The Journal of Arthroplasty 30 (2015) 507–511

Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

Is Intra-Articular Hyaluronic Acid Effective in Treating Osteoarthritis of the Hip Joint?

Jay R. Lieberman, MD [a], Stephen M. Engstrom, MD [b], Olga Solovyova, BS [c], Carol Au, MA [d], James J. Grady, DrPH [e]

[a] Department of Orthopaedic Surgery, University of Southern California, Keck School of Medicine, Los Angeles, California
[b] Vanderbilt Orthopaedic Institute, Vanderbilt University Medical Center, Nashville, Tennessee
[c] University of Connecticut School of Medicine, University of Connecticut Health Center, Farmington, Connecticut
[d] Biostatistics Center, Connecticut Institute for Clinical and Translational Science University of Connecticut Health Center, Farmington, Connecticut
[e] Connecticut Institute for Clinical and Translational Science, University of Connecticut Health Center, Farmington, Connecticut

ARTICLE INFO

Article history:
Received 25 July 2013
Accepted 20 October 2013

Keywords:
osteoarthritis
hyaluronic acid
injection
hip
Synvisc

ABSTRACT

Hyaluronic acid (HA) injections are used to treat osteoarthritis of the hip but their efficacy has not been clearly established. The purpose of this meta-analysis was to determine the effect of HA injections on hip pain. There were twenty-three studies that met our criteria and the mean decrease in visual analog scores (VAS) was −1.97 (95% CL, 2.83 to −1.12, $P < 0.0001$). However, the clinical relevance of this change is difficult to determine since the decrease in VAS was only −0.27 in the six randomized trials in the study and the duration of follow-up in most studies was less than six months. Multicenter randomized trials are needed to determine the true efficacy of HA injections in decreasing pain associated with hip osteoarthritis.

Osteoarthritis of the hip joint is quite common and usually involves a slow deterioration of the joint with a gradual increase in pain and loss of function. Non-operative treatment measures include: oral agents such as acetaminophen, non-steroidal anti-inflammatory agents and neutraceuticals; corticosteroid injections; physical therapy, activity modification and the use of walking aids. However, the duration of pain relief and improved function with these different modalities are variable. Viscosupplementation with hyaluronic acid is approved for treatment of osteoarthritis of the knee in both Europe and the United States, but it is not yet approved for treatment of hip OA. The use of HA for treatment of OA of the knee is quite common and a number of meta-analyses have demonstrated the efficacy of this agent [1,2], but there is far less clinical experience with the use of viscosupplementation to treat osteoarthritis of the hip joint. In addition, there are a number of different formulations produced by different manufactures that are presently available to try to relieve OA of the hip. Despite the availability of these agents the role of HA in the management of osteoarthritis of the hip joint remains controversial.

We therefore performed a systematic review to address the following questions: (1) Does the treatment of OA of the hip via viscosupplementation with hyaluronic acid decrease pain in the hip joint compared to placebo or other agents? (2) What is the duration of the pain relief associated with HA injections to the hip? (3) Is one of the HA formulations clearly superior with respect to pain relief?

Search Strategy and Criteria

We conducted a search of the electronic databases Medline, the Cochrane Controlled Trial Review and Scopus from January 2001 to July 2011 (Fig. 1). For each database, several separate searches were performed. The results were compiled, and duplicate studies were eliminated. Initial search terms included the phrases "Hip Osteoarthritis AND Intra-articular hyaluronic acid"; "Hip Osteoarthritis and Viscosupplementation"; "Hip Osteoarthritis AND Hylan G-F-20"; "Hip Osteoarthritis and Sodium Hyaluronate"; "Hip Osteoarthritis and Hyaluronic Acid"; and "Hip Osteoarthritis and Hyaluronan." These terms were selected to provide consistency between search engines, and to provide targeted, yet comprehensive search results. We limited the search to original clinical research articles involving human subjects published in the English language, and then reviewed the titles and abstracts of the potentially relevant studies obtained from that search. If a review of the abstract suggested that the study had the appropriate design and involved human subjects, then we obtained the article and thoroughly evaluated it.

The search yielded 286 studies (Fig. 1). All review articles, case reports and articles related to the management of osteoarthritis of the hip that did not include the use of hyaluronic acid were excluded. We did include both prospective and retrospective study designs (Level of

The Conflict of Interest statement associated with this article can be found at http://dx.doi.org/10.1016/j.arth.2013.10.019.

Reprint requests: Stephen M. Engstrom, MD, Vanderbilt Orthopaedic Institute Vanderbilt University Medical Center 1215 21st Avenue South, Medical Center East, South Tower, Suite 4200 Nashville, TN 37232.

