

Switzerland - Baseline values, between and within subject variability of non-invasive biomarkers of inflammation and oxidative stress

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Overview

Identification

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Version

VERSION DESCRIPTION

Version 1.0

Overview

ABSTRACT

In the field of engineered nanomaterials (ENMs) exposure biomonitoring, oxidative stress biomarkers measured in urine and exhaled breath condensate (EBC) appear promising to detect early effects. However, baseline values for the oxidative stress biomarkers are still not known. For human biomonitoring, different matrices can be used. Blood seems to be the ideal matrix for most chemicals but has an important disadvantage of being invasive. Our matrices permit a non-invasive biomonitoring.

We focus on four oxidative stress biomarkers: 8-OHdG, 8-isoprostane, malondialdehyde and H₂O₂. These biomarkers seem to be the most relevant for biomonitoring and for detecting early effects in workers handling ENMs.

A systematic literature review was performed to determine the baseline values of these biomarkers in urine and EBC in a healthy non-smoking adult (≥ 18 years) population. Searches were conducted for literature published since journal inception and up to April 2019 in the following bibliographic electronic databases: The Cochrane Central Register of controlled Trials, EMBASE, PubMed, and Web of Science. Two reviewers screened the titles and abstracts with disagreements resolved by consensus. The full-text review and the data extraction are ongoing.

A meta-analysis will be performed for each biomarker. As most of the selected studies include few participants and use non-standardized analytical methods, the results need to be harmonized to be able to establish baseline values and inter / intra individual variations.

We plan to carry out subgroup analysis by gender, by age and by country of origin. In addition, subgroup analyses will be done for people with respiratory diseases (COPD, asthma, lung cancer), for smokers and for workers exposed to ENMs. To our knowledge, this systematic review is the first providing baseline values for these four oxidative stress biomarkers. It is essential for enabling meaningful interpretation of the results from biomonitoring programs conducted in occupational and environmental settings.

KIND OF DATA

Text data / Systematic review requests

KEYWORDS

Oxidative stress, inflammation, biomarkers, 8-hydroxy-2-deoxyguanosine, 8-isoprostane, malondialdehyde, urine, exhaled breath condensate

Coverage

UNIVERSE

Healthy non-smoking adults (≥ 18 years) of both sexes.

Producers and Sponsors

PRIMARY INVESTIGATOR(S)

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FUNDING

Name	Abbreviation	Role
European Union, Project NanoExplore (Grant N° LIFE17 ENV/GR/000285)		Funder
Center for Primary Care and Public Health (Unisanté), University of Lausanne, Switzerland	Unisanté	Funder

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DDI DOCUMENT VERSION

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Sampling

No content available

Questionnaires

No content available

Data Collection

Data Collection Dates

Start	End	Cycle
2019-04-01	2020-07-01	N/A

Data Collection Mode

Bibliographic electronic databases: The Cochrane Central Register of controlled Trials (CENTRAL, Cochrane Library), EMBASE, PubMed, and Web of Science.

Data Processing

Data Editing

Two reviewers will independently performed in Rayyan QCRI a first screening of titles and abstracts retrieved during the searches. Abstracts that have provided insufficient information with regard to the inclusion and exclusion criteria will be retained and downloaded in the EndNote software for full-text analysis and re-assessed by two researchers independently. In case of disagreement on the inclusion/exclusion of one or more papers, the two reviewers will discuss their points of view; if no consensus is reached a third reviewer is consulted. This process allows to finalize the list of studies to be included in the review. Throughout this process, A PRISMA (Preferred Reporting Items for systematic Reviews and Meta-Analyses) flow diagram will be completed.

A data extraction form will be designed in advance according to the research objectives and contents of the articles. It will be tested by two independent researchers and validated by a statistician with strong experience in meta-analysis.

Two researchers will independently extract and check the published data.

The information extracted will be as follows: first author name, publication time, study type, analytic method, the sample time, the number of participants, the gender, the mean age, the mean BMI, their smoking status, season, occupation, pregnancy, diet, vitamin, exercise, outcomes, references, DOI.

Data Appraisal

No content available