ORIGINAL ARTICLE

Comparative analysis of management of tennis elbow with plasma rich protein and triamcinolone injection

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Abstract

Introduction: Tennis elbow are most common condition encountered during orthopedics practice and its management is challenge. Use of corticosteroids and several other injection are now available for the management of this condition.

Objective: To assess the outcome after giving steroid injection and plasma rich protein for the management of tennis elbow.

Study Design: Single blind, randomized clinical trial.

Setting: Department of Orthopedics, Bolan Medical College.

Duration: From January 2017 to December 2017.

Methodology: 100 patients were selected after fulfilling the inclusion criteria and were divided into two groups. One group received steroid injection and other group received plasma rich protein in aseptic condition. Data was initially entered on pre formed performa and later on SPSS 21.0 Version was used. Outcome was measured in terms of visual analogue score

Results: There were 50% males and 50% females, 52% of patients were between 20 to 40 years, 49% of patients belonging from urban population and remaining from rural area. Both the groups having equal effect upto 12 weeks, however there is recurrence of pain in corticosteroid group after 12 weeks. There was no statistically significance at 6th week of follow p=0.822 and 12th weeks p=0.423. However at 24th weeks there was a statistically significant difference p=0.002

Conclusion: Corticosteroid and plasma rich protein both are effective in reducing acute pain but to achieve long term results, plasma rich proteins should be preferred.

Keywords: Corticosteroids, lateral humeral epicondylitis, plasma rich protein, tennis elbow,

Introduction:

Tennis elbow is a type of tendinopathy .It causes severe pain and decrease the function of the tendon.Tendon degeneration having multiple causes like tendon over use,more mechanical stimulation, training faults, fatigue, environmental conditions and chemical stresses.[1] It is the tendinosis of the common extensor tendon.[2] This condition mostly affect individuals of age between 35 to 55 years and self resolving condition but in few patients it persists for long time which is refractory to treatment.[3] Its common name, tennis elbow, is somewhat of a misnomer because the condition is often work-related and occurs in athletes and non athletes alike. Acute onset of symptoms occurs more often in young athletes; chronic, recalcitrant symptoms typically occur in older patients.[4] Among the musculoskeletal disorders of the neck and upper limb,it is the second most common condition we encountered.[5] The treatment management vary from conservative to injections to surgical intervention. Different types of injections have been applied and tried at times for interval of it like botulinum toxin, platelet rich plasma, autologous blood injection, corticosteroid, pro-

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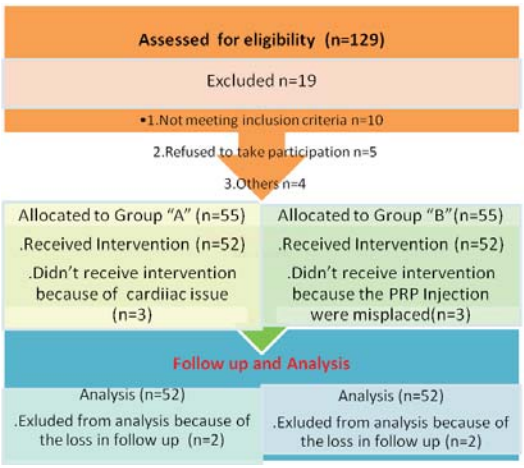
Table-1: Frequency of Demographic and Clinical Characteristics of patients

Characteristics		Group "A" Number (Percent)	Group "B" Number (Percent)
Age in years	20-40	23 (23%)	29 (29%)
	>40	27 (27%)	21 (21%)
Sex	Male	12 (12%)	8 (8%)
	Female	38 (38%)	42 (42%)
Side	Right	37(37%)	23(23%)
	Left	25(25%)	15(15%)
Place of living	Urban	29 (29%)	22 (22%)
	Rural	21 (21%)	28 (28%)
Addiction	Nil	21 (21%)	20 (20%)
	Smoking	17 (17%)	8 (8%)
	Snuffing	4 (4%)	8 (8%)
	Alcohol	2 (2%)	6 (6%)
	Sleeping pills	6 (6%)	8 (8%)
Co-morbidities	Nil	38 (38%)	44 (44%)
	DM	12 (12%)	10 (10%)
	Cardiac issue	8 (8%)	5 (5%)
	HTN	6 (6%)	5 (5%)
	Others	6 (6%)	6 (6%)