http://dx.doi.org/10.1016/j.arth.2013.10.019
0883-5403/

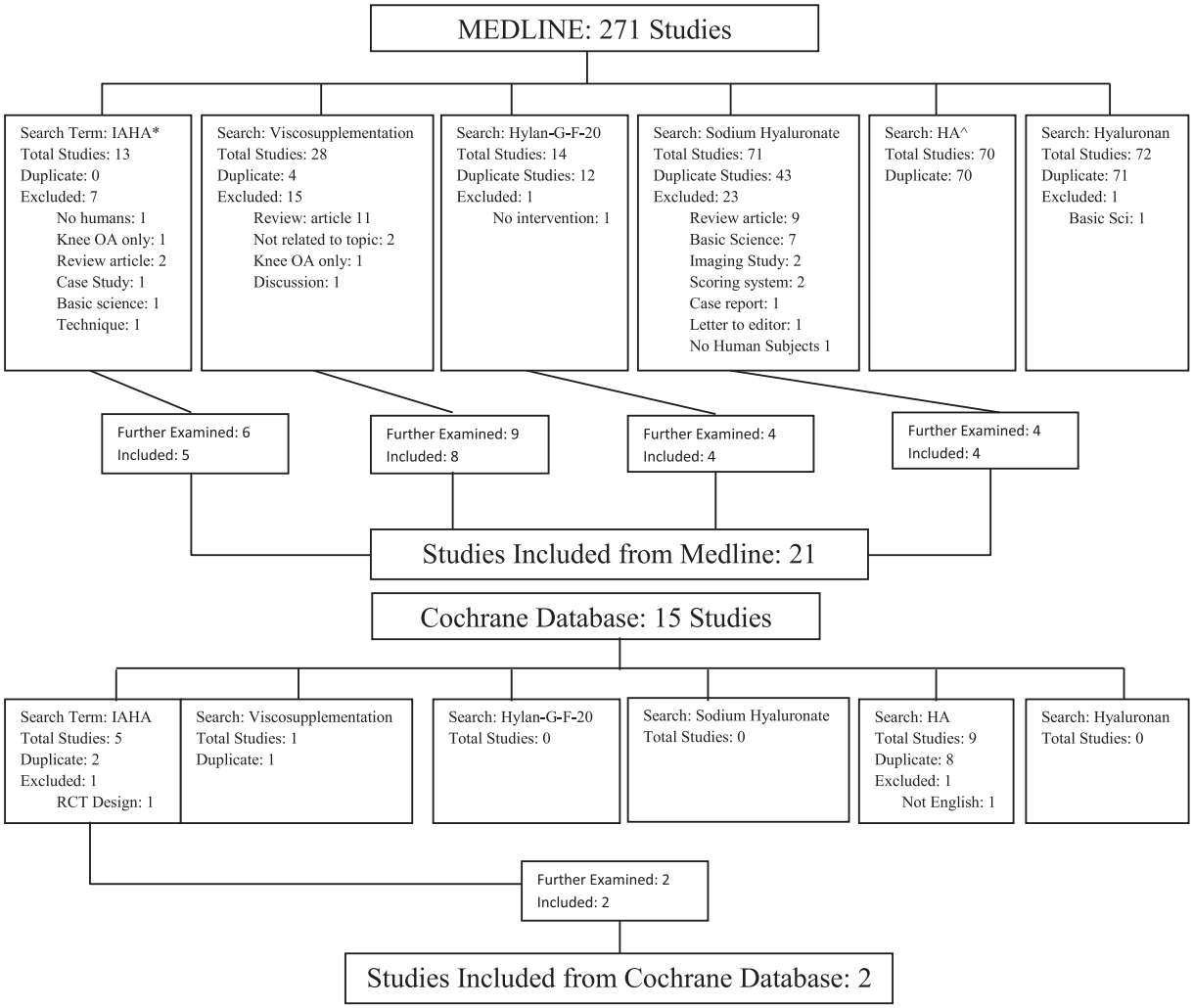

Fig. 1. A flowchart demonstrates the results of our search of the PubMed and Cochrane databases. It lists the number of articles initially identified, followed by a list of those excluded by a review of their abstract and a rationale for exclusion. Furthermore, it illustrates which articles were reviewed more thoroughly and those articles that were then excluded or included in the final manuscript on the basis of that analysis.

Evidence I, II, III and IV). The following inclusion criteria were established: (1) Patients had to be diagnosed with osteoarthritis of the hip joint; (2) patients had to receive hyaluronic acid for treatment of the hip pain. If the study was a randomized trial then at least one arm had to include treatment with hyaluronic acid; (3) and the minimum study size was ten patients. Any study that failed to meet all the inclusion criteria was excluded.

Twenty-three of 286 manuscripts met the overall inclusion criteria for this study (Fig. 1). Overall there were six prospective randomized controlled trials [3–8] (Level 2), fifteen prospective studies [9–23] and two retrospective studies [24,25] (Table 1). We assessed each study to determine if they were either retrospective or prospective and we assessed the overall power of each study to determine quality. A study was considered to be prospective if it started before the first patient was enrolled and the study was considered to be retrospective if it started after the first patient was enrolled.

One of the authors (SME) initially extracted relevant data from each study and then recorded them on a worksheet. These data were then confirmed independently for each study by two other authors (JG, CA). These data included the following: the number of eligible patients, the duration of follow up, number of patients lost to follow up, the scoring system used to evaluate the patients response to the treatment with hyaluronic acid and complications. Two of the authors (SME and JRL) independently assessed each manuscript to confirm whether it was retrospective or prospective in design, the number of patients involved, the classification system used to evaluate the response to the pain, the overall follow up time and the number of patients lost to follow up. If any discrepancies were noted between the evaluations by the authors they were resolved by conference.

Not all studies reported the actual VAS means and standard deviations as numbers. In these cases the means were estimated from figures. If the graphed VAS means in the figures had standard error bars, we estimated the standard deviations from the bars. For studies that did not report standard deviations [20], we used the average value of 2.5, rather than drop the study from the analysis. Additionally, not all studies had the same evaluation time points. The target endpoint for analysis was 3 months. When a study did not have a three month time point, we used the closest time point available.

Two of the authors (SME, JRL) independently graded the quality of each of the randomized trials using the Detsky Scale [26]. The Detsky Scale is a twenty-one point scale that is used to evaluate the quality of randomized trials based on a number of different criteria including: randomization; blinding; use of objective outcome measures; the presence or absence of well-defined eligibility criteria and statistical analysis. The Detsky Scores were then converted to a percentage and a score of 75% or greater was considered high quality. A score between 50% and 75% was moderate quality and a score less than 50% was defined as low quality [27].