Background: Osteoarthritis causes significant pain and disability with no approved disease-modifying drugs. There is evidence emerging from pre-clinical and human studies suggesting metformin may have disease-modifying properties in osteoarthritis. Given its pleiotropic effects and safety profile, metformin has the potential to be a novel therapy for osteoarthritis.

Objectives: We systematically reviewed the evidence from both pre-clinical and human studies for the potential disease-modifying effect of metformin in osteoarthritis.

Methods: Ovid MEDLINE, Embase and CINAHL were searched between inception and June 2021 using MeSH terms and key words to identify studies examining the association between metformin use and outcome measures related to osteoarthritis. Two reviewers performed the risk of bias assessment and 3 reviewers extracted data independently. Qualitative evidence synthesis was performed. This systematic review is registered on PROSPERO (CRD42021261052).

Results: Fifteen (10 pre-clinical and 5 human) studies were included. Most studies (10 pre-clinical and 3 human) assessed the effect of metformin using knee osteoarthritis models. In pre-clinical studies, metformin was assessed for the effect on structural outcomes (n=10); immunomodulation (n=3); pain (n=4); and molecular pathways of the development of osteoarthritis (n=3). For human studies, metformin was evaluated for its effect on structural progression (n=3); pain (n=1); and immunomodulation (n=1). Overall, all pre-clinical studies consistently showed metformin having a chondroprotective, immunomodulatory and analgesic effect in osteoarthritis, predominantly mediated by adenosine monophosphate-activated protein kinase activation. Evidence from human studies, although limited, was consistent with findings in pre-clinical studies.

Conclusion: We found consistent evidence across pre-clinical and human studies to support a favourable effect of metformin on chondroprotection, immunomodulation and pain reduction in knee osteoarthritis. Further high-quality clinical trials are needed to confirm these findings as metformin could be a novel therapeutic drug for the treatment of osteoarthritis.

REFERENCES:

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Efficacy of Corticosteroids for Hand Osteoarthritis - A Systematic Review and Meta-Analysis of Randomized Controlled Trials

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Background: Hand osteoarthritis (OA) is a prevalent joint condition, causing disabling pain, reduced mobility, impaired daily functioning and quality of life (1-3). Corticosteroids are anti-inflammatory medications frequently used in musculoskeletal diseases. There is some evidence that corticosteroids may have a beneficial effect in hand osteoarthritis (4-6).

Objectives: To examine the efficacy of corticosteroids on symptoms and structural outcomes in hand osteoarthritis.

Methods: Ovid MEDLINE, Embase and Cochrane Central Register of Controlled Trials were searched from inception to October 2021 for randomized controlled trials investigating the efficacy of corticosteroids in hand osteoarthritis. Two authors independently screened records, extracted data, and assessed risk of bias using the RoB 2 tool. Standardized mean difference (SMD) or mean difference was calculated, and random-effects meta-analyses were performed.

Results: Of 13 included trials, three examined oral and ten examined intra-articular injection of corticosteroids on clinical outcomes. In meta-analysis, oral corticosteroids reduced pain (SMD=0.53, 95%CI -0.79 to -0.28) and improved functionality (SMD=0.37, 95%CI -0.63 to -0.12) at 4-6 weeks, and intra-articular corticosteroid injection improved function (SMD=0.48, 95%CI -0.90 to -0.06) at 4-6 weeks. Corticosteroids had no significant effects on pain and function over 3 months and 6-12 months. Two trials evaluated joint structure at 4-6 weeks: one study showed oral corticosteroids reduced synovial thickening, neither showed an effect on synovitis.

Conclusion: There was low-certainty evidence for a medium effect of oral corticosteroids on pain relief and small-to-medium effect on functional improvement at 4-6 weeks. Intra-articular corticosteroids showed low-certainty evidence for a medium effect on functional improvement at 4-6 weeks. Corticosteroids had no significant effect on any outcomes over longer term. No trials examined the effect of corticosteroids on disease progression. The role of corticosteroids in hand osteoarthritis is limited.

REFERENCES:

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