Statins and cancer: a meta-analysis of case-control studies

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CRD summary
The review concluded that there was a significant association between statin usage and cancer protection, but when the results were stratified by cancer location only one cancer type (colon) was significant. There were some data limitations and methodological problems with the review, but the authors’ cautious interpretation of their data and recommendation for further research and practice seem appropriate.

Authors' objectives
To determine if there is an association between statins and cancer in previously published case control studies.

Searching
MEDLINE, CINAHL, Excerpta Medica, Web of Science, Scopus and BIOSIS Previews were searched to November/December 2006 for articles published in English. Search terms were reported. Reference lists of retrieved studies were searched.

Study selection
Case control studies that examined the relationship between any statin and any cancer were eligible for inclusion. Studies had to provide data sufficient for calculating an odds ratio (OR) and 95% confidence interval (CI) for risk of cancer.

The included studies examined the association between statin use in patients with cancer of the prostate, lung, pancreas, oesophagus, kidney, breast, colon, lymphoma (B cell, T cell and non-Hodgkin) and non-specified cancer type.

Three reviewers independently performed study selection.

Assessment of study quality
The authors stated that they were unable to assess validity.

Data extraction
Data were extracted on the incidence of cancer and used to calculate odds ratios and 95% CIs.

Methods of synthesis
Random-effects meta-analysis (DerSimonian Laird model) was utilised to generate pooled odds ratios and 95% CIs. Statistical heterogeneity was calculated using X^2. Subgroup analysis was undertaken according to site of cancer. Sensitivity analysis was conducted for papers versus abstracts. Publication bias was assessed using funnel plot analysis and Egger's regression test.

Results of the review
Nineteen case-control studies (n=100,129 cancer cases) were included in the review.

The odds of cancer were statistically significantly lower with statins compared with control (OR 0.71, 95% CI 0.56 to 0.89; 19 studies). Sensitivity analysis revealed that the results were statistically significant for abstracts (OR 0.63, 95% CI 0.49 to 0.81), but not for papers (OR 0.80, 95% CI 0.61 to 1.04).

Subgroup analysis showed that statins offered a statistically significantly protective effect compared with control for colon cancer (OR 0.89, 95% CI 0.82 to 0.97; seven studies), but the results were not significant for lung cancer, prostate cancer and breast cancer.

There was no evidence of publication bias.
Authors' conclusions
There was a significant association between statin usage and cancer protection, but when the results were stratified by cancer location only one cancer type (colon) was significant.

CRD commentary
Inclusion criteria for the review were clearly defined and several relevant databases were searched. Publication bias was assessed and was not detected. There was potential for language bias, as only English-language articles were included. Attempts were made to reduce reviewer error and bias during study selection; it was unclear whether the same applied for data extraction. Quality assessment was not undertaken as no suitable quality score for case-control studies was found. The authors acknowledged the inherent risk of bias and confounding in case control studies. Studies were pooled using meta-analysis and statistical heterogeneity was estimated. There was significant heterogeneity between studies and limited detail was available from individual studies on type, dose and duration of statin usage, which together with the potential for biases within the studies urges caution when interpreting the results of the review. The authors noted some of these concerns, and their recommendations for practice and research seem appropriate.

Implications of the review for practice and research
Practice: The authors stated that the results should not be interpreted to promote use of statins as chemoprotective agents at this time.

Research: The authors stated that on the basis of the results of the review a randomised controlled trial with longer follow-up times than previously used was warranted.

Funding
National Cancer Institute (NIH/NCI K12 CA76917-08 and NIH/NCI R25T CA111898); Health Resources and Services Administration (#2 D12 HP 00023-04).

Bibliographic details

PubMedID
18414198

DOI
10.1097/CEJ.0b013e3282b721fe

Original Paper URL
http://journals.lww.com/eurjcancerprev/Abstract/2008/06000/Statins__and__cancer__a_meta_analysis__of.12.aspx

Indexing Status
Subject indexing assigned by NLM

MeSH
Algorithms; Antineoplastic Agents /therapeutic use; Case-Control Studies; Humans; Hydroxymethylglutaryl-CoA Reductase Inhibitors /therapeutic use; Neoplasms /etiology /prevention & control; Risk Factors

AccessionNumber
12008105749

Date bibliographic record published
31/03/2009

Date abstract record published
23/03/2011
Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.