

Research article
Orthopaedics

STUDY TO EVALUATE THE EFFICACY OF STEROID INJECTION FOR TENNIS ELBOW AND TO UNDERSTAND THE CAUSE OF ITS FAILURE IN SOME PATIENTS

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Abstract:

Aim: Tennis elbow is a very common problem with numerous treatment options. Though a self limited disease it can be very disabling for some patients and they seek early recovery. We aim to evaluate the efficacy of local steroid infiltration in the treatment of tennis elbow and try to understand the causes for its failures in unsatisfied patients.

Material and methods: A prospective study done on 100 patients of tennis elbow who opted for local steroid injection after giving consent for the procedure. These patients were followed up at 2 weeks, 6 weeks and 3 months. They were evaluated with VAS pain score. At the end of 3 months the patients who were not having much relief were investigated with serum Vitamin D (25OH), Renal function test and Liver function test. Detailed history were also taken regarding the duration of symptoms before the injection and post injection physiotherapy compliance. Results: At the end of 3 months 86 patients were relieved of the disease (86 % efficacy) by a single injection of steroid. Whereas the remaining 14 patients were still having mild to moderate pain at lateral epicondyle on examination and were having trouble holding heavy object. All the 14 patients were having decreased serum Vitamin D (25OH) level. LFT and RFT were normal in all the 14 patients. Ten of the 14 patients (71.43%) were using tobacco in various forms. 12 of the 14 patients (85.71%) failed to follow the physiotherapy regime and did not do muscle stretching exercises. 8 out of 14 patients were having duration of symptoms more than 6 weeks (57.14%).

Conclusion: Local steroid injection is having very good efficacy in treatment of Tennis elbow. We should supplement the treatment with Vitamin D and the patient should avoid using tobacco and should follow post injection physiotherapy protocol for better results.

Keywords: Tennis elbow, Serum Vitamin D, steroid injection, Tobacco

Introduction

Tennis elbow is a common problem we see in our Orthopaedics out-patient department. Though named behind a famous sport, we hardly see a tennis player coming to us with this problem in central India. Mostly we get housewives, teachers, office and manual workers who are having lot of grasping, writing and screwing movement in their daily activities. Clinical diagnosis of tennis elbow is made when there is pain and tenderness localised to lateral epicondyle of humerus. The pain classically increases on making tight fist and on wrist extension against resistance. Degenerative process secondary to overuse is the pathology described behind it.^{1,2} There is also some angiofibrotic changes associated with it. According to anatomy it's an injury to the origin of extensor carpi radialis brevis (ECRB) muscle. Injury does not heal due to repeated use or overuse.

The management of Tennis elbow mainly rely on a conservative treatment. Strengthening and stretching exercises of the forearm muscles,³ rest and forearm bracing help alleviating the pain. There is no fixed line treatment offered by a primary care physician and a specialists which shows that the wide range of treatments options have shown to have benefit.^{4,5,6} As an additional step contributory biomechanical factors such as improper use of equipments in day today practice or inadequate working and exercising technique should be addressed and corrected. In secondary care, a steroid injection around the lateral epicondyle is often offered.^{7,8,9} There is evidence which shows this improves short-term (6-week) outcome, including pain to allow a quicker return to work.^{10,11,12}

Repeat injections however are not recommended as these, although scarcely reported can cause tendon rupture.

The administration of steroids injection requires special training. In rotator cuff tendinosis, a study comparing a local intralesional subacromial ultrasound guided steroid injection with a systemic steroid injection into the gluteal muscle showed no significant differences in short-term outcome.¹³ This suggests that an intramuscular steroid injection is as effective as an intralesional injection for rotator cuff disease. If this effect is translatable to lateral epicondylopathy, there are a number of potential implications: General practitioner would be able to administer systemic steroids as intramuscular injections without training; tertiary referrals and costs would be reduced and the procedure would cause less distress and pain to patients.

