

PHYSIOTHERAPY INTERVENTIONS FOR ADHESIVE CAPSULITIS OF SHOULDER: A QUICK REVIEW

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Abstract: Adhesive Capsulitis is a prevalent disease but its management is challenging. In contrast, the current best scientific data about the use of physical therapy intervention is reviewed in this quick review. Furthermore, this article is intended to offer a brief overview of physiotherapy treatments for adhesive capsulitis. There are a number of physiotherapy interventions that have been proposed such as therapeutic exercises, interferential therapy and joint mobilizations are advised to reduce pain, increase range of motion (ROM) and function in adhesive capsulitis subjects. Low Level Laser Therapy was highly recommended for relieving pain but fairly recommended for function enhancement and not recommended for range enhancement. Microwave diathermy, therapeutic ultrasound was not recommended for relieving pain, enhancing ROM and function. Deep heat, Joint mobilization, Kaltenborn mobilization and Mobilization under anaesthesia can be used to ease pain and enhancing ROM. Efficacy of iontophoresis is still needed to check. Dry needling may relief the pain and increase ROM but there is need to check the efficacy of dry needling in adhesive capsulitis with large sample sized randomized control trial. In this situation, there is little consensus on the most effective treatment to decrease pain, improve ROM and shoulder function.

Key Words- Adhesive Capsulitis, Dry Needling, Mobilization, Electrotherapy, Stretching Exercise.

INTRODUCTION

Adhesive Capsulitis (AC) is a musculoskeletal condition also known as frozen shoulder and is characterized by functional restriction of both active and passive shoulder motions.(Zuckerman & Rokito, 2011) Moreover there is no definite etiology or underlying pathology associated with AC. Lundberg(Lundberg, 1969) (1969) was the first author who classified the AC into two types such as Primary and Secondary. Primary AC developed idiopathically and secondary develops with trauma. In fact, the primary idiopathic cases are the extremely familiar and the slightly understood.(Walker, K. L., Gabard, D. L., Bietsch, E., Masek-VanArsdale, D. M. & Robinson, 1997)

It was reported around 2 to 5.3 percent of the general population was affected with AC globally.(Kelley et al., 2013) The incidence of secondary AC linked to diabetes mellitus and thyroid disease are 4.3 percent and 38 percent respectively.(Kelley et al., 2013) Approximately 70 percent of AC subjects are women between the ages of 40 and 60(Page & Labbe, 2010); however, males with AC are at substantial risk of prolonged rehabilitation and severe impairment(Page & Labbe, 2010) because its management is very challenging. Furthermore this article is intended to offer a brief overview of physiotherapy treatments for AC.

PHYSICAL THERAPY INTERVENTIONS

a. Electro Physical Agents for AC

Electro Physical Agents (EPA) are used in physical therapy interventions (PTI) of AC that are focus to decrease pain and enhance function via an increase of different type of energies into the body.(Watson, 2010) In addition, several EPA exists and we can classify them as (a) Electrical stimulation agents include Transcutaneous Electrical Nerve Stimulation (TENS) and Interferential Therapy (IFT). (b) Thermal agents include Shortwave Diathermy (SWD), Microwave Diathermy (MWD) and Therapeutic Ultrasound (UST). (c) Non Thermal Agents include Low-Level Laser Therapy (LLLT).

