Neonatal thyrotoxicosis: a case series  
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Introduction  
Neonatal thyrotoxicosis is a rare and life-threatening condition caused by transplacental transfer of maternal thyroid stimulating immunoglobulins in mothers with autoimmune thyroid disease1.

Clinical features of neonatal thyrotoxicosis include tachycardia, goitre, prominent eyes and poor weight gain2.

Presenting symptoms may be non-specific, particularly in the premature or intrauterine growth retarded infant and clinical features may mimic other conditions such as neonatal sepsis3.

Early diagnosis and treatment of affected infants is critical

Methods  
We report 4 cases of neonatal thyrotoxicosis occuring in two tertiary paediatric hospitals. Information on maternal thyroid disease, perinatal history, clinical features, diagnostic testing and management of infants is presented

Clinical features  
Infants  
2 females and 2 male infants. 
Mean gestational age was 36 weeks 
Mean birthweight was 3.14kg 
Mean age at diagnosis was 6 days (range 2 to 10 days) 
Mean serum thyroxine at diagnosis was 53.5pmol/L (range 35.0-77.0pmol/L)

Mothers  
4 of 4 infants had a maternal history of Graves’ disease. 
3 of 4 mothers required antithyroid medications during their pregnancy 
3 out of 4 mothers had positive TRAB antibodies

On clinical examination 
All infants had tachycardia 
2 of 4 infants had significant weight loss and failure to thrive 
No infant had eye signs or goitre

Diagnosis  
The diagnosis of neonatal thyrotoxicosis was confirmed with thyroid function testing and measuring thyroid receptor binding antibodies (TRAB) levels

<table>
<thead>
<tr>
<th>Case</th>
<th>Age at diagnosis</th>
<th>T4 (pmol/L)</th>
<th>TSH (mU/L)</th>
<th>TRAB</th>
<th>Thyroid US</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10 days</td>
<td>35</td>
<td>&lt;0.01</td>
<td>Positive</td>
<td>Not performed</td>
</tr>
<tr>
<td>3</td>
<td>9 days</td>
<td>&gt;77</td>
<td>2</td>
<td>Positive</td>
<td>Not performed</td>
</tr>
<tr>
<td>3</td>
<td>2 days</td>
<td>40</td>
<td>&lt;0.01</td>
<td>Positive</td>
<td>Normal</td>
</tr>
<tr>
<td>4</td>
<td>3 days</td>
<td>62</td>
<td>&lt;0.01</td>
<td>Positive</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Treatment and follow up  
All infants were treated with anti-thyroid drugs for a mean of 10 weeks. 2 infants required thyroxine replacement during therapy

<table>
<thead>
<tr>
<th>Case</th>
<th>Agent used</th>
<th>Duration of therapy</th>
<th>Thyroxine replacement required during treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Carbimazole</td>
<td>6 weeks</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Propylthiouracil</td>
<td>6 months</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Carbimazole</td>
<td>4 weeks</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Carbimazole</td>
<td>9 weeks</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Take home messages  
• Neonatal thyrotoxicosis is a rare condition affecting 2-3% pregnant women with Graves’ disease  
• The most important maternal risk factors are elevated maternal TRAB titres in pregnancy and need for maternal anti-thyroid medication.  
• Classic features such as goitre and prominent eyes may be absent.  
• In high risk infants, isolated tachycardia must alert the physician to the possibility of neonatal thyrotoxicosis  
• Follow up is essential to ensure normal thyroid function, growth and developmental outcomes

References  