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Comprehensive Systematic Review and Meta-Analysis of the association between Selenium and Epithelial Ovarian Cancer (EOC) among women

Review methods were amended after registration. Please see the revision notes and previous versions for detail.

Citation

K.C.M Perera, Susan Jordan, W.N.D. Perera, H.T.C.S. Abeysena. Comprehensive Systematic Review and Meta-Analysis of the association between Selenium and Epithelial Ovarian Cancer (EOC) among women. PROSPERO 2022 CRD42022356472 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42022356472

Review question

What is the relationship between selenium (intake or supplements, measures of selenium in blood, toenails, or other biological samples, and measures of serum selenoproteins) and Epithelial Ovarian Cancer risk among women who have not had an oophorectomy?

Searches

A comprehensive electronic search in PubMed and MEDLINE, EMBASE, Scopus, Proquest, and Web of Science from the starting date of the databases will be undertaken without limitations related to the language and publication status.

In addition, references of review articles, systematic reviews, meta-analyses, commentaries, editorials, meeting abstracts, and references of the included studies will be screened for relevant articles. Further, books related to gynecological malignancies and hand searches of journals will be done. And also search for grey literature such as conference abstracts/proceedings, published list of thesis and dissertations, and other literature outside of the main journal literature, where possible will be done.

Further, needs to identify and include unpublished outcomes and studies by searching informal sources, including meeting abstracts and Ph.D. theses, and contacting authors of included studies.

Types of study to be included [1 change]

Inclusion criteria:

1. Cohort studies that compared women with the lowest selenium intake or supplements, the lowest level of serum, toenail, or other biological samples selenium, and the lowest level of serum selenoprotein with the highest selenium intake or supplements, the highest level of serum, toenail, or other biological samples selenium, and the highest level of serum selenoprotein, and provided adjusted risk estimates (i.e. hazard ratios, or risk ratios with 95% confidence intervals [CIs]) or provided data allowing the calculation of the risk estimates and 95% CIs for the association between selenium and EOC.

2. Case-control studies that defined the control group as women without ovarian cancer and compared the selenium

intake or supplements, level of serum, toenail, or other biological samples selenium, and level of serum selenoprotein of women with ovarian cancers, and provided adjusted risk estimates (i.e. odds ratio [OR] with 95%CIs) or provided data allowing the calculation of the OR and 95%CIs of the association between selenium and EOC.

3. Randomized Control studies (RCTs).

4. Ecological studies will be considered for inclusion in the systematic review.

5. Cross-sectional analytical studies.

6. Studies published across all dates, times, and countries.

7. Studies published in other languages (translated to English by the Google translator).

Exclusion criteria:

1. Descriptive studies (i.e. case reports, case series, editorials, and opinion pieces).

Condition or domain being studied

The association between selenium and Epithelial Ovarian Cancer risk

Participants/population

Women from the general population, who are at risk of developing ovarian cancer.

Intervention(s), exposure(s)

The exposure of interest is high selenium intake from either food sources or supplements. We will also consider high measures of selenium in blood, toenails, or other biological samples and high measures of serum selenoproteins.

Comparator(s)/control

Women with a low selenium intake from either food sources or supplements. We will also consider low measures of selenium in blood, toenails, or other biological samples and low measures of serum selenoproteins.

Context

Studies undertaken in all populations will be considered for the systematic review.

Main outcome(s)

In this review, the primary outcome will be Epithelial Ovarian Cancer(EOC). Where possible associations will also be explored by EOC histotype.

Measures of effect

Relative risk measures (relative risks, rate ratios, risk ratios, hazard ratios, odds ratios, and their 95%CIs) of the association between selenium and ovarian cancer will be extracted from publications.

Additional outcome(s)

Not applicable.

Data extraction (selection and coding)

Two review authors will independently screen studies using COVIDENCE software for systematic reviews under the University of Queensland multiple systematic review license according to the following procedure;

• Retrieve studies to the COVIDENCE software and remove duplicates

• Assess the title and abstract of all studies and remove irrelevant

• Assess the full text of all studies identified as possibly relevant

• Select studies for systematic review

Any disagreement between two review authors over the eligibility of particular studies will be resolved through discussion with a third reviewer.

Two review authors will independently retrieve the following general study information, where available, from all included studies: author, publication year, study design, study setting; study population, participant demographics and baseline characteristics, details of the intervention and control conditions, study methodology, recruitment and study completion rates, outcomes with risk estimates and 95%CIs, adjusted/matched factors for individual studies and times of outcome measurement, and information for the assessment of the risk of bias. Discrepancies will be identified and resolved through discussion (with a third author where necessary). Missing data will be requested from the study authors.

Risk of bias (quality) assessment

Two review authors will independently use the ROBINS-1 quality assessment scale for observational studies in the absence of RCTs to assess the risk of bias (i.e. selection bias, measurement bias, and confounding bias for each study). Formulate risk of bias judgments for each of the seven bias domains, informed by answers to the signaling question. Disagreements between the two review authors over the risk of bias in particular studies will be resolved by discussion, with the involvement of a third review author where necessary.

Strategy for data synthesis

One review author will abstract data into standard evidence tables, and the second review author will check them for accuracy. The findings will be synthesized via a narrative description in the first place. If possible, a quantitative synthesis will be undertaken using random effect meta-analysis for pooling data assuming that all of the studies are estimating the same underlying effect and variation between their results is due to chance. The results will be displayed in a forest plot. All analyses will be conducted using STATA.

Analysis of subgroups or subsets

Heterogeneity between the studies in effect measures will be assessed using the I^2 statistic. An I^2 value greater than 50% is indicative of substantial heterogeneity and sensitivity analyses will be undertaken to assess the cause of heterogenicity. A subgroup analysis will be performed to examine any sources of significant heterogeneity according to the different types of studies (cohort, case-control, and cross-sectional analytical), study quality, and exposure (highest selenium dietary intake/supplements) and controls (lowest selenium dietary intake/supplements).

Contact details for further information

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Organisational affiliation of the review

The School of Public Health, University of Queensland

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Review team members and their organisational affiliations [1 change]

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Type and method of review [1 change]

Epidemiologic, Meta-analysis, Systematic review

Anticipated or actual start date

30 August 2022

Anticipated completion date [2 changes]

31 January 2023

Funding sources/sponsors

Not applicable

Conflicts of interest

Language [1 change]

English

Country

Australia, Sri Lanka

Stage of review

Review Ongoing

Subject index terms status

Subject indexing assigned by CRD

Subject index terms

Carcinoma, Ovarian Epithelial; Female; Humans; Neoplasms, Glandular and Epithelial; Ovarian Neoplasms; Selenium

Date of registration in PROSPERO

08 September 2022

Date of first submission

28 August 2022

Stage of review at time of this submission

The review has not started

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

Revision note

The anticipated completion date extended from 30.11.2022 to 31.01.2023

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

08 September 2022

08 September 2022

13 September 2022

06 November 2022