

THERAPEUTIC EFFICIENCY OF PULSED ELECTRO MAGNETIC FIELD (PEFM) IN ADHESIVE CAPSULITIS PATIENTS

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ABSTRACT:

Objective The objective of the study is to analyse the efficiency of Pulsed Electro Magnetic Field (PEFM) for the management of adhesive capsulitis.

Setting and time Data was gathered from "Body Works ortho- Neuro-Sports Physical Therapy & Megnato therapy Center Karachi. Six months after the synopsis approval.

Sampling Simple random sampling technique

Method This is an experimental study conducted on 30 patients with frozen shoulder were randomly selected and treated with pulsed electromagnetic field therapy group. The participants who were willing join the study and including middle age (40-65 years). Participants suffering from pain at least 03 months diagnosed as adhesive capsulitis were selected and data collected from Body Works Ortho- Neuro-Sports Physical Therapy & Megnato therapy Center in Karachi Pakistan. Study was continuing for 6 weeks and a total number of 30 treatment sessions were given to each patient with 5 sessions per week. The data was analyzed by SPSS version 23 and T- test was applied. To analyse the pre and post treatment differences.

Results This study showed that 80% female are suffering from the adhesive capsulitis. And most effective shoulder is right one. SADPI score showed significant difference of pre and post treatment pain and disability at p value 0.005.

Conclusion PEFM is fruitful approach for the management of the adhesive capsulitis.

Keywords: Pain, shoulder disability, mulligan technique, PEFM, ROM.

INTRODUCTION:

Adhesive capsulitis (frozen shoulder) is a painful disorder that gradually limits mobility in all planes of the shoulder. In middle-aged and older people, it is the most common cause of shoulder discomfort and dysfunction. It's a condition in which the

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shoulder joint's range of motion is restricted, and discomfort occurs at the joint's extremes. Putnam and Codman were the first to describe it in 1982. (Shrivastava et al., 2011).

Adhesive capsulitis is a type of shoulder stiffness that is typically caused by idiopathic or post-traumatic factors. However, it is only referred to as adhesive capsulitis when it is of an idiopathic origin. There are several factors that have been associated with adhesive capsulitis, including being a female, being over 40 years of age, previous injury or immobilization, having diabetes, thyroid disease, a history of stroke or heart attack, autoimmune diseases, cervical spine disorders, or reflex sympathetic dystrophy syndrome. (Kazmi, S. A. et al., 2013).

Adhesive capsulitis results in pain and decreased mobility due to restricted movement of the shoulder girdle. The Mulligan technique is a manual therapy method used for peripheral joints that involves applying sustained pressure to reposition bone faults and promote joint movement, either actively by the patient or passively by the therapist. Pulsed Electromagnetic Field therapy, on the other hand, helps to promote healing and reduce pain and inflammation by stimulating the injured tissues.

Pulsed Electro Magnetic Field (PEMF) therapy is a non-invasive treatment option that utilizes electromagnetic waves to help manage a variety of health conditions, including adhesive capsulitis. Adhesive capsulitis, also known as frozen shoulder, is a condition characterized by pain, stiffness, and a decrease in the range of motion in the shoulder.

PEMF therapy works by exposing the affected area to pulsed electromagnetic fields, which can penetrate deep into the tissues and stimulate cellular activity. The electromagnetic fields generated by PEMF devices can help to reduce pain, improve circulation, and enhance the healing process. (Deveza, LA, 2019).

In the case of adhesive capsulitis, PEMF therapy has been shown to help relieve pain, increase range of motion, and improve overall function in the affected shoulder. This is due to the ability of

PEMF therapy to stimulate the cells in the shoulder and increase blood flow to the area, which can help to reduce inflammation and promote healing. (Sutbeyaz, S, et al., 2005).

PEMF therapy for adhesive capsulitis is typically administered using a portable device that can be easily applied to the affected shoulder. The treatment is non-invasive, safe, and well tolerated, making it an attractive option for individuals who are seeking to manage their symptoms without undergoing surgery or taking medication. (Aktas I et al., 2007).

