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Review Article

Prolotherapy Injections in the Treatment of Overuse Injuries

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Abstract

Prolotherapy is one of injection-based complementary medicine administrations, and recently have gained popularity in the treatment of sprained and degenerated ligaments, and damaged dense connective tissues structures. Overuse injuries are common debilitating problem among athletes and sports participants. Although there is no still a curative treatment modality, more efficient therapeutic approaches are needed for the management and the treatment of such conditions. The aim of this review is to present a concise data regarding to prolotherapy injections in overuses injuries.

INTRODUCTION

Prolotherapy injections, as a simple and cheap method, have been successfully used in the management of numerous musculoskeletal pathologies. The injected solutions consist of hypertonic solutions or local anesthetic agents. So, injections cause osmotic rupture of local inflammatory cells. Eventually, some growth factors emerged in the degenerated or damaged region, and then the formation of new collagen and subsequent healing occurs (1,2,3,4). Overuse injuries are common debilitating problem among athletes and sports participants. Although, various management options are available for these problems, there is still controversy about the most effective method (5,6,7). This review aims to deliver the actual use of prolotherapy injections in overuses injuries.

PREPARATION AND INJECTION PROTOCOL OF PROLOTHERAPY

So far, distinct concentrations and combinations of prolotherapy solutions are used in the scientific studies. There is still a controversy about optimal concentration and combination (8,9). In general, dextrose solutions in concentrations greater than 10% have been usually considered, because of only these concentrations induce an osmotic environment that may induce inflammatory cells and growth factors inducing the wound-healing process (10).

Lidocaine, sensorcaine and xylocaine are among the most used pharmaceutical agents in combination with prolotherapy (1,11,12). Therefore there is a need for further studies investigating optimal strategy of the injections for prolotherapy.

COMMON OVERUSE INJURIES

Epicondylitis

Epicondylitis is one of the common overuse injuries in athletes. It is usually associated with repetitive and forceful activities that cause repetitive microtrauma and a degenerative process (1). There are a few scientific studies which have promising results about this pathology. Scarpone et al. (1) used prolotherapy injections in the treatment of chronic lateral epicondylitis compared to placebo control. They obtained successful results in terms of pain intensity and grip strength in the long-term period. Afterwards Carayannopoulos et al. (13) comprised the effectiveness of prolotherapy with corticosteroid injections. Both of the groups obtained significant improvement; however there was no significant difference between the groups at 3 or 6 months. The real effectiveness of prolotherapy injections in athletes is still not known, therefore there is a still need for more randomized controlled studies have sports participants and more objectively outcome measures. The aforementioned studies were conducted with lateral epicondylitis, thus the efficiency of prolotherapy in medial epicondylitis is still unknown.

Rotator Cuff Lesions

Rotator cuff lesions are very common in athletes (14). There is a need for new methods in these patients (15,16). Lee et al. primarily used prolotherapy injections in the treatment of rotator cuff lesions resistant to conservative treatment (17). They declared successful outcomes with prolotherapy injections in terms of pain, disability, isometric strength, and shoulder of motion in patients with refractory chronic rotator cuff disease. Berthrand et al. used prolotherapy injections in the treatment of Rotator Cuff Tendinopathy in comparison with placebo saline injections, and showed that pain and patient satisfaction was significantly improvement, but there was no difference in the shoulder pathological healing when compared to control groups (18). Prolotherapy can be promising method for athletes with rotator cuff injury. There is need for studies investigated prolotherapy injections in the treatment of rotator cuff lesions of athletes.

Knee Collateral Ligaments

Collateral ligaments are the important structures of knee, provides medial and lateral stabilization. It is very common in athletes due to varus and valgus stress of knee (19). Ada et al. used prolotherapy injections in the treatment of medial collateral lesion of male rugby (20). He was completely healed with no residual

symptoms or functional deficit after 12 weeks of initial injection. In the control MRI that obtained 6 months after trauma; medial collateral ligament was well-healed, relatively homogeneous and Subchondral bone marrow edema was reduced.

Achilles tendinopathies

Overuse injuries are common in Achilles tendon due to repetitive trauma in athletics, soccer, volleyball, badminton and orienteering (21,22). Yelland et al. used prolotherapy injections single or combined with eccentric loading exercises in comparison with control that received eccentric loading exercises for chronic Achilles tendinosis (23). They obtained successful results with combined treatment.

Patellafemoral Pain Syndrome

It is one of the common injuries in all age groups. It is arisen with peripatellar or retropatellar pain, after physical activities. Overuse or overload, malalignment are the accused etiologic factors. In the late stages degeneration, thinning and softening of patellafemoral cartilage occurs, this resulted chondromalacia patella or osteoarthritis (24,25). Ross at al. used prolotherapy in 61 patients with chondromalacia patella in a retrospective study and declared successful outcomes in terms of improved the knee functions and pain relief (26).

Medial Tibial Stress Syndrome (MTSS)

It is one of the most common overuse injuries, and arisen with post-exercise pain especially in athletes (27). The studies have demonstrated that 13.1% of the sports injuries in the runners and 22% of the sports injuries of the aerobic dancers are MTSS (28). MTSS is major cause of pain, physical disability, and impaired quality of life. New evidence indicates that a spectrum of tibial stress injuries is likely involved in MTSS, including tendinopathy, periostitis, periosteal remodeling, and stress reaction of the tibia (29,30). Prolotherapy injections could be beneficial for this indication as its theoretical ability to healing or regeneration of tissues (31).

CONCLUSION

Prolotherapy is the successful injection based complementary treatment in the management of chronic overuse injuries. In spite of new development knowledge about prolotherapy injections, there is still need for further high-quality studies investigated optimal strategy of the injections of prolotherapy.

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