In our study after making the diagnosis depending on the patient preference we treated the patient accordingly. Local infiltration of steroid is a very easy, safe, fast and cheap way to help most of these patients. So patients do get agree to this option. Most of these patients get miraculous results, but few for unknown reasons fail to respond. We have conducted a prospective study on hundred patients who were diagnosed with tennis elbow and have opted for steroid injection as the first treatment. We wanted to assess the efficacy of the injection and to understand the reason behind its failure in some patients.

Material and methods

This was a prospective study conducted on 100 patients. Patients with symptoms of pain on palpation of the common extensor origin and

pain reproduced on resisted extension of the wrist with the elbow extended were eligible to participate provided they had no treatment in the preceding 3 months. All participants were aged over 18 years. A. Exclusion criteria included the following: trauma to the affected elbow in the preceding 6 weeks; patients with a history of elbow instability; previous elbow surgery; bilateral symptoms; other pathology involving the affected upper limb; coexisting cervical spine pathology; physiotherapy or steroid injection for the presenting condition within 3 months; patients already on oral/systemic steroids; patients with contraindications to injection therapy including patients with bleeding diatheses or on anticoagulant therapy, local or systemic infection, history of hypersensitivity to local anaesthetics and poorly controlled diabetes.

Random blood sugar and coagulation profile was done for all the patients before giving injection. In diabetic patients injections were given if the FBS was less than 150mg/dl and PPBS was less than 200 mg/dl. Injections were given after taking proper consent and under complete aseptic conditions. After giving injection patient was discharged the same day on 7 days course of NSAIDS, tennis elbow strap and physiotherapy regime. Visual Analogue Score for pain was calculated before giving the injection and then at 2 weeks, 6 weeks and 3 months. At 3 months the patients with VAS for pain score greater or equal to 4 were further investigated with serum Vitamin D (25OH) level, Renal function test and Liver function test. Detailed history was taken from these patients regarding duration of symptoms, any substance abuse and non compliance to the physiotherapy protocol and history of hypertension.

Data was collected and analysed with appropriate statistical tests.

Results

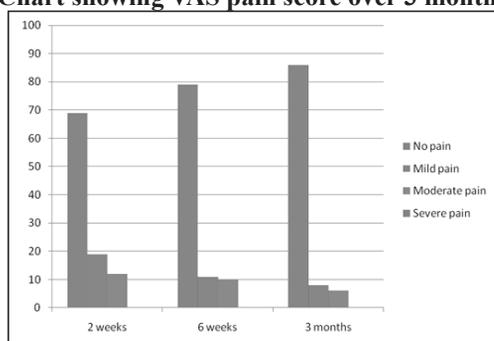
Of the hundred patients 42 were male and 58 were female. In 82 patients

the dominant hand was having the disease. Remaining 18 patients were having tennis elbow in non-dominant hand. Of the 100 patient VAS pain score was measured as shown in the figure below.

Figure 1: Chart showing the improvement of VAS pain score over 3 month follow up period.

VAS Pain score	Follow up at		
	2 weeks	6 weeks	3 months
No pain	69	79	86
Mild pain	19	11	8
Moderate pain	12	10	6
Severe pain	0	0	0
Total	100	100	100

Figure 2: Chart showing VAS pain score over 3 months follow up



At the end of 3 months 86 patients were relieved of the disease (86 % efficacy) by a single injection of steroid. Whereas the remaining 14 patients were still having mild to moderate pain at lateral epicondyle on examination and were having trouble holding heavy object. These patients were then investigated with Serum Vitamin D (25OH), renal function test (RFT) and liver function test (LFT). History was taken about duration of symptoms, for any substance abuse and physiotherapy compliance. On doing that we got some interesting finding. All the 14 patients were having decreased serum Vitamin D (25OH) level. LFT and RFT were normal in all the 14 patients. Ten of the 14 patients (71.43%) were using tobacco in various forms (8 male and 2 females). 12 of the 14 patients (85.71%) failed to follow the physiotherapy regime and did not do muscle stretching exercises (8 females and 4 males). 8 out of 14 patients were having duration of symptoms more than 6 weeks (57.14%).

