

Intra-Articular Steroids; How Soon and
How Often after the First Injection?Michael A. Malone^{1*}, Neha Kaushik¹ and Abdul Waheed¹¹Family & Community Medicine, Penn State Hershey College of Medicine, Milton S. Hershey Medical Center, USA

Article Information

Received date: Apr 26, 2016

Accepted date: Apr 26, 2016

Published date: May 05, 2016

*Corresponding author

Michael A. Malone, Penn State Hershey College of Medicine, Milton S. Hershey Medical Center, 845 Fishburn Road, Hershey, PA 17033-USA, Tel: +001-717-531-8187; Email: mmalone@hmc.psu.edu

Distributed under Creative Commons
CC-BY 4.0

Introduction

Intra-articular steroid joint injections have been used for decades for a variety of common medical diseases. The intra-articular steroids have been shown to be more efficacious than some of their precursors such as formalin, glycerin, lipiodol, lactic acid, and petroleum jelly [1]. Some of the indications of using steroid injections include bursitis, tendonitis, trigger points, and joint conditions such as rheumatoid arthritis and osteoarthritis. Although it is a common practice to keep the minimum interval time between injections up to 3 months, the exact time is controversial.

Current Guidelines and Evidence

There is no clear consensus from American Orthopedic Society for Sports Medicine or American Medical Society for Sports Medicine to specifically address the time duration between joint injections. The American College of Rheumatology 2002 recommendations for rheumatoid management suggest local steroid injections be given to relieve symptoms but not to inject the same joint more than once every 3 months [2]. However, the reasoning behind waiting for this duration is not evident through any randomized controlled studies. Additional recommendations state that if there is a need for numerous injections in the same joint or in multiple joints, an assessment of the treatment regimen should take place [2]. More recent guidelines since 2002 do not further comment on the interval between injection times with supplement clarity.

For many primary care providers and sports medicine physicians, caution is taken for concern of systemic effects of glucocorticoids. These include tendon rupture, Cushing's syndrome, radiologic deterioration of joints, fat necrosis, cataracts, and diabetes. There is some evidence from animal models that suggests cartilage breakdown of joint over time, and its acceleration through frequent glucocorticoid injections [3]. Interestingly enough, many clinical studies argue against this and frequent dosing of intra-articular injection has shown to provide cartilage safety. Gray and colleagues showed that patients with RA were able to absorb up to 10 injections per joint per year without any glucocorticoid-induced cartilage deterioration [4]. Clinical reports by Balch et al. showed that repetitive glucocorticoid injections were correlated with a low rate of accelerated osteoarthritic change [5]. This does not; however settle if the osteoarthritic changes that occurred were due to the natural progression of osteoarthritis or due to the numerous joint injections.

Numerous non-primate studies exist to support the use of frequent glucocorticoid intra-articular joint injections but primate-based randomized well-studied trials are lacking to show efficacy or lack thereof. For example, a study by Hills et al. was performed in equine models to determine if glucocorticoids could increase the secretion of lubricating surfactant, which in turn could reduce the tension at the cartilage surface, provide adequate cartilage hydration, and increase scavengers of free radicals. They found an increasing amount of surfactant production in the group receiving glucocorticoid injections compared to the control group receiving saline injections [6]. Other studies show that glucocorticoids not only increase surfactant levels but minimize the production capacity of collagenases and other metalloproteases which reduce cartilage destruction from rheumatoid arthritis or osteoarthritis [7, 8]. These studies suggest that intra-articular glucocorticoid therapy may in fact provide a protective mechanism against the inflammation of rheumatologic and osteoarthritic diseases which begs the thought that perhaps physicians are too conservative in their notion to provide only four injections per year or waiting as often as they do before considering reinjecting into the same joint.

There is some patient-based research on a small and nonrandomized scale, showing that repeated intra-articular glucocorticoid injections such as ten injections per year did not show as severe a deterioration on X-ray imaging in the majority of the patient-panel [9]. In another well-designed trial of 68 patients diagnosed with osteoarthritis, two groups received intra-articular glucocorticoids or placebo of saline solution every 3 months for 2 years, in a randomized fashion. Radiographic images and clinical assessments after 2 years did not demonstrate differing effects between cartilage thickness, proposing that repeated injections in OA patients is neither condor-

destructive or chondro-protective[10]. Many other small-scale studies exist to support that frequent glucocorticoid injection may offer chondro-protection. Some data suggest that intra-articular injections show improved signs and symptoms in RA and juvenile idiopathic arthritis compared to OA.

