Steroid Metabolomic Signature of Liver Disease in Childhood Obesity

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Context

Steroid profile (chromatogram) defines a subject’s steroidal fingerprint.

A cluster of similar steroidal fingerprints related to a disease condition might be regarded as the “steroidal metabolomic disease signature”.

Purpose

Here, we compare the steroidal fingerprints of obese children with or without liver disease to identify the ‘steroidal metabolomic signature’ of childhood non-alcoholic fatty liver disease.

Material & Method

117 consecutive series of obese patients (BMI>97%)

85 patients with non-syndromic obesity (43 girls/F) 14.4 ± 2.3yrs (8.5-18 yrs)

Clinical / Chemical Phenotype: age; sex; BMI, z-score BMI (IOTF); ALT (s); abdomen US (hepatic steatosis features)

Liver disease (L1) - 22 patients (7F/22M)

as assessed by sonographic steatosis (S+)

and/or elevated liver enzymes (ALT+)

14.4 years

2.82

N

no liver disease (L0) – 63 patients (36F/27M)

no sonographic steatosis (S-)

and no elevated liver enzymes (ALT-)

14.1 years

2.67

Steroidal “fingerprint”: samples from 24-h urinary collection

31 steroidal metabolites were quantified by gas chromatography-mass spectrometry (GC-MS)

Quantities were z-transformed based on sex & age

The steroidal signature of the liver disease was generated as a difference of median profiles of L1 and L0 groups

Sterylol signature of liver disease in childhood obesity

L1 was characterized by high glucocorticoids and low androgens

Results

Table: Urinary steroid metabolites comparison p

<table>
<thead>
<tr>
<th>Urinary steroid metabolites</th>
<th>comparison</th>
<th>p</th>
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<tbody>
<tr>
<td>(THF+αTHF)/PT</td>
<td>L1 &gt; L0</td>
<td>0.029</td>
</tr>
<tr>
<td>(THF+αTHF)/THE</td>
<td>L1 &lt; L0</td>
<td>0.01</td>
</tr>
<tr>
<td>α-cortolone</td>
<td>ALT+ &gt; L0 or S+</td>
<td>0.03</td>
</tr>
<tr>
<td>An/ET</td>
<td>ALT+ &gt; ALT-</td>
<td>0.001</td>
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