thyroiditis can present rarely without pain after viral illness.
- Behavioural change is an early marker of thyroid disease in children, especially declining school performance or new hyperactivity.
- Treatment can modify or reverse symptoms.

Resources:

- Medscape: Pediatric thyroiditis, accessed 26/2/15