Glucosamine & Chondroitin: Natural remedies for osteoarthritis?

Clinical Question: Does glucosamine and/or chondroitin improve pain for patients with osteoarthritis?

Bottom Line: Glucosamine and chondroitin do not appear to be effective in higher-quality, larger and/or publicly funded studies. If studies at high risk of bias are included, at best ~10% more people will have meaningful reduction in pain with either treatment over 35-45% of people with placebo. There is reason to doubt the effectiveness of either treatments.

Evidence:
- Results statistically significant unless indicated.
  - Glucosamine:
    - 11 systematic reviews:1-11 glucosamine 1500mg/day versus placebo [2-25 randomized controlled trials (RCTs), 414-4963 patients]:
      - Proportion of patients attaining meaningful pain reduction (generally ≥30% reduced pain) from two meta-analyses:
        - Most recent meta-analysis (9 RCTs, 1643 patients).1 After 4-156 weeks:
          - 47% glucosamine versus 37% placebo, number needed to treat (NNT)=11.
        - Other analysis found similar.2
      - Change in 100-point pain scale: meta-analysis3 re-run by PEER. Baseline pain of 52, placebo reduced pain ~13, glucosamine reduced pain:
        - Larger RCTs, same as placebo.
        - Smaller RCTs, ~12 better than placebo.
  - Chondroitin:
    - 11 systematic reviews:1,3,4,10-17 chondroitin 800-1200mg/day versus placebo (6-18 RCTs, 362-4044 patients):
      - Proportion of patients attaining meaningful pain reduction:
        - Most recent analysis (9 RCTs, 2477 patients).1 After 12-48 weeks:
          - 57% chondroitin versus 45% placebo, NNT=9.
        - Other meta-analysis found no difference (1 RCT, 330 patients).12
      - Change in 100-point pain scale: meta-analysis3 re-run by PEER. Baseline pain of 56, placebo reduced pain ~19, chondroitin reduced pain:
        - Larger RCTs, ~4 better than placebo.
Smaller RCTs, ~12 better than placebo.

Combination:
- 6 systematic reviews\(^4,10-12,18\) glucosamine/chondroitin combined versus placebo:
  - Only one RCT examined meaningful pain reductions: effect similar to components alone.\(^12\)
  - Change in 100-point pain scale: not different from placebo.\(^3,18\)

Limits: mostly knee osteoarthritis studied.\(^1\) No benefit of glucosamine or chondroitin over placebo in publicly funded\(^1\), high-quality, or larger RCTs.\(^4,12\)

Context:
- Many meta-analyses report “standard mean differences” which are difficult to apply clinically and are not reported here.\(^2,4,5,7,9-17\)
- Pain studies should consider both percentage of patients reaching meaningful improvement and changes in scale.
- Adverse events infrequently reported.
- Osteoarthritis online calculator\(^19\) or PEER simplified decision aid\(^20\) can assist with patient-informed decision making.

Authors:
Anthony Train MBChB MSc CCFP, Samantha Moe PharmD, G Michael Allan MD CCFP

Disclosures:
Authors do not have any conflicts of interest to declare.

References: