hCG Stimulation Test


Indication

- In the infant with ambiguous genitalia and palpable gonads
- In male delayed puberty and/or undescended testes
- To confirm the presence of active testicular tissue

Male newborn infants usually have plasma testosterone concentrations within the low adult range (8-12 nmol/L) and both LH and testosterone are at adult values during the third and fourth months. If blood can be obtained during these times, an hCG test may be avoided.

Contraindication

Principle

hCG is a double polypeptide hormone and shares a common subunit with LH. It stimulates testicular Leydig cells to secrete androgens via the LH receptors. A single injection of hCG is adequate as it has a long half life (2.5 days) and produces a progressive but modest rise in plasma testosterone for 72-120 hours.

Side effects

Headaches, tiredness.

Preparation

No patient preparation is required

Requirements

1. 1 vial hCG 1500 units for infants or 5000 units for children over 2 years
2. 2 plain tubes

Procedure

1. Day 0: take blood for testosterone, androstenedione and dihydrotestosterone
2. Administer 1500 units (infants) or 5000 units (over 2 years) hCG subcutaneously or i.m.
3. Day 4: take blood for testosterone, androstenedione and dihydrotestosterone

Interpretation: PLEASE DISCUSS ALL RESULTS WITH PAEDIATRIC ENDOCRINOLOGY

<table>
<thead>
<tr>
<th></th>
<th>testosterone</th>
<th>DHT</th>
<th>T/DHT ratio after hCG</th>
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</thead>
<tbody>
<tr>
<td>Normal male adults</td>
<td>8-27 nmol/L</td>
<td>&lt; 2.9 nmol/L</td>
<td>&lt; 12</td>
</tr>
<tr>
<td>Normal children (6 months - puberty)</td>
<td>&lt; 0.9 nmol/L</td>
<td>&lt; 0.1 nmol/L</td>
<td>&lt; 10</td>
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<tr>
<td>5 a-reductase (6 months - puberty)</td>
<td>&lt; 0.5 nmol/L</td>
<td></td>
<td>&gt; 10</td>
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</table>

1. There is a 2-9 fold increase in testosterone in normal prepubertal boys. In the absence of testes, no response in testosterone occurs.
2. Normal males show a complex pattern of testosterone. In the first week there is a modestly elevated testosterone concentration due to gonadal stimulation by maternal hCG. During months 2-6 of age, testosterone should reach the lower end of the adult range associated with adult gonadotrophins (LH>FSH). Thereafter testosterone become undetectable until the onset of puberty.
3. There are reported errors in the interpretation of the hCG stimulation test in boys of approx 8 years with increased T:DHT ratios in the 5a-reductase range.
References