In a recent interview posted on the American Academy of Orthopedic Surgeons website, Dr. Constance Chu who co-authored a study on the effects of local anesthetics on articular chondrocytes in the March 2010 issue of *The Journal of Bone and Joint Surgery*—American articulated her views regarding effects of local anesthetics when combined with steroid injections as follows “The parallels between this research and research on cortisone injections are very important. Several studies back in the 1960s and 1970s—many performed by Henry J. Mankin, MD—suggested that corticosteroids might have a detrimental effect on the articular cartilage. But we continue to give steroid injections today, because they work so well to relieve the pain of osteoarthritis. But because of Dr. Mankin’s work, physicians are aware of the potential toxic effects on cartilage” [11, 12].

Conclusion

In conclusion, much controversy exists about the time frame between steroid injections into joints. The American Orthopedic Society for Sports Medicine and American Medical Society for Sports Medicine do not have specific guidelines of the timeline between joint injections. The 2002 American College of Rheumatology guidelines suggest waiting at least 3 months. This however is all very low level evidence, based mainly on animal models. Clinical evidence, on the contrary, indicates that frequent injections can minimize inflammation and serve as protective factor for cartilage while others show eventual degeneration and progression of disease. The effects of gluco-corticoid injections have variable effects on RA versus OA as well in terms of minimizing pain and eventual cartilage changes. The standard of care is to inject active and large joints affected by RA as often as once per month for three months, but with a limit of four injections per year for any given joint. For osteoarthritic joints, gluco-corticoid injections are performed every three months while no other therapy is available [13]. In patients who may go for total joint replacement, the frequency of injection may be increased although the systemic effects of steroid should be considered. All recommendations however are based on poor and old data. The need to have long-term well randomized clinical trials in human subjects is needed to determine appropriate time frame between joint injections as current recommendations from various expert institutions are unclear.

References

- Hollander JL, Brown EM Jr, Jessar RA, Brown CY. Hydrocortisone and cortisone injected into arthritic joints; comparative effects of and use of hydrocortisone as a local antiarthritic agent. *J Am Med Assoc.* 1951; 147: 1629-1635.
- American College of Rheumatology subcommittee on Rheumatoid Arthritis Guidelines. Guidelines for the management of rheumatoid arthritis: 2002 Update. *Arthritis Rheum.* 2002; 46: 328-346.
- Behrens F, Shepard N, Mitchell N. Alterations of rabbit articular cartilage by intra-articular injections of glucocorticoids. *J Bone Joint Surg Am.* 1975; 57: 70-76.
- Gray RG, Tenenbaum J, Gottlieb NL. Local corticosteroid injection treatment in rheumatic disorders. *Semin Arthritis Rheum.* 1981; 10: 231-254.
- Balch HW, Gibson JM, El-Ghobarey AF, Brain LS, Lynch MP. Repeated corticosteroid injections into knee joints. *Rheumatol Rehabil.* 1977; 16: 137-140.
- Hills BA, Ethell MT, Hodgson DR. Release of lubricating synovial surfactant by intra-articular steroid. *Br J Rheumatol.* 1998; 37: 649-652.
- Pelletier JP, Martel-Pelletier J, Cloutier JM, Woessner JF Jr. Proteoglycan-degrading acid metalloprotease activity in human osteoarthritic cartilage, and the effect of intraarticular steroid injections. *Arthritis Rheum.* 1987; 30: 541-548.
- Lohmander LS, Hoerner LA, Lark MW. Metalloproteinases, tissue inhibitor, and proteoglycan fragments in knee synovial fluid in human osteoarthritis. *Arthritis Rheum.* 1993; 36: 181-189.
- Balch HW, Gibson JM, El-Ghobarey AF, Brain LS, Lynch MP. Repeated corticosteroid injections into knee joints. *Rheumatol Rehabil.* 1977; 16: 137-140.
- Raynauld JP, Buckland-Wright C, Ward R, Choquette D, Haraoui B, Martel-Pelletier J, et al. Safety and efficacy of long-term intraarticular steroid injections in osteoarthritis of the knee: a randomized, double-blind, placebo-controlled trial. *Arthritis Rheum.* 2003; 48: 370-377.
- Chu CR, Coyle CH, Chu CT, Szczodry M, Sheshadri V, Karpie JC, et al. In vivo effects of single intra-articular injection of 0.5% bupivacaine on articular cartilage. *J Bone Joint Surg Am.* 2010; 92: 599-608.
- Porucznik MA. Raising a red flag on intra-articular injections. *AAOS Now.* 2010.
- Intra-articular injections for osteoarthritis of the knee. *Med Lett Drugs Ther.* 2006; 48: 25-27.