FOOD-CT-2005-007036

EARNEST

EARly Nutrition programming- long term follow up of Efficacy and Safety Trials and integrated epidemiological, genetic, animal, consumer and economic research

Instrument: Integrated Project

Thematic Priority 5.4.3.1: Food Quality and Safety

Final public report on activity 1.2.1

Breastfeeding and coronary heart disease risk factors in childhood: follow-up of a randomised trial in Belarus

Start date of project: 15.04.2005 Duration: 5,5 Years

Organisation Name of Lead Contractor for this report: UNIVBRIS

PROJECT REPORT

Workpackage 1.2

Activity 1.2.1
Breastfeeding and coronary heart disease risk factors in childhood: follow-up of a randomised trial in Belarus: The Promotion of Breastfeeding Intervention Trial (PROBIT III)

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Goal: Observational studies which suggest that prolonged, exclusive breastfeeding reduces childhood obesity and cardiovascular disease risk may be confounded by factors influencing maternal choice to breastfeed. Similarly, observational studies suggest that a longer duration of breastfeeding helps mothers lose the excess fat they accumulated during pregnancy and may reduce cardiovascular disease risk.

Methods: Cluster-randomized controlled trial (PROBIT) involving 31 maternity hospitals and 17,046 children in Belarus, randomized to usual care (15 hospitals) or to a breastfeeding promotion intervention based on the WHO/UNICEF Baby Friendly Hospital Initiative (16 hospitals). The intervention substantially increased breastfeeding duration and exclusivity compared to the control arm (43% vs 6% exclusively breastfed at 3 months). At 11.5 years the children were followed up, including measures of adiposity, stature and blood pressure. We conducted an intention-to-treat analysis based on data from the first 12,374 (73%) children who were followed up, accounting for clustering by hospital. We also measured maternal height and weight, body fat with leg-leg bioimpedance, and blood pressure with an automated sphygmomanometer. We conducted an intention to treat analysis of data collected from the first 8709 mothers followed up, accounting for clustering by hospital.

Results for the children: Cluster-adjusted mean differences in experimental minus control groups were 0.16 kg/m^2 (95% CI: -0.08, 0.40) for BMI, 0.43% (-0.15, 1.01) for body fat, 0.33 cm (-1.25, 1.92) for waist circumference, 0.11 mm (-1.53, 1.74) for triceps and 0.09 mm (-0.71, 0.90) for subscapular skinfold thicknesses, 0.62 cm (-0.40, 1.64) for standing height, –0.04 cm (-0.64, 0.72) for trunk length, 0.62 cm (-0.02, 1.27) for leg-length, and 1.12 mmHg (-1.06, 3.30) for systolic and 0.87 mmHg (-0.56, 2.30) for diastolic blood pressure. The cluster-adjusted odds ratio for obesity (BMI $\geq 95^{th}$ percentile), comparing experimental versus control groups, was 1.19 (0.95, 1.50). Controlling for baseline co-variables yielded similar results.

Results for the mothers: Mean (SD) body mass index (BMI) was 26.8 (5.7) kg/m^2, body fat was 33.7 (8.3) %, and systolic blood pressure was 124.4 (14.5) mmHg; 24.5% of mothers were obese (BMI >= 30 kg/m^2). The two groups had similar outcome measures, with cluster-adjusted mean differences (95% confidence intervals) for intervention vs. control mothers of -0.41 kg/m^2 (-1.04, 0.23) for BMI, -0.52% (-1.29, 0.26) for body fat, and -0.40 mmHg (-3.42, 2.62) for systolic blood pressure. Adjustment for maternal characteristics did not substantially change estimates.

Future expected results: Blood assays: We will analyse data on insulin, adiponectin, insulin-like growth factor-1, apolipoprotein A1 and apolipoprotein B from dried blood spots collected

from the children (and glucose measured by glucometry). Over 13,000 blood spot samples have been collected and 432 samples will be assayed per week. So far 11,557 samples have been assayed in 28 weeks. Our assay results compare well with previous publications. We have completed a comparison study of blood spots versus serum with good results.

Interim results
N=11,557 (outliers +/- 4standard deviations were excluded)
Mean differences (95% confidence interval using robust standard errors) in experimental minus control groups for each assay are:

Adiponectin	-0.59	(-1.92 to 0.74)
Apo A1	-0.04	(-0.22 to 0.15)
Apo B	-0.02	(-0.30 to 0.27)
IGF1	-32.96	(-64.30 to -1.63)
Insulin	0.12	(-0.72 to 0.95)

Audit results: We will analyse audit measurements collected by independent auditors for a random sample of children and compare them to measurements collected by the paediatricians. Currently 29 polyclinics out of 31 have been audited. Results so far are good with high intraclass correlation coefficients for all measurements.

Conclusion: These results do not support a long-term beneficial effect of prolonged and exclusive breastfeeding on adiposity, stature or blood pressure in childhood. We also found no evidence that a successful breastfeeding promotion intervention resulted in lower maternal adiposity or blood pressure at 11.5 years postpartum, suggesting that previously reported associations are biased by residual confounding.

Practical applications: Previously reported beneficial effects on these outcomes may be the result of uncontrolled confounding and selection bias. It seems unwise to depend on current efforts to promote exclusive and prolonged breastfeeding as an effective population health strategy for stemming the current obesity epidemic or reducing the risk of future hypertension.