

Protective effects of nutritional polyphenols on DNA damage, assessed with the Comet assay

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Citation

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Review question

What is the evidence of protective antigenotoxic effects of polyphenols, which is demonstrated using the Comet assay?

Searches

Literature search will be performed on PubMed.

No restrictions on publication date will be imposed.

Only papers published in English will be considered for analysis.

Initial search was performed 15/09/2019. Search will be re-run prior to final analysis.

Types of study to be included

There are no restrictions on the types of study design.

Condition or domain being studied

Within the context of oxidative cell damage, which is relevant for cardiometabolic and neurodegenerative diseases or cancer, this review will be focused on DNA damage assessed with the Comet assay, and DNA-protective and antioxidant properties of nutritional polyphenols.

Participants/population

Inclusion: Studies on healthy individuals or patients with cardiometabolic and neurodegenerative diseases or cancer, both men and women, exposed or unexposed to various genotoxicants, will be included in this review.

Exclusion: Adolescents (under 18 years of age) and elderly people (over 70).

Intervention(s), exposure(s)

Polyphenols relevant for human nutrition - pure compounds or extracts or foods rich with polyphenols.

Interventions with medicinal plants will be excluded.

Comparator(s)/control

Placebo. Non-exposed control group.

Context

Human intervention studies with nutritional polyphenols.

Main outcome(s)

Significant decrease in DNA damage, assessed with the Comet assay.

Measures of effect

Analysis of the characteristics of comets, before and after the treatment with polyphenols.

Additional outcome(s)

Effects on DNA damage assessed with other assays for genotoxicity.

Effects on the cellular redox balance assessed with various biomarkers of oxidative stress.

Effects on biomarkers of cardiometabolic and neurodegenerative diseases or cancer.

Measures of effect

Analysis of relevant biomarkers, before and after the treatment with polyphenols.

Data extraction (selection and coding)

Study selection: Two reviewers will independently screen records. In case of disagreement, third reviewer will be asked for opinion.

Data extraction: One reviewer will extract data and another will check the extracted data. In case of disagreement, third reviewer will be asked for opinion.

Extracted data will be included in an Excel table, specifically designed for this systematic review.

Extracted data will include:

- Information about the paper (PMID, authors, title, year of publication)
- Whether this is a study on cardiometabolic disease or neurodegenerative disease or cancer
- Positive outcomes, other than oxidative stress parameters
- Study design
- Number of participants
- Age of the participants
- Sex of the participants
- Health status of the participants

- Type of Comet assay
- Type of cells analyzed with the Comet assay
- Polyphenol used for treatment
- Dose
- Placebo
- Duration of the treatment
- Outcome of the Comet assay
- Other assays for genotoxicity (if YES, please specify)
- Outcome/s of the other assays for genotoxicity (if applicable)
- Oxidative stress parameters, other than Comet assay
- Outcome/s of the oxidative stress parameters (if applicable)

Risk of bias (quality) assessment

To assess the quality of studies, the following characteristics will be primarily taken into account: composition of placebo, randomisation, blinding and outcomes.

Two reviewers will independently screen these characteristics. In case of disagreement, third reviewer will be asked for opinion.

Strategy for data synthesis

The data will be synthesised according to the outcomes of the Comet assay, as the main outcome of the review.

According to the number of eligible papers, other outcomes will be also taken into account.

This will be a narrative review.

Analysis of subgroups or subsets

Analysis of subgroups will depend on the number of eligible papers.

Contact details for further information

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Organisational affiliation of the review

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Review team members and their organisational affiliations

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Type and method of review

Narrative synthesis, Systematic review

Anticipated or actual start date

15 September 2019

Anticipated completion date [1 change]

10 February 2023

Funding sources/sponsors

NATO Project: SPS MYP G5266, "A Field Detector for Genotoxicity from CBRN and Explosive Devices".

Conflicts of interest

None known

Language

English

Country

Macedonia (FYROM)

Stage of review [1 change]

Review Completed not published

Subject index terms status

Subject indexing assigned by CRD

Subject index terms

Humans

Date of registration in PROSPERO

28 April 2020

Date of first submission

22 January 2020

Stage of review at time of this submission [1 change]

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	Yes	Yes
Risk of bias (quality) assessment	Yes	Yes
Data analysis	Yes	Yes

Revision note

The record was updated for the dates of completion and anticipated publication.

The record owner confirms that the information they have supplied for this submission is accurate and complete and they understand that deliberate provision of inaccurate information or omission of data may be construed as scientific misconduct.

The record owner confirms that they will update the status of the review when it is completed and will add publication details in due course.

Versions

28 April 2020

10 February 2023