It is important to note that PEMF therapy is not a cure for adhesive capsulitis and should be used in conjunction with other treatments, such as physical therapy and exercise, to achieve the best results. It is also important to consult with a healthcare provider to determine if PEMF therapy is appropriate for your individual case and to determine the best course of treatment.

The aim of this study is to analyses the effective ness off Pulsed Electro Magnetic Field (PEMF) therapy for adhesive capsulitis that can help to reduce pain, increase range of motion, and improve overall function in the affected shoulder, So that PEMF therapy can be used as a complementary treatment to help manage symptoms and enhance the healing process. (de Freitas DG, et al., 2014; Struyf F. et al., 2014)

METHODOLOGY:

30 patients of Adhesive Capsulitis were selected for this study. After taking written informed consent the data was collected from Body Work Orth-Neuro-Sport Physical Therapy Megnato therapy center Karachi through random sampling. Participants were 40 to 60 years age and had been suffering from adhesive capsulitis for 3 months and having 50% decrees of passive shoulder joint mobility were included in this study. PEMF therapy instrument, universal goniometer and hot pack were used for the data collecting. Shoulder pain and disability index (SPADI) were also observed. Data was analyzed through SPSS 21v. Descriptive and paired t statistics was applied.

RESULTS:

Mean age of the participant was 54.8 ± 5.85 , and mean BMI was observed to be at the border line of the overweight of the participants that is 26.2 ± 1.6 (Table 1)

Gender distribution showed the higher female patients that is about 67% and higher frequency of right effect shoulder, 80% was observed in patients (Table 2)

Pre and post treatment of Range of motion of shoulder showed the statistically significant flexing, abduction, and internal rotation degree at $p < 0.05$, and external rotation degree at $p < 0.005$ (Figure 1).

After applying the PMFE technique to the patients of frozen shoulder, SPADI score showed significant change in pain scale and disability scale between pre and post treatment of the Adhesive capsulitis patients (Figure 2)

Table No. 1:
Mean age and BMI of participants

Variable	N	Minimum	Maximum	Mean \pm SD
Age	15	48	62	54.8 ± 5.85
BMI	15	23	27	26.2 ± 1.6

Table No. 2:
Frequency of Gender distribution and effected shoulder of the Participants

	Variable	Frequency	Percent
Gender	Male	5	33
	Female	10	67
Effected Shoulder	Right Shoulder	12	80
	Left shoulder	3	20

