Raised concentrations of C reactive protein in anabolic steroid using bodybuilders

F M Grace, B Davies

Objectives: To examine levels of C reactive protein in users of anabolic androgenic steroids (AAS) compared with age matched control groups consisting of AAS using (but abstinent)/resistance trained and non-drug using/sedentary controls.

Method: Subjects included AAS using bodybuilders (n = 10); bodybuilders who denied AAS use (n = 10); sedentary controls (n = 8). Venous blood was sampled, from which serum concentrations of C reactive protein, male sex hormones, and cardiac troponin T were determined.

Results: A significantly altered hormonal profile in the AAS using group provided indirect confirmation of AAS use. C reactive protein concentrations were significantly (p < 0.05) higher in the AAS using bodybuilders. There was no relation between C reactive protein and cardiac troponin T.

Conclusion: AAS using bodybuilders had significantly higher C reactive protein concentrations, indicating a greater propensity to develop peripheral arterial disease.

TABLE 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>AAS users (n = 10)</th>
<th>Bodybuilding controls (n = 10)</th>
<th>Sedentary controls (n = 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testosterone (nmol/l)</td>
<td>41 (26.1)*</td>
<td>17 (3.7)</td>
<td>15 (3.00)</td>
</tr>
<tr>
<td>SHBG (nmol/l)</td>
<td>4.0 (2.8)**</td>
<td>13 (8.4)</td>
<td>21 (11.1)</td>
</tr>
<tr>
<td>Free androgen index</td>
<td>10.2***</td>
<td>13</td>
<td>1.3</td>
</tr>
<tr>
<td>CRP (mmol/l)</td>
<td>1.2 (0.5)*</td>
<td>0.7 (0.3)</td>
<td>0.5 (0.2)</td>
</tr>
<tr>
<td>Troponin T (nmol/l)</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
</tr>
</tbody>
</table>

Values are mean (SD). *p < 0.05; **p < 0.01; ***p < 0.001 compared with both controls. SHBG, Sex hormone binding globulin.

DISCUSSION

The mechanism for AAS induced CRP alterations is not known. An absence of a concurrent increase in troponin T in the AAS using group indicates inflammation at a source other than the myocardium. CRP is secreted by hepatocytes in response to in vivo inflammatory events. Indeed, much biological activity of AAS also centres around the liver. This possible link certainly warrants more detailed investigation.

This study adds to the list of potentially prothrombotic consequences of non-therapeutic AAS use, and provides a contraindication to such use.

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Abbreviations: AAS, anabolic androgenic steroid; CRP, C reactive protein

Take home message

Higher levels of C reactive protein in anabolic androgenic steroid using bodybuilders indicate a greater propensity to develop future thromboembolic events.
REFERENCES


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