Association between prenatal exposures to ambient air pollution and birthweight

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Citation

Weihsueh Chiu, Natalie Johnson, Juleen Lam, Xiaohui Xu, Brandi Taylor, Margaret Foster, Megan Moriarty, Inyang Uwak, Samuel Taiwo. Association between prenatal exposures to ambient air pollution and birthweight. PROSPERO 2017 CRD42017058805 Available from: http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42017058805

Review question

Does developmental exposure to ambient particulate air pollution affect Birth Weight?

Searches

We will perform electronic searches of online databases (Ovid MEDLINE, Embase, and Global Health) using the search terms outlined in Appendix II of the Protocol.

Types of study to be included

No restrictions.

Condition or domain being studied

Full term birth weight, measured as a continuous variable.

Participants/population

Neonates.

Intervention(s), exposure(s)

Exposure to ambient particulate air pollution that occurred prior to birth. "Particulate air pollution" is defined as an outdoor source of an inhaled airborne environmental chemical classified as PM 2.5 or PM10, excluding active and passive smoking. Additionally, air pollution due to biomass burning (e.g., forest fires) is not included.

Comparator(s)/control

Humans exposed to lower levels of air pollution than the more highly exposed humans.

Context

Primary outcome(s)

Birth weight measured as a continuous variable.

Secondary outcome(s)

None.

Data extraction (selection and coding)

For each included article, data relevant to the outcomes assessed will be extracted into the Health Assessment Workspace Collaborative (HAWC) database (see Appendix III of the protocol for the data collection form). The data extracted by each author will be independently reviewed by a second author for quality assurance/quality control. Under the direction of a third author, authors will resolve any discrepancies.

Risk of bias (quality) assessment

Risk of bias (ROB) will be assessed for human studies using domains from the Cochrane Collaboration's "Risk of Bias" tool and the Agency for Healthcare Research and Quality's (AHRQ) criteria (Higgins and

Deeks 2011, Viswanathan et al. 2012). These tools have been modified to make them appropriate for human observational studies, and include domains that address recruitment strategy, blinding, confounding, exposure assessment, incomplete outcome data, selective outcome reporting, and conflict of interest (Appendix VI). These tools have been modified and applied to evaluate risk of bias in previous case studies applying the Navigation Guide systematic review methodology (Johnson et al. 2014, Johnson et al. 2014). Informed by empirical data from meta-analyses conducted on pharmacological treatments and studies of risk of bias and sponsorship (Roseman et al. 2011, Lundh et al. 2012, Krauth et al. 2013), we additionally assess funding source and declared conflicts of interest as potential sources of bias. We will also search for each study in PubMed and note if there has been a retraction of the published article in order to determine if the study may be fraudulent or if any corrections have been published.

Two review authors from our review team will independently make risk of bias determinations for each study. Each review author will be assigned a set of studies and will rate these across all ROB domains. An additional QA/QC author will be matched with each study. Any discrepancies will be reviewed by the QA/QC author and discussed among all three reviewers. Any remaining discrepancies will then be reviewed by all other review authors. If, upon further discussion the review authors cannot reach agreement on an appropriate risk of bias determination for a particular domain, the rating judgment will be selected as follows: if one reviewer makes a judgment of 'high' risk of bias and the other makes a judgment of 'probably high' risk of bias, the 'probably high' risk of bias judgment will be used, etc. If additional data or information is acquired from study authors, risk of bias judgments will be modified to reflect the updated study information.

Strategy for data synthesis

If appropriate, a meta-analysis will be performed to summarize the effects of exposure to ambient particulate air pollution on birth weight outcome and to assess the impact of study design characteristics on findings. Characteristics from each study will be compiled and reviewed to establish comparability between studies or to identify data transformations necessary to ensure such comparability.

Analysis of subgroups or subsets

• Study design
• Details on how participants were classified into exposure groups, if any (e.g. quartiles of exposure concentrations)
• Details on source of exposure data (questionnaire, air monitoring, biomonitoring, etc.)
• Exposure levels, method of measurement, timing of measurement
• Type of data/summary statistic available

Contact details for further information

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Organisational affiliation of the review

None

Review team members and their organisational affiliations

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Anticipated or actual start date
05 January 2016

Anticipated completion date
31 May 2018

Funding sources/sponsors
There is no current external funding for this review.

Conflicts of interest
None known

Language
English

Country
United States of America

Published protocol
https://www.crd.york.ac.uk/PROSPEROFILES/58805_PROTOCOL_20170225.pdf

Stage of review
Review_Ongoing

Subject index terms status
Subject indexing assigned by CRD

Subject index terms
Air Pollution; Birth Weight; Female; Humans; Pregnancy; Prenatal Exposure Delayed Effects

Date of registration in PROSPERO
25 March 2017

Date of publication of this version
25 March 2017

Details of any existing review of the same topic by the same authors

Stage of review at time of this submission

Stage	Started	Completed
Preliminary searches	Yes	Yes
Piloting of the study selection process	Yes	Yes
Formal screening of search results against eligibility criteria	Yes	Yes
Data extraction	No	No
Risk of bias (quality) assessment	No	No
Data analysis	No	No

Versions
25 March 2017