Prospective Cohort Study of Breastfeeding and the Risk of Childhood Asthma

Anne Kristine Lossius, MD, Maria Christine Magnus, PhD, Jon Lunde, MD, and Ketil Stærdal, MD, PhD

Objectives To study whether the duration of breastfeeding and time for introduction of complementary foods was associated with the risk of childhood asthma.

Study design We used data from the Norwegian Mother and Child Study, a nationwide prospective cohort study that recruited pregnant women from across Norway between 1999 and 2008. Children with complete data of breastfeeding up to 18 months and current age ≥7 years were eligible (n = 41,020). Asthma as the primary outcome was defined based on ≥2 dispensed asthma medications at age 7 years registered in the Norwegian Prescription Database. We used log-binomial regression models to obtain crude relative risks (RRs) in the main analysis, and adjusted for selected confounders in multivariable analyses.

Results For duration of any breastfeeding, 5.9% of infants breastfed <6 months (adjusted RR [aRR] 1.05, 0.93-1.19) and 4.6% breastfed 6-11 months (aRR 0.96, 0.87-1.07) had dispensed asthma medications at age 7 years compared with 4.6% of infants breastfed ≥12 months (P_trend .62). Infants still breastfed at 6 months, but introduced to complementary foods <4 months and 4-6 months, had an aRR of 1.15 (0.98-1.36) and 1.09 (0.94-1.27) respectively, compared with infants fully breastfed for 6 months (P_trend .09). Ages at introduction of solids or formula separately were not significant predictors (P_trend .16 and .08, respectively).

Conclusions We found no association between duration of breastfeeding or age of introduction to complementary foods and asthma at age 7 years. (J Pediatr 2017;.)
The Norwegian Mother and Child Cohort Study (MoBa) is a prospective population-based pregnancy cohort study conducted by the Norwegian Institute of Public Health. Pregnant women were recruited from all over Norway from 1999 to 2008 at approximately 18 gestational weeks. The participation rate was 41%, and all participants provided a written informed consent. Follow-up was conducted by mailed questionnaires at regular intervals.

The study is based on version VIII of the quality-assured data files released for research on February 14, 2014. In the current study, we use information from 6 questionnaires; the baseline questionnaire completed at approximately week 18 of pregnancy, questionnaires at child age 6, 18, and 36 months and 7 years, and the father’s questionnaire (completed at recruitment; questionnaires are available at www.fhi.no/moba). Information gathered through questionnaires was linked to the Medical Birth Registry of Norway and the Norwegian Prescription Database (NorPD) using unique national identification numbers. The current study was approved by the Norwegian Data Inspectorate and the Regional Committee for Medical and Health Research Ethics of South-East Norway.

We included individuals with information from the questionnaire completed at 18 gestational weeks, in addition to questionnaire completed when the child was 6 and 18 months of age, who had reached age 7 years by December 31, 2013 (n = 41,020, Figure 1). We decided to use information about asthma medication from the NorPD as the primary outcome to reduce the impact of self-selection at age 7 years. Out of the parents who received the age 7-year questionnaire, 54% answered and returned it to MoBa. Characteristics of participants with missing exposure information up to age 18 months and, thus, not included are presented in Table I.

The primary outcome was current asthma at age 7 years as defined based on dispensed prescriptions in the NorPD, which contains information regarding all dispensed medications in Norway from January 2004 and onward, and classifies medications according to the Anatomical Therapeutic Chemical classification system. Medications classified as asthma medications were inhaled short- and long-acting beta2-agonists (R03 AC), inhaled corticosteroids (R03 BA), fixed-dose combinations of inhaled beta2-agonists and corticosteroids (R03 AK), and leukotriene antagonists (R03 DC). Children who had at least 1 dispensed prescription for asthma medications in the past year at the age of 7 years, in addition to a second dispensed prescription within 12 months of the first, were defined as asthma cases.

As secondary outcomes, we defined current asthma at age 3 and 7 years based on maternal report through questionnaires. Current asthma was defined based on maternal “yes, has now” in response to the question if the child suffered from asthma and reported use of inhaled glucocorticoids and/or beta2-agonists the last 12 months. Positive answers to both asthma diagnosis and use of medications were required for our definition of current asthma.

We classified children with asthma into 3 groups; early transient (asthma at only age 3 years), late-onset (asthma onset after age 3 years), and persistent asthma (asthma at both age 3 and

Figure 1. Flow chart of participants in the study. MBRN, Medical Birth Registry of Norway; NorPD, Norwegian Prescription Database. *Missing 6-month and/or 18-month questionnaire (n = 29,329).
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