Singh JA, Noorbaloochi S, et al. Chondroitin for osteoarthritis. Cochrane Database of Systematic Reviews 2015, Issue 1. Art. # CD005614

Design: meta-analysis of randomized clinical trials

Purpose of study: To estimate the effectiveness of oral chondroitin or of chondroitin combined with oral glucosamine for treating osteoarthritis (OA)

PICOS:

- Patient population: adults over 18 with OA of any joint
- Interventions: oral chondroitin alone or in combination with other oral drugs such as glucosamine
- Comparison intervention: Placebo or active medication such as NSAIDS, analgesics such a acetaminophen, opioid drug, or other comparator oral medications
- Outcomes:
    - Pain, using the pain subscale of the Western Ontario Osteoarthritis Index (WOMAC), or numeric rating scale of Visual Analog Scale (VAS)
        - A clinically meaningful threshold was defined as a 0.9 to 1.3 cm difference on a 0-10 cm scale
        - Percent pain responders, defined as the proportion with a minimal clinically important improvement (MCII) was also a major outcome
    - Physical function, such as with WOMAC function subscales, on a scale of 0-100, where higher scores indicate worse pain
    - Lequesne's Index, which combines pain, walking ability, and activities of daily living into a composite score
    - Radiographic joint space narrowing
    - Adverse events
    - Total withdrawals judged to be due to adverse events
    - Serious adverse events
- Study types: studies described as randomized

Brief summary of difficulties with the review:

- A total of 43 studies were included, but the presentation of most of the results includes descriptions of the findings of studies with high risk of bias, such as lack of allocation concealment
    - The combined results of all studies shows a treatment effect for chondroitin
    - However, a sensitivity analysis which considers only the studies with allocation concealment (Analysis 22.1 on page 258) shows no treatment effect of chondroitin
    - Other similar analyses show that studies with a lower risk of bias have treatment effects which are clinically small and often statistically insignificant

- The authors emphasized numbers needed to treat (NNT), as derived from taking the reciprocal of absolute risk differences, using a "Wells Calculator," which is not further described except to say that it is available at Cochrane Headquarters (perhaps in Ontario or in Australia); this may be a piece of physical equipment or perhaps a dedicated software, but its function is not adequately described
    - The Cochrane Musculoskeletal Group headquarters have been contacted to request information on the Wells Calculator
    - Additionally, NNT calculations from meta-analysis may be misleading if absolute risk differences are calculated from pooling the results of studies with differing risks of a treatment failure
- On page 11, the authors present a formula to estimate standard deviations from studies which do not provide them, but the formula requires standard deviations (or variances) from the individual studies from which they are lacking
    - It also is questionable whether a study which does not provide standard deviations is even worth considering as evidence
- Overall, the results of the review are not sufficiently robust to sustain an evidence statement that chondroitin is effective alone or in combination for treating osteoarthritis of the knee or hip