Genetic influences on testosterone levels in early puberty

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**Aim**

To estimate genetic and environmental influences on variation in salivary testosterone (T) levels in 12-year old children.

**Methods**

**Subjects:**
183 unselected twin pairs, boys and girls, 12 years of age.

**Data collection:**
- Midday saliva collection in plastic devices by passive drool on two consecutive days
- Salivary testosterone reflects the unbound (physiologically active) form of the hormone
- Testosterone analyzed using radioimmunoassay

**Genetic modeling:**
- Univariate ADE model using mean T concentration averaged over two samples.
- Test for sex differences

**Results**

<table>
<thead>
<tr>
<th></th>
<th>N*</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>♂ s1</td>
<td>140</td>
<td>71.57 (23.25)</td>
</tr>
<tr>
<td>♂ s2</td>
<td>134</td>
<td>70.67 (24.23)</td>
</tr>
<tr>
<td>♀ s1</td>
<td>145</td>
<td>85.39 (29.85)</td>
</tr>
<tr>
<td>♀ s2</td>
<td>145</td>
<td>81.25 (28.07)</td>
</tr>
</tbody>
</table>

* Number of children in the study

- T level higher in girls compared to boys, consistent with their earlier onset of puberty
- No differences in T levels between same sex DZ twin girls and girls from a DOS twin pair → no evidence for effect male co-twin on postnatal T-levels in DOS-girls
- Genetic influences (A) could explain 68% of the variation in both boys and girls. The remaining proportion, 32%, was accounted for by non-shared environmental influences (E).

**Discussion**

Previous research (Harris et al., 1998) indicated marked sex difference in heritability of T levels in 14-21 year olds. Also, they found no correlation between adolescent twins and their parents, suggesting that different genetic mechanisms influence T concentrations across the life span. The results of our study indicate that in pre- and early puberty sex differences in gene expression for T concentration have not yet developed.