TENS delivers electrical stimulation to activate the underlying nerves by means of electrodes mounted over the intact skin adjacent to the pain source.(Jones & Johnson, 2009) In AC, Dewan and Sharma(Dewan & Rohit, 2011) checked the efficacy of TENS and IFT and concluded that both TENS and IFT are effective in treating AC. IFT is more effective in decreasing pain severity and restoring function in the shoulder for people with AC.(Dewan & Rohit, 2011) IFT includes the interaction of two medium-frequency currents, resulting in a low-frequency 'beating' response in deep tissues.(Beatti, Rayner, Souvlis, & Chipchase, 2010) Literature suggested that it is effective in pain relief, function and ROM improvement.(Cheing, So, & Chao, 2008) Continuous SWD is the transmission of a continuous stream of electromagnetic short wave radiations to achieve deep heating effect in soft tissues.(Allen, 2006) Recently , deep diathermic heating along with stretching proved more effective than superficial heating to treat AC.(Leung & Cheing, 2008) MWD uses microwaves to heat superficial tissues than SWD. It is mainly used for heating up superficial muscles and joints such as the shoulder.(Steven, Mila, Lynn, James, & Allison, 2009) Literature showed that MWD along with physical exercises is not efficient in reducing pain and disability as compared to UST along with physical exercise programme.(Haque, Rahman, Yousuf, & Hasan, 2015) Using a crystal sound head, UST delivers energy to deep tissue sites through ultrasonic waves (at a frequency of 1 or 3 MHz and intensities between 0.1 watts / cm² and 3 watts / cm²). Treatment can be given in two ways, continuous and pulsed.(Allen, 2006) Literature did not recommend the further use of UST to lessen pain, increase ROM and function in AC.(Dogru, Basaran, & Sarpel, 2008) LLLT produces a light beam with the potential to transmit light energy to tissue depths under the dermis.(Peplow, Chung, & Baxter, 2010) Literature reported that by using LLLT, pro-inflammatory cytokines are decreasing and anti-inflammatory growth factors along with cytokines are enhancing that contributes to pain cessation.(Peplow et al., 2010) LLLT is a viable choice for the conservative management of shoulder pain caused by AC in the elderly, with a favorable clinical outcome of more than 90 percent and clinical effectiveness in both the short and medium term(David & Nga-Yue, 2015) since literature reported that LLLT on AC did not reliably achieve an increased range of motion.(van Breugel & Bär, 1992)

b. Iontophoresis for AC

In physical therapy, this technique was used to administer ionic medicines through the skin, mainly for a local effect.(Costello & Jeske, 1995) Jewell et al. and Ewald reported that iontophoresis (IP) has lower the probability of beneficial results which suggest to stop the use of this modality.(Ewald, 2011; Jewell, Riddle, & Thacker, 2009) In 2013, one study had compared the effectiveness of IP with calcium chloride plus SWD, IP with sodium chloride plus SWD and SWD alone and they found that IP with calcium chloride plus SWD and IP with sodium chloride plus SWD are effective in reducing pain in AC as compared to SWD alone.(Yigiter & Kerem, 2013) In this situation, high quality study is required to confirm the effectiveness of IP in AC.

c. Joint mobilization for AC

Many researchers have tested the efficacy of joint mobilization in AC. Although there is evidence that this could be of value, there is little evidence to support greater efficiency over other approaches.(Vermeulen et al., 2000; Vermeulen, Rozing, Obermann, Cessie, & Vlieland, 2006) Some authors reported successful mobilizations alongside home exercise program(Vermeulen et al., 2000, 2006) whereas few did not find it effective for controlling pain.(Chan, Hill, & Kerr, 2010) Similarly, some studies have indicated that mobilization along with exercises is successful for short- and long-term improvement of ROMs.(Johnson,

Godges, Zimmerman, & Ounanian, 2007; Vermeulen et al., 2000, 2006) However, Chan et al.(Chan et al., 2010) found no significant difference in ROM after mobilization, whereas with shoulder function, few studies found no significant change in mobilization efficiency,(Chan et al., 2010) while other studies suggested mobilization was effective.(Vermeulen et al., 2000, 2006)

d. Kaltenborn mobilization for AC

Kaltenborn proposed different degrees of mobilization such as mid-range and end-range mobilizations to enhance joint mobility and minimize pain.(Hammad et al., 2019) Jing-lan Yang et al stated that in AC, Kaltenborn Mobilization (KM) and Mulligan Mobilization with Movement (MWM) seemed more successful than Maitland Mobilization (MM).(Yang, Chang, Chen, Wang, & Lin, 2007) Vermeulen HM et al stated that KM (end range) was more helpful in enhancing the mobility of glenohumeral joint in AC.(Vermeulen et al., 2000) A research comparing Maitland and KM techniques for reducing pain in the shoulder and enhancing ROM in AC found that both groups experienced substantial reductions in post-intervention pain. The internal and external rotation ROMs in both groups increased significantly after intervention. However, there was no substantial difference in pain improvement or ROM between the groups.(Moon, Lim, Kim, & Kim, 2015) One recent study found that KM with thermotherapy was more effective than KM alone in AC.(Hammad et al., 2019)

