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The Case For, and Against "Corticosteroid Distancing" in the Management of Knee Osteoarthritis

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A Quiet Discomfort Revealed

Intra-articular corticosteroid injections have long been a mainstay in the therapeutic toolbox of physicians managing patients with knee osteoarthritis (OA). The historical popularity of corticosteroid injections makes sense on several accounts – they are relatively inexpensive, readily available in most clinics, easily administered, and provide a quick treatment option with minimal apparent risk profile.

In recent years, however, there seems to be growing discontent with the use of corticosteroids in the management of knee OA. In a recent OrthoEvidence poll of 141 physicians, 75% expressed some level of concern with the use of intra-articular corticosteroid injections (Exhibit 1). The mounting rationale to reconsider the routine use of corticosteroids has been multifactorial, including evidence highlighting questionable efficacy, deleterious consequences, and the potential superiority of alternative interventions. Do these concerns truly reflect a changing landscape in the management strategies in knee osteoarthritis away from corticosteroids? Opponents of their routine use have been aptly calling for distancing measures for years. But the debate, at times, seems more emotionally charged than evidence-based. Let's construct the case against corticosteroids.

The 3 Arguments Favouring "Corticosteroid Distancing"

They don't work:

In a 2015 Cochrane review of 27 randomized controlled trials (RCT) comparing intra-articular corticosteroids to sham injection or no treatment, in patients with knee osteoarthritis (OA), short-term pain relief and functional improvement favoured corticosteroids. The pain improvement was short lived, however, as it was most pronounced in the first few weeks, minimal at three months, and not apparent at six months (1).

A more recent clinical trial comparing an intra-articular corticosteroid (triamcinolone) to saline in 140 patients with knee OA randomized patients to injections every three months for a duration of two years. At two years, there was no difference between the corticosteroid and saline placebo groups with respect to improvements in pain, function, and stiffness (2).

The more compelling arguments against the routine use of corticosteroids, however, may be driven by concerns around its unintended consequences.

They damage your cartilage:

The perceived association between corticosteroids and knee cartilage damage has surgeons most concerned regarding their use as an intervention for knee OA (Exhibit 1). Recent evidence from a clinical trial demonstrated that after two years of treatment with quarterly injections of intra-articular corticosteroids, cartilage loss (as read from an MRI) was approximately double in the corticosteroid group (0.21mm) compared to the saline group (0.10mm) (2).

Another study of approximately 4000 patients suggested that corticosteroid injections were associated with 1.6 greater odds and a 9.4% absolute increased risk of requiring knee arthroplasty surgery compared to those without corticosteroid injections (3). Literally interpreted, giving patients injections of corticosteroids causes sufficient damage to require knee arthroplasty at a much higher rate than those patients who don't receive these injections.

Physiotherapy is as good, if not better:

A third major criticism against corticosteroids is the growing evidence suggesting alternative non-operative interventions may have superior efficacy without the potential for undesired consequences.

A recent randomized controlled study compared the effects of physiotherapy to triamcinolone injection in 156 patients with knee OA. On average, the patients in the physiotherapy arm had about 12 (to be specific, 11.8) treatment visits and patients in the triamcinolone arm averaged about 3 (to be specific, 2.6) injections. At one-year follow-up, the study found physiotherapy was significantly superior to corticosteroid injection in terms of pain reduction and improved physical function (4).

Beyond physiotherapy, emerging network meta-analyses of RCTs suggest that high-molecular weight hyaluronic acid and platelet rich plasma may have greater benefit with respect to short-term pain and functional improvement versus saline, in comparison to corticosteroid versus saline (5).