Figure3: Table showing the possible associated factors for the failure of the treatment

No of patients	Serum Vitamin D (25OH)	Substance abuse (Tobacco)	Compliance to physiotherapy	Duration of the symptoms
8 patients	Decreased	Tobacco user	Non compliant	More than 6 weeks
4 patients	Decreased	No tobacco use	Non compliant	Less than 6 weeks
2 patients	Decreased	Tobacco user	compliant	Less than 6 weeks

Discussion

The natural course of the disease tennis elbow is benign and self-limiting. It means that the patient is going to improve with or without any treatment in 70%–80% of patients within 12 months.¹⁴ While there is wide consensus on this fact but a year is a long time for patients to wait as pain and disability affects their quality of life and also accounts for loss of economic productivity. There are multiple modalities of treatment available, conservative and operative, with varying success rate. The use of corticosteroid injections among other therapies for tennis elbow is more common due to its safety, easy accessibility and cost-effectiveness. Outcomes seem to vary with the length of follow-up. Systematic reviews of the literature conclude that corticosteroid injections for tennis elbow may result in short-term improvements only.

Smidt et al¹² reviewed 13 randomized clinical trials (RCT) that evaluated the effects of corticosteroid injections compared with placebo, injection with local anaesthetic and other conservative treatments. The evidence showed superior short-term pain relief (6 weeks) after corticosteroid injections but no conclusive benefit after that. Tonks et al¹⁵ designed a study with four treatment arms: observation only, single injection, physiotherapy and single injection plus physiotherapy. Only patients allocated to the injection group had significantly improved in all parameters at 7 weeks. Studies by Smidt et al¹² and Bisset et al¹⁶ showed early success with corticosteroid treatment in reduction of pain and grip strength. These benefits did not persist and there was a high recurrence rate in the injection group. Coombes et al⁵ reviewed 41 RCTs to assess

efficacy and safety of corticosteroids and other injections in lateral epicondylopathy. They concluded that while corticosteroids were superior to other treatment methods in the short-term non-steroidal injections are of more benefit in the long term.

Most of the studies support that giving a single shot steroid injection in a case of tennis elbow is very safe, easy and cost effective method to treat this disease. Our study also supports that with 86% satisfied patients. We also found various factors which have shown some strong association with the failure of treatment, as shown in the chart. Decreased serum Vitamin D (25OH), tobacco abuse, non compliant patient and duration of symptoms more than 6 weeks were found to be associated with failure of treatment. The association is shown the chart below.

Figure 4: Chart showing association of risk factors with failure of treatment.

Risk factors	Association in percentage
Decreased Vitamin D (25OH)	100%
Tobacco abuse	71.43%
Non compliant patient	85.71%
Duration of symptoms	57.14%

These 14 patients were again reassessed at the end of 3 months. Vitamin D supplements were given to all of them. Those who were using tobacco were advised to stop using it. They were suggested to follow the physiotherapy protocol for successful treatment. Further treatment (conservative or injection or surgery) was decided as per the patient's preference.

Due to its multiple advantages single shot steroid injection in tennis elbow is the preferred treatment option both for both patient and the treating surgeon. Mostly it gives us good result

but we also get some failure. Our study suggest that steroid injections are having very good efficacy (86%) in treating tennis elbow. And to avoid failures we need to do detail work up like getting Serum Vitamin D (25OH) and supplementing it, if found deficient. Patient is advised to not to use tobacco in any form for better results. And the post injection treatment and physiotherapy regime should be strictly followed to avoid failure. Our study has few short coming like small number of patients and its study design. A randomised case- control study over a large no of patients would give us a better correlation regarding the efficacy and risk factors for treatment failure.

Conclusion

Local steroid injection is having very good efficacy in treatment of Tennis elbow (lateral epicondylitis). We should supplement the treatment with Vitamin D supplements if required and should ask the patient to avoid any substance abuse. Compliance to the post injection physiotherapy regime is also very important and has shown better outcome.

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