e. Manipulation under anaesthesia for AC

Manipulation under anesthesia (MUA) requires the use of manual joint manipulation combined with general anesthetics.(West, Mathews, Miller, & Kent, 1999) Janda and Hawkins (1993) said that anaesthetic manipulation has no effect on the course of AC.(Janda, Hawkins, & Frcs, 1993) The effect of anesthetic treatment on the primary AC showed that initially subjects were substantially improved in ROMs but 59 percent of subjectss were listed as having no or mild disability only during follow-up at 3 months, 28.2 percent as having moderate disability and 12.8 percent as having extreme disability.(Dodenhoff, Orth, Levy, Wilson, & Copeland, 2000) Although, MUA is effective in terms of joint mobilization but literature reported many complications related to it as hemarthrosis, localized synovitis, disseminated synovitis, superior joint capsule rupture, anterior capsule rupture up to the infraglenoid pole, posterior capsule lesion, iatrogenic superior labrum anterior-posterior lesion, partial tears of the subscapularis tendon and anterior labral detachments.(Loew, Heichel, & Lehner, 2005)

f. Therapeutic exercises for AC

Therapeutic exercises has traditionally been a cornerstone of treatment for AC.(Ewald, 2011) Literature reported that studies utilized therapeutic exercises to treat AC subjects of different stages from I to III and these exercises are beneficial for pain relief and improved function at all stages.(Griggs, Anthony, & Andrew, 2000; Pajareya et al., 2004) Aggressive PTI can exacerbate pain and reduce adherence to the treatment regimen; therefore, care should be taken in subjects with a high degree of pain and stiffness.(Ewald, 2011) On the other hand, most of the exercises found to be effective in improving shoulder function(Griggs et al., 2000; Pajareya et al., 2004) but Diercks and Stevens reported supervised neglect to be superior than PTI in enhancing function in AC.(Diercks & Stevens, 2004)

g. Mirror Therapy for AC

Mirror therapy (MT) is a simple, inexpensive and most importantly, patient-centric type of treatment used to improve mobility in upper extremity disorders.(Baskaya, Erçalik, Kir, Erçalik, & Tuncer, 2018) Literature reported many studies related to MT for different neurological and musculoskeletal conditions.(Cacchio, De Blasis, De Blasis, Santilli, & Spacca, 2009) Cacchio et al. reported substantial post-treatment pain relief and improvement of upper extremity motor functions with MT in a randomized controlled study of 48 subjects with post-stroke of the upper limbs.(Cacchio et al., 2009) In a subject with an absent active wrist extension following a distal radius fracture, Altschuler and Hu observed improvement of wrist movements and functions after MT.(Altschuler & Hu, 2008) Moreover for AC, only one prospective randomized controlled study is available and that study concluded that MT applied to AC in combination with standard physical therapy methods can lessen pain and improve ROM, functions and quality of life in short term. This study was done with small sample size. Therefore, in order to confirm whether MT can contribute further to the

improvement of AC in combination with PTI; more studies with larger sample sizes, structured application techniques, well-defined optimal application time and mode and long-term follow-up are required in which MT 's effectiveness is supported by neuroimaging techniques.(Baskaya et al., 2018)

h. Dry Needling for AC

Dry needling (DN) is an invasive technique but it comes under the scope of physiotherapy.(Dommerholt, 2004) Literature reported only two published studies that investigated the use of DN for AC.(Clewley, 2014; Sukumar & Lawrence, 2014) In a case study of AC, Clewley et al, started DN on the third intervention session for trigger points in the upper trapezius muscle and elicit a localized twitch response with the goal of decreasing pain associated with them. Instantly after the first DN session, end range pain decreased from a 4/10 to a 0/10. By the fifth DN session, Quick DASH reported improvement in disability from 68 to 23 points.(Clewley, 2014) Sukumar and Mathias done a single blinded randomized controlled trial (RCT) with AC subjects. Outcome measures were Shoulder pain and disability and shoulder abduction ROM and they concluded that intramuscular manual therapy was more effective than PTI and it can be used as a primary intervention tool in treating AC. But there is need to conduct a RCT with large sample size and must include all shoulder ROMs.(Sukumar & Lawrence, 2014)

CONCLUSION

Numerous therapies have been proposed for AC such as PTI, SWD, IFT, KM, MUA and joint mobilizations that are advised to reduce pain, increase ROM and function in AC. MWD and UST were not recommended for relieving pain, enhancing ROM and function. DN, LLLT and Iontophoresis may relief the pain and increase ROM but there is need to check the efficacy with large sample sized RCTs. In this situation, there is still little consensus on the most appropriate treatment to decrease pain and enhance the ROM in AC.

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