EUROPEAN RESPIRATORY JOURNAL
ORIGINAL RESEARCH ARTICLE
S.M. MENSINK-BOUT ET AL.

SHAREABLE PDF

Maternal diet in pregnancy and child's respiratory outcomes: an individual participant data meta-analysis of 18 000 children

Sara M. Mensink-Bout[1,2], Evelien R. van Meel[1,2], Johan C. de Jongste[2], Isabella Annesi-Maesano[3], Adrien M. Aubert[4], Jonathan Y. Bernard[4,5], Ling-Wei Chen[6], Cyrus Cooper[7,8], Sarah R. Crozier[7], Wojciech Hanke[9], Nicholas C. Harvey[7,8], James R. Hébert[10,11], Barbara Heude[4], Joanna Jerzynska[12], Cecily C. Kelleher[6], John Mehegan[6], Fionnuala M. McAuliffe[13], Catherine M. Phillips[6], Kinga Polanska[9], Caroline L. Relton[14], Nitin Shivappa[10,11], Matthew Suderman[14], Vincent W.V. Jaddoe[1,15] and Liesbeth Duijts[1,2,16]

[1]The Generation R Study Group, Erasmus MC, University Medical Center, Rotterdam, The Netherlands. [2]Department of Pediatrics, Division of Respiratory Medicine and Allergology, Erasmus MC, University Medical Center, Rotterdam, The Netherlands. [3]Institute of Epidemiology and Public Health, EPAR, Sorbonne Université, Paris, France. [4]Centre for Research in Epidemiology and StatisticS (CRESS), Université de Paris, Paris, France. [5]Singapore Institute for Clinical Sciences (SICS), Agency for Science, Technology and Research (A*STAR), Singapore. [6]HRB Centre for Health and Diet Research, School of Public Health, Physiotherapy, and Sports Science, University College Dublin, Dublin, Ireland. [7]MRC Lifecourse Epidemiology Unit, University of Southampton, Southampton General Hospital, Southampton, UK. [8]NIHR Southampton Nutrition Biomedical Research Centre, University of Southampton and University Hospital Southampton NHS Foundation Trust, Southampton, UK. [9]Department of Environmental Epidemiology, Nofer Institute of Occupational Medicine, Lodz, Poland. [10]Cancer Prevention and Control Program and Department of Epidemiology and Biostatistics, Arnold School of Public Health, University of South Carolina, Columbia, SC, USA. [11]Department of Nutrition Connecting Health Innovations LLC, Columbia, SC, USA. [12]Department of Pediatrics and Allergy, Medical University of Lodz, Copernicus Memorial Hospital, Lodz, Poland. [13]UCD Perinatal Research Centre, School of Medicine, University College Dublin, National Maternity Hospital, Dublin, Ireland. [14]MRC Integrative Epidemiology Unit, Population Health Sciences, Bristol Medical School, University of Bristol, Bristol, UK. [15]Department of Pediatrics, Erasmus MC, University Medical Center, Rotterdam, The Netherlands. [16]Department of Pediatrics, Division of Neonatology, Erasmus MC, University Medical Center, Rotterdam, The Netherlands.

Corresponding author: Liesbeth Duijts (l.duijts@erasmusmc.nl)

Check for updates

Shareable abstract (@ERSpublications)
A suboptimal maternal diet in pregnancy, as defined by a higher inflammatory potential or low quality of the diet, does not play an important role in the development of respiratory diseases in childhood https://bit.ly/38dj3jU

Cite this article as: Mensink-Bout SM, van Meel ER, de Jongste JC, *et al*. Maternal diet in pregnancy and child's respiratory outcomes: an individual participant data meta-analysis of 18 000 children. *Eur Respir J* 2022; 59: 2101315 [DOI: 10.1183/13993003.01315-2021].

Received: 28 Aug 2020
Accepted: 20 Aug 2021

Abstract

Rationale Severe fetal malnutrition has been related to an increased risk of respiratory diseases later in life, but evidence for the association of a suboptimal diet during pregnancy with respiratory outcomes in childhood is conflicting. We aimed to examine whether a pro-inflammatory or low-quality maternal diet during pregnancy was associated with child's respiratory health.

Methods We performed an individual participant meta-analysis among 18 326 mother–child pairs from seven European birth cohorts. Maternal pro-inflammatory and low-quality diets were estimated by energy-adjusted Dietary Inflammatory Index (E-DII) and Dietary Approaches to Stop Hypertension (DASH) scores. Preschool wheezing and school-age asthma were measured using questionnaires and lung function by spirometry.

Results After adjustment for lifestyle and sociodemographic factors, we observed that a higher maternal E-DII score (a more pro-inflammatory diet) during pregnancy was associated only with a lower forced vital capacity (FVC) in children (z-score difference −0.05, 95% CI −0.08– −0.02, per interquartile range increase). No linear associations of the maternal E-DII or DASH score with child's wheezing or asthma were observed. In an exploratory examination of the extremes, a very low DASH score (<10th percentile)

(a very low dietary quality) was associated with an increased risk of preschool wheezing and a low forced expiratory volume in 1 s/FVC (z-score <−1.64) (OR 1.20, 95% CI 1.06–1.36 and z-score difference 1.40, 95% CI 1.06–1.85, compared to ⩾10th percentile), with corresponding population attributable risk fractions of 1.7% and 3.3%, respectively.

Conclusion The main results from this individual participant data meta-analysis do not support the hypothesis that maternal pro-inflammatory or low-quality diet in pregnancy are related to respiratory diseases in childhood.