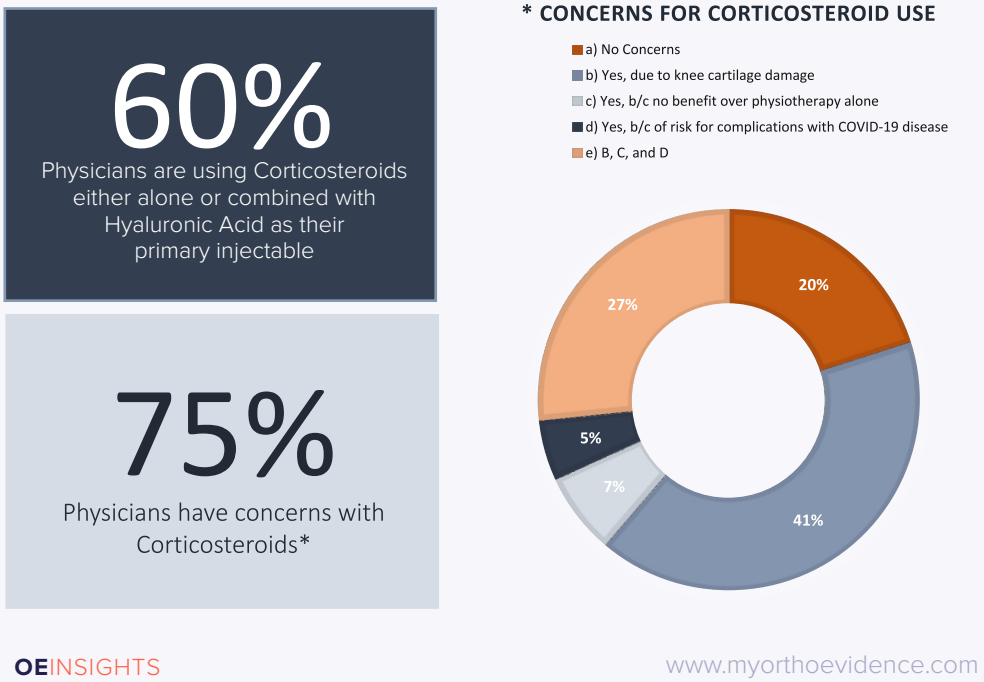

Exhibit 1: Corticosteroid Use: OrthoEvidence random sampling 274 members

Are Surgeons Exhibiting a Cognitive Dissonance?

Current practice patterns seem to highlight a cognitive dissonance in the use of injectable corticosteroids among orthopaedic surgeons. Despite 75% of physicians expressing concerns with corticosteroids, 60% of surgeons state that corticosteroids are still their most commonly used injectable in the management of knee OA (Exhibit 1). Aren't they aware of the evidence that supports a policy of "distancing"? It would appear that the high endorsement for use suggests a few alternatives. Either surgeons are dismissing the evidence against corticosteroids, or they have weighed it carefully against other purported advantages (lower cost being a big one).

Three Arguments Against 'Corticosteroid Distancing'

They actually work really well:

Intra-articular corticosteroids are not expected by most surgeons to be a long-term solution in managing patients with knee OA. In fact, for rapid onset, cost effective action, they are hard to beat. In patients requiring immediate, short-term pain relief, such as during acute flare-ups (with small knee effusions) or planned increased activity (i.e. travel), corticosteroid injections are a valuable choice. The Cochrane review among many other reviews have consistently demonstrated that corticosteroids have pronounced effects for short term periods (less than 3 months or so) (1). Any diminished effects beyond three to six months should not discredit their value as a "rescue" intervention in circumstances where short-term pain relief is necessitated. The most recent trial that suggested there was no benefit to corticosteroid injections versus saline injections at two years noted one important limitation. The authors wrote, "Pain was not measured within the 4-week period after each injection, during which benefits are known to occur." (2)

They are actually safe if used judiciously:

Intra-articular corticosteroids are not meant to be used every three months over multiple years. In fact, most surgeons wouldn't endorse the regimens of four injections per year over two years. A pragmatist might place little practical implication of the questionable clinical importance of a 0.11mm difference in cartilage loss detected by MRI (0.21mm corticosteroid group vs 0.10mm placebo group) over two years (2). Moreover, what does a O.1 mm change actually mean? Scientifically, a minimally important difference in MRI cartilage thickness that correlates to a clinically meaningful outcomes has not been established.

Of note, observational studies are inherently challenged with a greater risk of bias in comparison to RCTs. Why? Because they cannot control for all possible confounders (a variable that influences both the use of corticosteroids and the outcome variable, total knee arthroplasty). For instance, patients whose pain symptoms necessitate corticosteroid injections are potentially more likely to have advanced symptoms that inherently give them a higher likelihood of needing arthroplasty surgery (3). This underscores the importance of delineating and appreciating the difference between association and causation.

