International Journal of Physical Education and Sports Sciences
Vol. 14, Issue No. 01, January-2019, ISSN 2231-3745

Rehabilitation of Chronic Lateral Epicondylitis- An Evidence Based Approach

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Abstract – Lateral Epicondylitis (LE) also known as Tennis Elbow is a lesion which affects the common tendinous origin of the wrist extensors because of chronic overuse injury leading to damage of the tendons of common extensors that joins the extensor muscles of the forearm to the humerus.

The purpose of this evidence-based clinical statement is to review the scientific evidence for the efficacy of various rehabilitation techniques management of chronic lateral epicondylitis. It focuses on the treatment of chronic lateral epicondylitis and recent advances in the field of physiotherapy for the management of chronic lateral epicondylitis.

As the primary physical impairment in LE is decrease is grip strength mainly because of pain and motor weakness, it is necessary to design a successful rehabilitation program which focuses on physical impairment and not only symptom.

Thus, the main aim of successful management of this condition is therapeutic exercise and electrotherapy, which focuses on reducing pain at initial stage and later on improves functional outcomes. Recent advance therapeutic techniques like manipulation, sports taping have shown good evidence in the rehab of LE mainly focusing of pain reduction. Reduction of pain in early stages helps in recovery as it motivates the client to continue physical therapy. Thus, recent advancement in physical therapy with techniques like manipulation, soft tissue release are having good clinical evidence in the management of LE as well as other musculoskeletal conditions.

Keywords - Chronic Lateral Epicondylitis, Recent Advances, Electrotherapy, and Evidence Based Approach

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1. INTRODUCTION

One of the most common lesions of the elbow is Lateral epicondylitis which is also termed as Tennis Elbow (Gouging & Rush, 2003). The clinical characteristics of LE is pain over wrist extensor muscles at or near lateral epicondyle of the elbow (Mani & Gerr, 2000). Though it is known as Tennis Elbow; it also occurs in non-tennis players. Since its first description in 1873, there is no clear idea about its pathoetiology and treatment (Mathew, 1999). LE is mostly due to work related condition which predominately requires wrist extensors use in repetitive manual tasks and sometimes idiopathic with its peak prevalence from third to sixth decade of life (Boyer, 1999), (Dimberg, 1987). In one of the study done by Christopher Greenfield stated yjay there is no association of lateral epicondylitis and the dominancy of the hand and also there is no correlation in incidence between men and women (Greenfield & Webster, 1988).

The pathology of lateral epicondylitis has been proposed to involve a tear of the tendon at origin of the extensor muscles from lateral epicondyle at the junction between muscle and bone and thus resulting slow due to lack of periosteal tissue overlying the bone area. Also, overuse or abnormal joint biomechanics may overload the healing tissue due to repetitive micro trauma and distort the scar tissue thus stimulate the free nerve endings which sufficiently evoke mechanical nociceptive pain (Bradly, et. al., 1997).

Thus, the main aim of this study is to review various literatures regarding rehabilitation of chronic lateral epicondylitis so that best rehabilitation protocol can be defined for the patients.

The broad classification of the treatment of lateral epicondylitis is shown in figure 1 below.

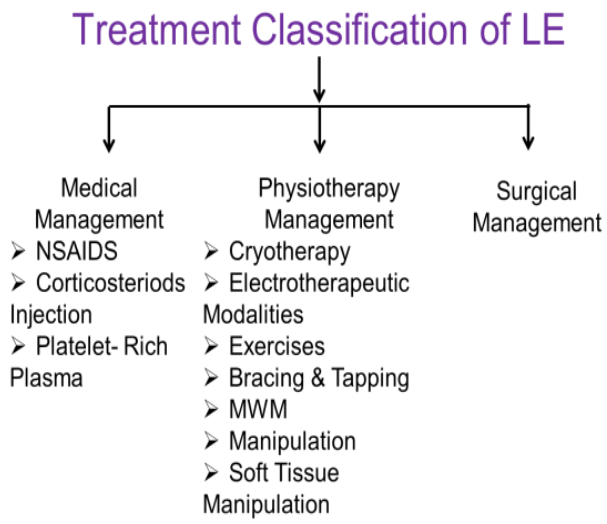

Figure 1

2. REVIEW OF LITERATURE

2.1 Medical Management

Medical management in lateral epicondylitis focuses on reduction of inflammation and improving the tendon strength. Based on current evidence below are important research done.

Burnham R et al in 1998**,** did a study on 14 samples with chronic lateral epicondylitis and concluded that short term relief in pain was achieved by 2% diclofenac gel in pluronic lecithin [8].

Tonks J, Pai S, Murali S. in 2006 did a prospective randomised study in treatment of tennis elbow which compared wait and see policy with physiotherapy alone, steroid injection alone and physiotherapy and steroid injection therapy combined. They recommended steroid injection as first line of management in tennis elbow as the patients return to work quickly after having it [9].

