METABOLOMICS IN EARLY LIFE AND ASSOCIATION WITH BODY COMPOSITION AT AGE 2 YEARS

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BACKGROUND

Early life ≈ critical window for adiposity programming

Metabolic profile might contribute to adiposity programming

AIM

Is metabolic profile at age 3 months predictive for body composition at age 2 years?

Boys vs girls? Breast vs formula?

METHOD

318 healthy term-born infants

Blood (3 months) & skinfolds (2 years)

Identification of 349 metabolites & lipids by LC-MC-method

Prediction for ‘high’ vs ‘low’ truncal / peripheral skinfold ratio (T:P-ratio) at age 2 years by Random forest machine learning

RESULTS

15 metabolites at age 3 months were modestly predictive for T:P-ratio at age 2 years

<table>
<thead>
<tr>
<th>Metabolite variables</th>
<th>Fold change</th>
<th>p-value</th>
<th>Fold change</th>
<th>p-value</th>
<th>Fold change</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LysoPS(22:2)</td>
<td>1.48</td>
<td>5.99x10^-6*</td>
<td>1.58</td>
<td>4.95x10^-5</td>
<td>1.37</td>
<td>0.021</td>
</tr>
<tr>
<td>Dimethylarginine</td>
<td>1.85</td>
<td>0.0001*</td>
<td>2.20</td>
<td>0.0001</td>
<td>1.50</td>
<td>0.074</td>
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<tr>
<td>LysoPE(20:1)</td>
<td>1.10</td>
<td>0.0008*</td>
<td>1.08</td>
<td>0.0053</td>
<td>1.09</td>
<td>0.059</td>
</tr>
<tr>
<td>LysoPG(16:0)</td>
<td>1.14</td>
<td>0.0022</td>
<td>1.11</td>
<td>0.0240</td>
<td>1.17</td>
<td>0.054</td>
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<tr>
<td>LysoPA(22:1)</td>
<td>1.41</td>
<td>0.0040</td>
<td>1.42</td>
<td>0.0122</td>
<td>1.39</td>
<td>0.101</td>
</tr>
</tbody>
</table>

Sensitivity = 100.0% Specificity = 50.0% Prediction = 75.8%

These 5/15 metabolites are associated with inflammatory processes

Associations were independent of infant feeding

Fold change > 1: infants with ‘high’ T:P-ratio at 2 years had higher metabolite level at age 3 months compared to infants with ‘low’ T:P-ratio

Conclusions:

Metabolic profile in the first months of life might contribute to adiposity programming, potentially due to low grade inflammation

CONCLUSIONS

Acknowledgements

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Presentation on Slide 3