Nobody has ever said they should be used in place of physiotherapy:

Intra-articular corticosteroids are not meant to be first-line therapy. Numerous guidelines support this assertion. In practice, surgeons accept that intra-articular injections are not a substitute for physiotherapy and consideration should be given to corticosteroids only after first-line treatments have failed or special circumstances arise. In defense of large, definitive trials, a trial of less than a few hundred patients (156 patients to be exact) is rarely sufficient to draw a definitive conclusion. If the same trial was negative, skeptics would argue it's too small (suffering from a false negative finding risk). So, why wouldn't the opposite also be true? A small, positive trial may also be suffering from alpha error (a falsely positive finding). Don't take our word for it, read the provocative thesis by John Ioannidis who argues “Why all published research findings are false”. Central to his concerns lies the “small sample size study”(6).

Be it resolved that…

Justifying corticosteroids for all, or for none, is problematic at its core. Health care providers in the paradigm of evidence-based practice are expected to consider individual patient circumstances along with the best available evidence. A conscientious and judicious approach is an appropriate middle ground.

Guidelines, like those from the Osteoarthritis Research Society International (OARSI), endorse first line treatments for patients with knee osteoarthritis to include education, land-based exercise programs, and dietary modifications (core treatments), followed by topical anti-inflammatory treatment (1A recommendation). Alongside other interventions, intra-articular corticosteroids are second line after maximizing physiotherapy (1B recommendation) (7).

Patients with acute flare-ups, major upcoming events (travel), prolonged wait times for surgery, or elderly patients unfit for arthroplasty, all represent specific circumstances in which corticosteroid treatment may be a valuable treatment option (8,9). This should especially be considered in circumstances where the costs of other injectables are prohibitive.

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References

1. Jüni_P, Hari_R, Rutjes_AWS, Fischer_R, Silletta_MG, Reichenbach_S, da Costa_BR. Intra-articular corticosteroid for kneE osteoarthritis. Cochrane Database of Systematic Reviews 2015, Issue 10. Art. No.: CD005328. DOI: 10.1002/14651858.CD005328.pub3

2. McAlindon TE, LaValley MP, Harvey WF, Price LL, Driban JB, Zhang M, Ward RJ. Effect of intra-articular triamcinolone vs saline on knee cartilage volume and pain in patients with knee osteoarthritis. A randomized clinical trial. JAMA. 2017;317(19):1967-75

3. Wijn SRW, Rovers MM, van Tienen TG, Hannink G. Intra-articular corticosteroid injections increase the risk of requiring knee arthroplasty. Bone Joint J. 2020;102-B(5):586-92

4. Deyle GD, Allen CS, Allison SC, Gill NW, Hando BR, Petersen EJ, Dusenberry DI, Rhon DI. Physical therapy versus glucocorticoid injection for osteoarthritis of the knee. N Engl J Med. 2020;382(15):1420-29

5. Phillips M, Vannabouathong C, Devji T, Patel R, Gomes Z, Patel A, Dixon M, Bhandari M. Differentiating factors of intra-articular injectables have meaningful impact on knee osteoarthritis outcomes: a network meta-analysis. Knee Surg Sports Traumatol Arthrosc. 2020. Online ahead of print.

6. Ioannidis JPA (2005) Why Most Published Research Findings Are False. PLoS Med 2(8): e124. https://doi.org/10.1371/journal.pmed.0020124

7. Bannuru RR, Osani MC, Vaysbrot EE, Arden NK, Bennell K, Bierma-Zeinstra SMA, Kraus VB, Lohmander LS, Abbott JH, Bhandari M, Blanco FJ, Espinosa R, Haugen IK, Lin J, Mandl LA, Moilanen E, Nakamura N, Snyder-Mackler L, Trojian T, Underwood M, McAlindon TE. OARSI guidelines for the non-surgical management of knee, hip, and polyarticular osteoarthritis. Osteoarthritis Cartilage. 2019;27(11):1578-89

8. Bennell KL, Hunter DJ. Physical therapy before the needle for osteoarthritis of the knee. N Engl J Med. 2020;382(15):1470-71

9. Orchard JW. Is there a place for intra-articular corticosteroid injections in the treatment of knee osteoarthritis? BMJ. 2020;368:l6923