Gosens T et al 2011 did a trial with 100 subjects and 2 year follow up which compared effectiveness of PRP with corticosteroid injections in patients with chronic lateral epicondylitis and concluded that exceeds the effect of corticosteroids even after 2 years follow up in chronic lateral epicondylitis subjects [10].

2.2 Physiotherapy Management

As mentioned above in figure 1, physiotherapy management is comprised of various protocols which include cryotherapy, electrotherapy, exercise therapy and advance physiotherapy maneuvers like mobilization, soft tissue release techniques, bracing and tapping. In this article we will discuss all the domains of physiotherapy in detail.

2.2.1 Cryotherapy

Cherry E, Agostinucci J, McLinden J conducted a randomised controlled study to find the effect of cryotherapy and exercise on lateral epicondylitis with the main aim to know the effects of exercise alone, cryotherapy alone and combined effects of cryotherapy and exercise. The result of the study stated that exercise alone, cryotherapy alone and combination of both exercise and cryotherapy helps in reduction of symptoms of lateral epicondylitis [11].

2.2.2 Ultrasound

D'vaz A, Ostor A, Speed C, Jenner J, Bradley M, Prevost A, Hazleman B did a randomised controlled study onto find the efficacy of pulsed low-intensity ultrasound therapy (LIUS) for chronic lateral epicondylitis. They compared the effect of pulsed ultrasound versus placebo ultrasound at 12 weeks. The result of the study concluded that pulsed ultrasound achieved more improvement compared to placebo at least 50% at 12 weeks [12].

2.2.3 Laser

Zlatko Simunovic, Tatjana Trobonjaca, Zlatko Trobonjaca conducted a clinical study on 324 Patients with the main aim to compare trigger point application versus scanning application and combination of both in lateral epicondylitis. The study concluded that if laser applied correctly with individual energy doses, adequate medical education, clinical experience, and correct approach of laser therapists than combination of treatment with TPs and scanner give best treatment results [13].

Another similar randomised controlled trial study was done by Lam L, Cheing G which focused on effects of 904-nm Low-Level Laser Therapy (LLLT) in the lateral epicondylitis. Their main aim was to find whether 904-nm low level laser therapy has any beneficial effect in lateral epicondylitis or not. They came to a conclusion that LLLT in addition not only relieves pain but also improves functional outcomes like grip strength and subjective rating of physical function of patients with lateral epicondylitis [14].

2.2.4 Iontophoresis

Baskurt F, Özcan A, Algun C in 2003 had done a study titled comparison of effects of phonophoresis and iontophoresis of naproxen in the treatment of lateral epicondylitis with purpose to compare the effectiveness of iontophoresis done by application of naproxen (10%) and phonophoresis by application naproxen (10%) in the treatment of lateral epicondylitis. The result of this study supported electrotherapy stating that iontophoresis and phonophoresis with naproxen both are equally beneficial in lateral epicondylitis [15].

2.2.5 Extracorpeal Shockwave Therapy

Vulpiani Maria C in 2015 did a study in chronic lateral epicondylitis subjects with one year follow up which

compared extracorporeal shock wave therapy with cryoultrasound. The result of the study concluded that extracorpeal shockwave therapy better clinical therapeutic results at 6- and 12-month follow-up as compared to Cryo-US therapy [16].

2.2.6 Brace/Tapping

There are many literatures which support use of bracing and tapping in lateral epicondylitis, bracing and tapping relieve pain by unloading the extensor carpi radialis brevis muscle origin and thus, reducing the stress on it (Allahverdi, et. al., 2016), (Faes, et. al., 2006), (Struijs, et. al., 2004)

2.2.7 Exercise Therapy

One of the unique study in the management of lateral epicondylitis was done by Stergioulas A. in 2007 with the main aim of finding the efficacy of Low-Level Laser and Plyometric Exercises versus placebo laser. The result of the study supported laser with plyometric exercise protocol rather than placebo laser. This is one of the good evidence which supports plyometric exercises which helps in prevention of re-injury end of the treatment as well as at the follow-up [20].

Thus, Exercise therapy already has well-established evidence and also plays an important role in rehabilitation of lateral epicondylitis. Exercise therapy mainly focuses on isometric exercises for extensor muscles and recent evidences also support importance of plyometric exercises (Shimose, et. al., 2011), (Stasinopoulos, 2010).

2.2.8 Mulligan Mobilization

In 2010, Amro A et al conducted a study to find the effectiveness of mulligan mobilization with movement in lateral epicondylitis and they specifically focused on pain, grip strength and function of the patients. This study concluded that mulligan techniques when combined with traditional treatment have better outcomes than traditional treatment alone in lateral epicondylitis [23].

2.2.9 Manipulation

With mulligan mobilization with movement other manipulative techniques like wrist manipulation, cyriax manipulation also have significant role and evidence in rehabilitation of lateral epicondylitis.

This is shown in one of the study done by Goyal M, Kumar A, Monga M, Moitra M. titled effect of wrist manipulation & cyriax physiotherapy training on pain & grip strength in lateral epicondylitis patients. In this study wrist manipulation was found to have more efficacy compares to cyriax physiotherapy after three weeks [24].