lotheraphy and hyaluronate injection. Steroid injections are mostly given locally as first line of theraphy, it has been found that these injection in tennis elbow can reduce pain for short interval of time but delay long term recovery.[6] The recurrence rate one year after a single corticosteroid injection is more than 50%, compared with a 12% recurrence rate in patients receiving a placebo injection.[7] Among the different treatment modalities, Extra corporeal shock wave theraphy was found to be more effective than placebo but less effective than steroid injections.[8] In systematic review, it was concluded that the majority of pre clinical studies showed the good results in using PRP for the management of tennis elbow because of its proliferation of tenocytes, collagen synthesis and the majority of pre-clinical studies show a beneficial effect of PRP on the proliferation of tenocytes, collagen synthesis and tendon healing process but it should be kept in mind that the platelet concentration should be less than 10^6 and the sample should not contain any white blood cell.[9] Yao-Hong et al did a comparative study for the management of tennis elbow. They give corticosteroid injection and botulinum injections at lateral epicondylitis and tender spots. It has been found that same results were found in patients in whom steroid or botulinum injection at lateral epicondylitis given while better and long term results found in patients in whom botulinum injection was given at tender spot.[10]

To best of my knowledge, no study was done in our population to compare the efficacy of steroids and Plasma rich protein in tennis elbow. The main aim of this study was to compare the effect of plasma rich proteins and corticosteroids in our population for the management of tennis elbow.

Materials and Methods:

This randomized comparative trial was conducted at Department of Orthopedics, Bolan Medical College. 100 patients of either age and sex were selected and were divided into 2 groups using lottery method after approval from hospital ethical committee and written informed consent from the patients between January 2017 to December 2017. All patients who presented with lateral epicondylitis or tennis elbow were selected in whom pain didn't relieve after medications and physiotheraphy while the patients who were allergic to steroids or having coagulopathies or deranged renal function tests or cardiovascular disease or having previous injections for the same pathology were excluded from the study. Group-A received single Inj Depomedrol 80mg along with 3cc of lignocaine while Group-B received 3cc of plasma rich proteins in aseptic conditions. All the patients were advised to give rest to the affected elbow for 2 weeks. The patients

Table-2: Visual analogue scoring Pre and Post Injection

VAS		Group "A"	Group "B"	P value
Pre Injection		7.2±1.8	7.1±1.6	0.34
Post injection	2 weeks	4.5±1.6	4.2 ±1.1	0.52
	6 weeks	3.6± 1.1	3.8 ±0.9	0.822
	12 weeks	3.4± 0.9	3.5 ±0.65	o. 0.423
	24 weeks	4.5±0.8	3.2±0.20	0.002

were given antibiotics for 3 days and analgesics. Visual analogue scoring was done pre injection and post-injection at intervals of 3 weeks, 6 weeks, 12 weeks and 24 weeks. All the patients were managed as an outdoor. Initially data was entered on a preformed performa and later on SPSS 21 Version was used for data analysis.t test was applied at 6th, 12th and 24th weeks.

Results:

There were 100 patients, 50% were male and remaining females with male to female ratio of 1:1 and mean age of 31.5±10.5 years. The patients were divided into two groups i.e. group "A" and group "B". The demographic profile of the patients are summarized in table-1. Group "A" patients received Inj. Depomedrol with lignocaine and group "B" received plasma rich proteins.

