Breastfeeding, Long-Chain Polyunsaturated Fatty Acids in Colostrum, and Infant Mental Development

WHAT’S KNOWN ON THIS SUBJECT: Several studies have reported positive associations between breastfeeding and children’s cognition. Parental factors are thought to explain a large part of this association. However, the potential role of long-chain polyunsaturated fatty acid (LC-PUFA) content in breast milk remains uncertain.

WHAT THIS STUDY ADDS: This study is the first to assess the association between LC-PUFA levels in colostrum and children’s mental development in a large population-based study. LC-PUFA levels seem to play a beneficial role, particularly in children who are breastfed for longer durations.

**abstract**

**BACKGROUND:** Breastfeeding has been associated with improved neurodevelopment in children. However, it remains unknown to what extent nutritional advantages of breast milk may explain this relationship.

**OBJECTIVE:** We assessed the role of parental psychosocial factors and colostrum long-chain polyunsaturated fatty acid (LC-PUFA) levels in the relationship between breastfeeding and children’s neurodevelopment.

**METHODS:** A population-based birth cohort was established in the city of Sabadell (Catalonia, Spain) as part of the INMA-INfancia y Medio Ambiente Project. A total of 657 women were recruited during the first trimester of pregnancy. Information about parental characteristics and breastfeeding was obtained by using a questionnaire, and trained psychologists assessed mental and psychomotor development by using the Bayley Scales of Infant Development in 504 children at 14 months of age.

**RESULTS:** A high percentage of breastfeeds among all milk feeds accumulated during the first 14 months was positively related with child mental development (0.37 points per month of full breastfeeding [95% confidence interval: 0.06–0.67]). Maternal education, social class, and intelligence quotient only partly explained this association. Children with a longer duration of breastfeeding also exposed to higher ratios between n-3 and n-6 PUFAs in colostrum had significantly higher mental scores than children with low breastfeeding duration exposed to low levels.

**CONCLUSIONS:** Greater levels of accumulated breastfeeding during the first year of life were related to higher mental development at 14 months, largely independently from a wide range of parental psychosocial factors. LC-PUFA levels seem to play a beneficial role in children’s mental development when breastfeeding levels are high. *Pediatrics* 2011;128:e880–e889

**AUTHORS:** Mònica Guxens, MD, MPH, PhD,a,b,c Michelle A. Mendez, PhD,a,b,c Carolina Moltó-Puigmartí, DPharm, PhD,d,c Jordi Julve, PhD,a,b,c Raquel García-Esteban, MSC,a,b,c Joan Forns, BSc, MPH,a,b,c Muriel Ferrer, BSc,a,b,c Martine Vrijheid, PhD,a,b,c M. Carmen López-Sabater, DPharm, PhD,d,c and Jordi Sunyer, MD, PhD,a,b,c,e

aCenter for Research in Environmental Epidemiology, Barcelona, Spain; bHospital del Mar Research Institute, Barcelona, Spain; cCIBER Epidemiología y Salud Pública, Barcelona, Spain; dDepartment of Nutrition and Food Science, Faculty of Pharmacy, University of Barcelona, Barcelona, Spain; ePompeu Fabra University, Barcelona, Spain

**KEY WORDS**

child development, cognition, breastfeeding, fatty acids, unsaturated, intelligence

**ABBREVIATIONS**

LC-PUFA—long-chain polyunsaturated fatty acid

IQ—intelligence quotient

ALA—α-linolenic acid

EPA—ecosapentaenoic acid

DPA—docosapentaenoic acid

DHA—docosahexaenoic acid

LA—linoleic acid

GLA—γ-linolenic acid

DGLA—dihomo-γ-linolenic acid

AA—arachidonic acid

ADA—adrenic acid

OA—osbond acid

CI—confidence interval

www.pediatrics.org/cgi/doi/10.1542/peds.2010-1633
doi:10.1542/peds.2010-1633

Accepted for publication Jun 29, 2011

Address correspondence to Mònica Guxens, MD, MPH, PhD, Centre for Research in Environmental Epidemiology, Carrer Dr Aiguader 88, 08005, Barcelona, Spain. E-mail: mguxens@creal.cat

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2011 by the American Academy of Pediatrics

**FINANCIAL DISCLOSURE:** The authors have indicated they have no financial relationships relevant to this article to disclose.

**COMPANION PAPER:** A companion to this article can be found on page e890, and online at www.pediatrics.org/cgi/doi/10.1542/peds.2010-3153.