

EARLY-LIFE FEEDING PRACTICES AS A DETERMINANT OF LIPID METABOLISM IN CHILDREN: A PREVENTIVE PEDIATRIC PERSPECTIVE**Xo'janiyozova Maftuna Yusupboy qizi**

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<https://doi.org/10.5281/zenodo.20621292>**Abstract**

Background: Early nutrition is a key determinant of metabolic programming and long-term health. The type of feeding during infancy may influence lipid metabolism and future cardiometabolic risk.

Objective: To evaluate the relationship between infant feeding type and lipid metabolism indicators in children.

Methods: A longitudinal observational study included 124 children aged 0–14 years. Participants were divided into four groups according to feeding type: exclusive breastfeeding (n=40), partial breastfeeding (n=30), mixed feeding (n=20), and artificial feeding (n=34). Lipid profile parameters including triglycerides, LDL, HDL, and total cholesterol were analyzed.

Results: Artificially fed children demonstrated significantly higher triglyceride, LDL, and total cholesterol levels compared with exclusively breastfed children ($p<0.05$). HDL concentrations did not differ significantly between groups. Exclusive breastfeeding was associated with the most favorable metabolic profile.

Conclusion: Feeding type during infancy significantly affects lipid metabolism. Exclusive breastfeeding provides long-term protection against dyslipidemia and may reduce future cardiovascular risk.

Keywords: breastfeeding, lipid metabolism, cardiovascular risk, dyslipidemia, pediatric nutrition.

Introduction

The prevalence of childhood obesity and metabolic syndrome has increased worldwide during the last decades. Early-life nutrition has emerged as one of the most influential environmental factors affecting metabolic health. Breast milk contains numerous bioactive substances including immunoglobulins, hormones, growth factors, oligosaccharides, and microRNAs that contribute to optimal growth and metabolic regulation.

Several studies have demonstrated that breastfeeding reduces the risk of obesity, type 2 diabetes, hypertension, and cardiovascular diseases later in life. Conversely, formula feeding has been associated with accelerated growth and adverse metabolic outcomes.

Materials and Methods

The study enrolled 124 children aged 0–14 years. Participants were categorized according to infant feeding type.

Measured parameters included:

- Anthropometric indicators
- Blood glucose levels
- Total cholesterol
- LDL cholesterol
- HDL cholesterol
- Triglycerides

Statistical analyses were performed using Student's t-test. Differences were considered significant at $p < 0.05$.

Results

Artificial feeding was associated with the highest triglyceride concentrations (1.2 ± 0.08 mmol/L) compared with exclusive breastfeeding (0.74 ± 0.08 mmol/L).

Similarly, LDL cholesterol values increased progressively from breastfeeding to artificial feeding groups:

- EBF: 2.0 ± 0.01 mmol/L
- PBF: 2.2 ± 0.02 mmol/L
- MF: 2.8 ± 0.05 mmol/L
- AF: 3.4 ± 0.11 mmol/L

Total cholesterol reached the highest values in artificially fed children (5.7 ± 0.33 mmol/L).

Discussion

The protective effect of breastfeeding may be explained by several biological mechanisms.

First, breast milk promotes healthy gut microbiota colonization, which influences lipid metabolism and immune regulation.

Second, breast milk contains leptin and adiponectin, hormones involved in appetite regulation and energy balance.

Third, epigenetic modifications induced by breastfeeding may affect gene expression involved in lipid metabolism and insulin sensitivity.

The observed dyslipidemia among artificially fed children suggests early metabolic programming toward increased cardiometabolic risk.

Conclusion

Exclusive breastfeeding contributes to optimal lipid metabolism and may serve as an effective strategy for preventing future metabolic disorders. Public health programs should continue promoting breastfeeding as a cornerstone of preventive pediatric care.