The similar kinds of studies were done by Stasinopoulos D. in 2004 and Vicenzino B in 2007 which compared the effects of cyriax technique and joint manipulation respectively, they also concluded that there was reduction in pain and improvement in functional outcomes with these techniques [25,26]

2.2.10. Myofascial Release Technique

Apart from joint mobilization, soft tissue release techniques like myofascial release, muscle energy technique, active release technique, deep friction massage have also significant evidence in rehabilitation of lateral epicondylitis.

Following are some studies done:

A randomized controlled study with the aim of finding the efficacy of myofascial release technique on chronic lateral epicondylitis subjects considering pain, functional performance and grip strength as their outcome measures was done by Khuman P.R., Trivedi P., Devi S., et. al., in 2013. The result of the study showed significant improvement in patients with chronic lateral epicondylitis [27].

Another similar kind of study was done by Ajimsha M, Chithra S, Thulasyammal R. in 2012 which had aim of finding the effectiveness of myofascial release in the management of lateral epicondylitis in computer professionals and other similar study was done in 2014 by Parth Trivedi et with the main aim to find better treatment among active release technique and myofascial release technique in patients with chronic lateral epicondylitis.

All these studies showed that there is significant improvement in the patients of lateral epicondylitis in terms of pain, grip strength and functional performance [28, 29].

2.2.11 Muscle Energy Technique

Muscle energy technique (MET) is also one of the soft tissue release technique. Efficacy of MET in lateral epicondylitis is not much documented. There are very few literatures available and one such study is done by Küçükşen S, Yilmaz H, Sallı A, Uğurlu H in 2013 did a study with 1 year follow up which which compared MET and corticosteroid injections in chronic lateral epicondylitis patients. This study focused on both short and long term effectiveness of both the treatment procedures and concluded that at the end of 52 weeks MET appears to be an effective intervention in the treatment of LE [30].

2.2.12 Active Release Technique

Efficacy of Active Release Technique (ART) in tennis elbow was done by Harneet K., Khatri SM with the main aim to see the effectiveness of ART on functional performance and pain free grip strength in patients with tennis elbow and concluded that ART had positive benefits in the patients as it reduced the

pain and improved the grip strength and thus improving the functional performance [31].

Apart from this other studies which include a case study in the year 2006 and review article of active release manual therapy in 1999 have advocated use of active release technique (Howitt, 2006), (Schiottz-Christensen, et. al., 1999).

Mentioned above are conservative approach methods towards chronic lateral epicondylitis. Although there are surgical management techniques which aim to release ECRB muscle and remove adhesions thereby reducing pain and improving functional outcome.

2.3 Surgical Management

A study titled Surgical Treatment of Tennis Elbow; Minimal Incision Technique done in 2016 by. Morteza Nakhaei Amroodi et al. concluded that surgical option is only suggested after failed conservative management of tennis elbow [34]. Surgical approach in lateral epicondylitis is generally adopted in chronic cases with the aim of immediate pain relief and return to work in shorter duration (Kwon, et. al., 2017), (Baker, et. al., 2000).

3. DISCUSSION

Pain relief and restoration of muscle condition are primary objectives of rehabilitation. Exercise therapy which includes progressive resisted exercises concentrating on wrist and hand extensors is best for restoration of muscle condition

In order to treat pain and to facilitate pain free exercise a number of physical therapy modalities like US, LASER may be used. Thus, the recommended approach to clinical manual therapy in the management of LE should be based on the findings from physical examination and matching the treatment approach to the deficits highlighted in the clinical examination (Vicenzino, 2003). In one of the study done by Smidt N. et. al., in 2002 which compared the corticosteroids, physiotherapy and wait and see policy stated that patients should be made aware about the advantages and disadvantages of all the treatment options available for lateral epicondylitis and then adopt a proper protocol. They also suggested that physiotherapy has very minimal gain but it should not be ruled out [38]. G. W. Johnson et al in 2007 did a comprehensive review regarding the treatment options for lateral epicondylitis; in their study they concluded that medical management which includes NSAIDS, corticosteroids provide short term benefits and brace/tapping improves function. They also commented that exercise therapy had intermediate role and thus, evidences are mixed to comment which management is superior to another [39]. Thus, it is a strong need to develop a combined protocol for the rehabilitation of chronic lateral epicondylitis which not only reduces pain but also improves functional capacities and provide long-term benefits.

4. CONCLUSION

Evidence- based treatment of lateral epicondylitis should consist of NSAIDS, Brace and LASER in the early phases after injury. Manual therapy like Mulligan MWM and Soft Tissue release technique like MFR and MET are much more beneficial in chronic cases and long-term rehabilitation. There is very less positive evidence for Mill's manipulation of cyriax for long-term rehabilitation. Plyometric exercises can be included as it may train the individual/athlete to avoid recurrence. Minimal Invasive Surgery should be the last treatment of choice.

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