Breastfeeding Predicts Blood Mitochondrial DNA Content in Adolescents
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BACKGROUND

Breastfeeding has positive effects on:

- **Immune system**
  - Decline in infantile infection rates 1,2
- **Cognitive function**
  - Higher cognitive development scores 3
- **Brain development**
  - Improved white matter development 4
  - Better psychomotor development 5

Mitochondria as potential mechanism

- Energy metabolism
- Role in various diseases incl. immune & brain diseases

RESULTS

### Association between breastfeeding and relative mtDNA content compared to non-breastfed adolescents

<table>
<thead>
<tr>
<th>Models:</th>
<th>% Difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>21.3% (2.9 to 42.9) *</td>
</tr>
<tr>
<td>Model 2</td>
<td>23.1% (4.4 to 45.2) *</td>
</tr>
</tbody>
</table>

Breasted (n=183); Non-breasted (i.e. reference group; n=120)

Sensitivity analysis

<table>
<thead>
<tr>
<th>Model 2</th>
<th>Excluding maternal smoking (a)</th>
<th>22.6% (2.3 to 47.0) *</th>
<th>26.9% (6.0 to 52.0) *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Excluding adolescence smoking (b)</td>
<td>26.2% (4.0 to 53.3) *</td>
<td>27.8% (3.0 to 58.6) *</td>
</tr>
<tr>
<td></td>
<td>Combination of (a) and (b)</td>
<td>26.2% (4.0 to 53.3) *</td>
<td>27.8% (3.0 to 58.6) *</td>
</tr>
<tr>
<td></td>
<td>Only females</td>
<td>14.7% (-10.8 to 47.6)</td>
<td>14.7% (-10.8 to 47.6)</td>
</tr>
<tr>
<td></td>
<td>Only males</td>
<td>27.8% (3.0 to 58.6) *</td>
<td>27.8% (3.0 to 58.6) *</td>
</tr>
<tr>
<td></td>
<td>Additionally adjusted for leukocyte amount</td>
<td>23.1% (4.4 to 45.2) *</td>
<td>23.1% (4.4 to 45.2) *</td>
</tr>
</tbody>
</table>

Association between duration of breastfeeding and relative mtDNA content compared to non-breastfed adolescents

<table>
<thead>
<tr>
<th>% Difference in mtDNA content (95% CI)</th>
<th>0</th>
<th>20</th>
<th>40</th>
<th>60</th>
<th>80</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 10 weeks</td>
<td>14.3%</td>
<td>16.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 - 20 weeks</td>
<td>20.2%</td>
<td>23.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;20 weeks</td>
<td>31.7%</td>
<td>31.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model 1: adjusted for BMI, sex, age, SES household, smoking, passive smoking, alcohol consumption of the adolescent, season, smoking of the mother during pregnancy, and age of mother at delivery.

Model 2: model 1 additionally adjusted for alcohol consumption of the mother during pregnancy, high blood pressure mother, and pre-term birth.

HIGHLIGHTS

Receiving breastfeeding in early life was associated with a 21.3% higher mtDNA content at adolescent age compared with adolescents who did not receive breastfeeding

The association between mtDNA content and breastfeeding is stronger when infants were longer breastfed

METHODS

Flemish Environment and Health Studies (2012 – 2016)

303 adolescents (14 – 15 years old)

Linear regression models adjusted for confounding variables

DISCUSSION

Breastfeeding is positively associated with mtDNA content

Possible mechanisms are:

- Protective effect of antioxidant compounds
- Alteration in metabolic hormones
- Altered energy metabolism
- Improved neurocognitive development

ACKNOWLEDGEMENTS

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