The pre and post injection VAS was determined at regular intervals in follow up. There was no significant difference upto 12th weeks but statistically significant difference was found at 24th weeks.(table 2)

Discussion:

Lateral epicondylitis is the most common cause of lateral elbow pain presenting to the orthopedic surgeon, with an estimated occurrence in 4 per 1,000 patients.[1,2] Every year 1% to 3% of adults are affected by lateral epicondylitis, with an equal prevalence between men and women.[11] In our comparative analysis we found same results of both groups upto 12 weeks but after 12 weeks there was a recurrence of symptoms in patients receiving steroid injections. However, no complications was found in both groups.

Corticosteroid injections are widely used in the management of lateral epicondylitis, and are based on the theory of inflammatory pathogenesis of the disease.[12] In an analysis of 6 high quality studies, it was found that the PRP having similar functions like steroid injection.[13] In another comparative study, an analysis was done in patients received PRP and surgical intervention. No statistically significant difference in pain and symptom improvement was found between two groups.[14]

In another trial, a comparison was done between autologous blood injection and corticosteroid injection. Autologous blood was more effective in short term than the corticosteroid injection but in long term same results were found.[15] Biobin Mi et al in their systematic review find that the steroid injections are helpful for short term period but not for long term. The plasma rich proteins are helpful in relieving pain and improving function in the intermediate term and long term.[16]

Alexios carayannopoulos et al did a comparative trial on prolotherapy versus corticosteroid Injections for the treatment of lateral epicondylosis. They found that Both prolotherapy and corticosteroid therapy were generally well tolerated and appeared to provide benefit of long duration[17] Hsieh et al did a comparative study between local injection of lidocaine and corticosteroid and found that no difference between the two groups in terms of pain.[18]

Andia et al did a systematic review and compare 15 trials of PRP with other injectables corticosteroid. Among these 15 trials it was found that PRP shows good results in long term as compared to corticosteroids and similar results as compared to autologous blood injection ,superior effect as compared to local anesthesia and saline injections.[19]

In one study in Pakistan, the patients were divided into two groups. One group received local ointment and another received corticorsteroid injection. Corticosteroid injection were better than local ointment.[20] Another study by Ashfaq et al found that the autologous blood injection is effective in relieving pain using visual analogue scoring and nirschl scoring system.[21]

There are few limitations in our study. We didn't follow our patients for more than 24 weeks. Also, we didn't compare with other modalities of treatment. Moreover we just used visual analogue scoring system and didn't mention other scoring systems. So, further studies needed in our population to give better results.

Conclusion:
Plasma rich proteins having long term effect as compared to corticosteroid injections and should always be considered in patients having chronic lateral epicondylosis.

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Role and contribution of authors:
Dr. Hamid ullah Khan, collected the data, references and did the initial writeup.

Dr. Ghulam Mustafa Wardak, collected the referenes and helped in introduction and discussion writing.

Dr Muhammed Tariq Hasni, critically review the article and made the final changes.

References:

1. Andia I, Latorre P, Gomez M, Burgos-Alonso N, Abate M, Maffulli N. Platelet-rich plasma in the conservative treatment of painful tendinopathy: a systematic review and meta-analysis of controlled studies. British medical bulletin. 2014;110(1).
2. McShane JM, Shah VN, Nazarian LN. Sonographically guided percutaneous needle tenotomy for treatment of common extensor tendinosis in the elbow. Journal of Ultrasound in Medicine. 2008;27(8):1137-44.
3. Ahmad Z, Siddiqui N, Malik S, Abdus-Samee M, Tytherleigh-Strong G, Rushton N. Lateral epicondylitis: a review of pathology and management. Bone Joint J. 2013;95(9):1158-64.
4. Brummel J, Baker III CL, Hopkins R, Baker Jr CL. Epicondylitis: lateral. Sports medicine and arthroscopy review. 2014;22(3):e1-e6.
5. Chiavaras MM, Jacobson JA, Carlos R, Maida E, Bentley T, Simunovic N, et al. IMpact of Platelet Rich plasma OVer alternative therapies in patients with lateral Epicondylitis (IMPROVE): protocol for a multicenter randomized controlled study: a multicenter, randomized trial comparing autologous platelet-rich plasma, autologous whole blood, dry needle tendon fenestration, and physical therapy exercises alone on pain and quality of life in patients with lateral epicondylitis. Academic radiology. 2014;21(9):1144-55.
6. Titchener AG, Booker SJ, Bhamber NS, Tambe AA, Clark DI. Corticosteroid and platelet-rich plasma injection therapy in tennis elbow (lateral epicondylalgia): a survey of current UK specialist practice and a call for clinical guidelines. Br J Sports Med. 2013:bjsports-2013-092674.
7. Foster ZJ, Voss TT, Hatch J, Frimodig A, Foster ZJ. Corticosteroid Injections for Common Musculoskeletal Conditions. American family physician. 2015;92(8).
8. Bisset L, Coombes B. Tennis elbow. BMJ clinical evidence. 2011;2011.
9. Kaux J-F, Drion P, Croisier J-L, Crielaard J-M. Tendinopathies and platelet-rich plasma (PRP): from pre-clinical experiments to therapeutic use. Journal of stem cells & regenerative medicine. 2015;11(1):7.
10. Guo Y-H, Kuan T-S, Chen K-L, Lien W-C, Hsieh P-C, Hsieh I-C, et al. Comparison Between Steroid and 2 Different Sites of Botulinum Toxin Injection in the Treatment of Lateral Epicondylalgia: A Randomized, Double-Blind, Active Drug-Controlled Pilot Study. Archives of physical medicine and rehabilitation. 2017;98(1):36-42.
11. Scher DL, Wolf JM, Owens BD. Lateral epicondylitis. Orthopedics. 2009;32(4).
12. Immerman I, Szabo RM. Steroid Injections. Tennis Elbow: Springer; 2015. p. 61-72.
13. de Vos R-J, Windt J, Weir A. Strong evidence against platelet-rich plasma injections for chronic lateral epicondylar tendinopathy: a systematic review. Br J Sports Med. 2014;48(12):952-6.
14. Ford RD, Schmitt WP, Lineberry K, Luce P. A retrospective comparison of the management of recalcitrant lateral elbow tendinosis: platelet-rich plasma injections versus surgery. Hand. 2015;10(2):285-91.
15. Kazemi M, Azma K, Tavana B, Moghaddam FR, Panahi A. Autologous blood versus corticosteroid local injection in the short-term treatment of lateral elbow tendinopathy: a randomized clinical trial of efficacy. American journal of physical medicine & rehabilitation. 2010;89(8):660-7.
16. Mi B, Liu G, Zhou W, Lv H, Liu Y, Wu Q, et al. Platelet rich plasma versus steroid on lateral epicondylitis: meta-analysis of randomized clinical trials. The Physician and sportsmedicine. 2017;45(2):97-104.
17. Carayannopoulos A, Borg-Stein J, Sokolof J, Meleger A, Rosenberg D. Prolotherapy versus corticosteroid injections for the treatment of lateral epicondylosis: a randomized controlled trial. PM&R. 2011;3(8):706-15.
18. Hsieh L-F, Kuo Y-C, Lee C-C, Liu Y-F, Liu Y-C, Huang V. Comparison between corticosteroid and lidocaine injection in the treatment of tennis elbow: a randomized, double-blinded, controlled trial. American journal of physical medicine & rehabilitation. 2018;97(2):83-9.
19. Andia I, Maffulli N. Update on Platelet-rich Plasma for Shoulder and Elbow Tendinopathy. Techniques in Shoulder & Elbow Surgery. 2017;18(3):91-100.
20. Ahmed GS, Ali M, Trago IA. Tennis elbow: role of local steroid injection. Journal of Ayub Medical College Abbottabad. 2012;24(2):84-6.
21. Ahmed A, Muhammad T, Alam W, Shah FA, Khan A. Autologous Blood Injection for Lateral Epidcondylitis of Elbow. Journal of Surgery Pakistan (International). 2016;21:1.