

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

¹ Kramer, 2012; ² Duijts, 2010; ³ Quigley, 2012; ⁴ Deoni, 2013; ⁵ Jardi, 2018

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

RESULTS

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

	% Difference (95% CI)
Models:	
Model 1	21.3% (2.9 to 42.9) *
Model 2	23.1% (4.4 to 45.2) *

Breastfed (n=183); Non-breastfed (i.e. reference group; n=120)

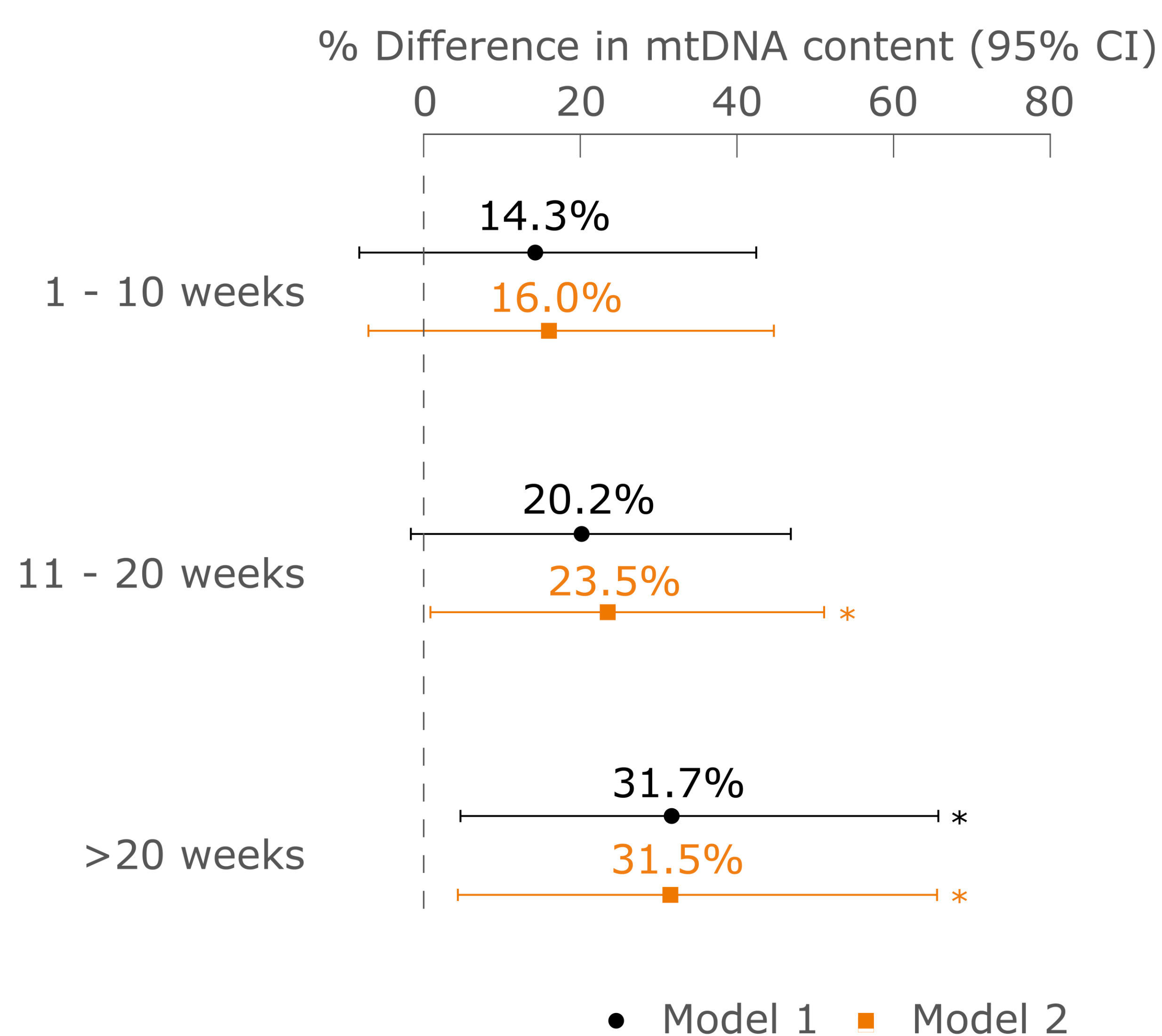
Sensitivity analysis

Model 2	n	% Difference (95% CI)
Excluding maternal smoking ^(a)	268	22.6% (2.3 to 47.0) *
Excluding adolescence smoking ^(b)	270	26.9% (6.0 to 52.0) *
Combination of ^(a) and ^(b)	244	26.2% (4.0 to 53.3) *
Only females	159	14.7% (-10.8 to 47.6)
Only males	144	27.8% (3.0 to 58.6) *
Additionally adjusted for leukocyte amount	303	23.1% (4.4 to 45.2) *

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.

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



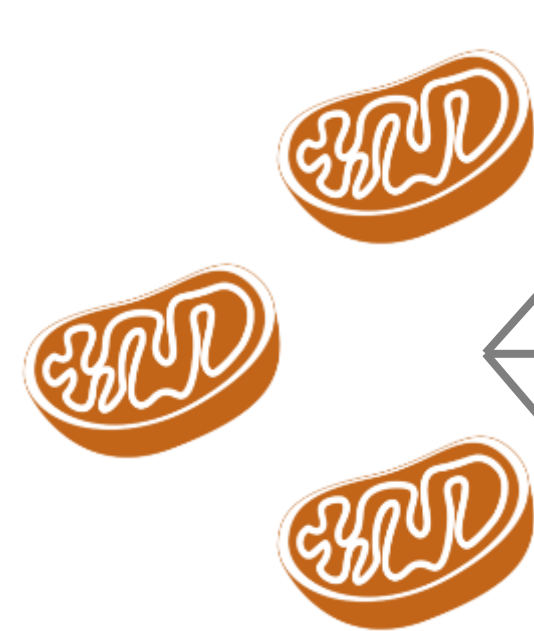
DISCUSSION

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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