Osteoarthritis and the postmenopausal woman: epidemiological, magnetic resonance imaging, and radiological findings
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CRD summary
This review assessed the effect of oestrogen replacement therapy (ERT) on articular cartilage in postmenopausal women. The authors concluded that there was weak evidence to suggest that ERT may protect against large joint osteoarthritis. However, a negative effect was seen on cartilage volume in postmenopausal women. The review conclusions are unlikely to be robust given concerns about the review methodology and the poor quality of the studies.

Authors' objectives
To assess the effect of oestrogen replacement therapy (ERT) on articular cartilage in postmenopausal women. The review also examined the effect of ERT on the incidence and prevalence of osteoarthritis (OA) in perimenopausal women, but these data are outside the scope of this abstract.

Searching
MEDLINE was searched from 1966 to March 2003; the search terms were reported. The reference lists from retrieved articles were also checked to identify additional studies.

Study selection
Study designs of evaluations included in the review
The authors stated that epidemiological studies were eligible.

Specific interventions included in the review
Studies of ERT were included in the review. No further details were given and the authors did not specify suitable comparator interventions. Details of the drug regimens used in the included studies were not reported. The included studies evaluated ever-use, current use and never-use of ERT, and as well as ERT use over various specified time periods (e.g. more than 4 and 5 years and undefined 'long-term').

Participants included in the review
Studies of perimenopausal and healthy postmenopausal women were included. The one study reporting relevant data in the review included women who had been taking ERT for 5 years or more. No other details about the participants were reported.

Outcomes assessed in the review
The authors did not specify which outcomes were eligible. However, the included studies assessed radiological and symptomatic OA of the knee; hip, hand and generalised OA; and articular tibial and patellar cartilage volume.

How were decisions on the relevance of primary studies made?
The authors did not state how studies were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they formally assessed validity. However, they did discuss some issues of study validity including adjustment (or not) for confounding factors.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.
extraction. For each study, the odds ratio (OR) with 95% confidence interval (CI) were extracted.

**Methods of synthesis**

How were the studies combined?
The studies were grouped by outcome (large joint OA, hand OA, incidence of OA and effects on articular cartilage) and combined in a narrative, with some accompanying tables.

How were differences between studies investigated?
Some potential differences between the studies were discussed.

**Results of the review**

Three cross-sectional studies (n=5,587) and two case-control studies (n=1,819) examined the relationship between ERT and large joint OA.

Three case control studies (n=1,069), one cross-sectional study (n=475) and one cohort study (n=415) examined the relationship between ERT and OA requiring arthroplasty.

Three cross-sectional studies (n=1,546) and one nested case-control study (n=60 pairs) examined the relationship between ERT and hand OA.

Two cohort studies (n=646) and one nested case-control study (n=60 pairs) examined the relationship between ERT and incident radiographic joint OA.

One cohort study assessed the effect of ERT on articular cartilage. The number of participants was not reported.

Relationship between ERT and the prevalence of large joint OA: two of three cross-sectional studies reported an association between ERT use and reduced radiographic knee OA (OR for current versus never users 0.31, 95% CI: 0.11, 0.93; based on one study) and radiographic hip OA (OR for users versus nonusers 0.62, 95% CI: 0.49, 0.86; based on one study). The other study found no significant association between ERT and radiographic knee OA.

Relationship between ERT and large joint OA: two case-control studies reported no statistically significant association between ERT use and large joint symptomatic and radiographic OA.

Relationship between ERT and OA requiring arthroplasty: two case-control studies, one cross-sectional study and one cohort study reported no statistically significant association between ERT use and large joint symptomatic and radiographic OA. One case-control study reported a borderline statistically significant association between end-stage hip OA and ERT use (OR 0.7, 95% CI: 0.5, 1.0).

Relationship between ERT and hand OA: three cross-sectional studies and one case-control study reported no statistically significant association between ERT use and hand OA.

Relationship between ERT and incident radiographic joint OA: two cohort studies (follow-up 4 and 8 years) reported no statistically significant association between ERT use and incident radiographic OA.

Effect of ERT on articular cartilage: a cohort of postmenopausal women who had received ERT for more than 5 years was followed over a 2-year period. Women taking ERT for more than 5 years were found to have more articular tibial cartilage (8%) than women who had never taken ERT, independent of age, bone size, years since menopause, age of menopause, body mass index and physical activity. However, no effect was seen on patellar cartilage or on change in cartilage volume, but the study had a very small sample size.

**Authors’ conclusions**

There was weak evidence from epidemiological studies that ERT may protect against large joint OA, but a lack of evidence about the positive effects of ERT on hand OA.
CRD commentary
This was a poorly reported review, based on broadly defined inclusion criteria for the intervention, participants, study design and outcome. The reviewers only searched one electronic database and reference lists, so relevant studies might have been missed and the findings may be subject to publication bias. It was also not stated whether any language restrictions were applied, thus the potential for language bias could not be assessed. The lack of methodological details means that it was not possible to assess whether selection or reporting biases present are likely to be present. Very little detail on the included studies was provided, in particular, the study population, methods used to select participants, intervention regimen or methods used to measure outcomes. Given the diversity of the studies, a narrative synthesis was appropriate. The limited search, lack of validity assessment, and reliance upon largely non-statistically significant findings from observational studies mean that conclusions about the efficacy of ERT are unlikely to be robust.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that the therapeutic effect of ERT on articular cartilage merits further investigation.

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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.