Figure No. 1
Mean comparison of Pre and Post treatment of RoM of Shoulder

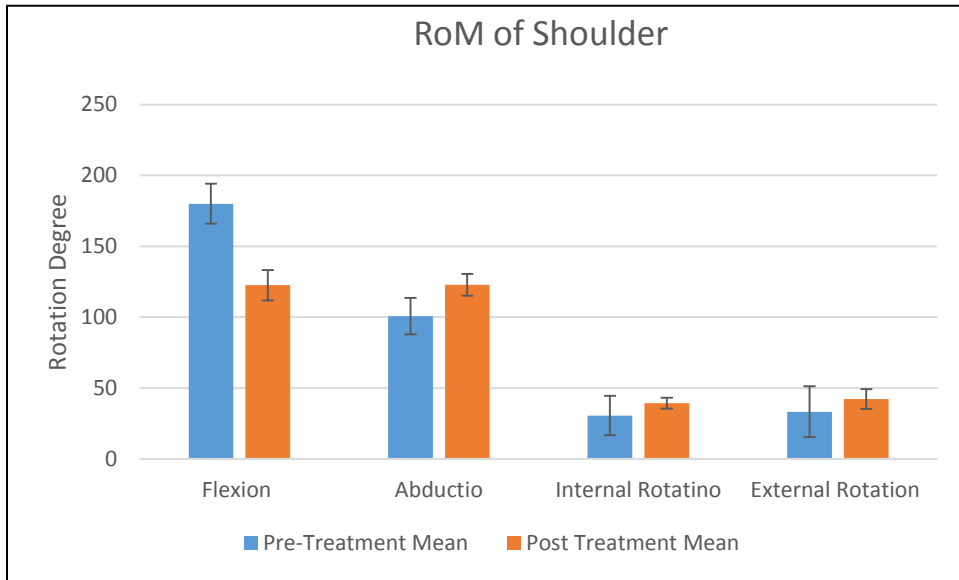
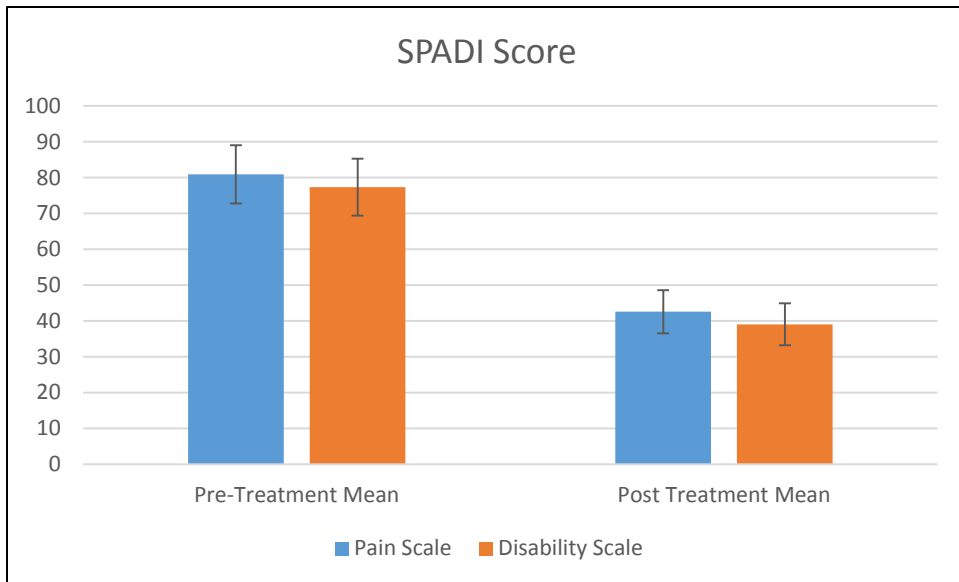


Figure No. 2
Mean Comparison of Pain and disability scale in SPADI



DISCUSSION:

The goal of the research was to compare the efficacy of the pulsed electromagnetic field therapy for the treatment of adhesive capsulitis patients with home exercises during a 6-week period. Patients were treated for 6 weeks at 5 sessions per week, with changes in pain, range of motion, and functional impairment measured before and after the intervention.

The present findings are consistent with those who examined the two mobilization procedures in 20 patients with idiopathic frozen shoulder and found identical pain, function, and shoulder mobility outcomes. It should be noted that it was unclear whether individuals with diabetic frozen shoulder were included in this research. (Shrivastava et al., 2011; Goyal, M. et al. 2013)

Also, the present findings are like those of researcher, however their findings are less obvious since just the mean difference was reported, and no p-value was revealed. (Kazmi et al., 2013)

However, the present findings contradict those of Goyal and others, who examined pain, function, and active and passive range of motion after 3 weeks of undergoing end range mobilization, Mulligan, and mixed mobilization treatments. (Goyal, M, 2013)

All prior research has shown the Mulligan approach to be beneficial as a therapy method, which is consistent with our results.

The use of PEMF in treating chronic pain in fibromyalgia and rheumatoid arthritis patients. Some studies have suggested that exercise can be effective in reducing pain and improving function, but not necessarily strength, in shoulder strengthening programs. The authors partly agree with this view, as the exercise strategy used in their research showed a decrease in pain, improved functional outcomes, and lower disability scores. (Gerdesmeyer L. et al., 2005; Park C. et al., 2015; Naomi M Shupak 2006)

Shockwave therapy had a positive impact on shoulder function, as well as self-reported discomfort and a decrease in calcification size, across all generations. PEMF with high intensity

was found to be even more beneficial. Park et al. also observed that PEMF used to treat frozen shoulder patients twice a week for six weeks showed a significant decrease in pain, as measured by the Visual Analogue Scale (VAS) and the Patient-Specific Functional Scale (PSFS). (Mohamed K. S. et al., 2018; Multanen J. et al., 2018)

ESWT improved the treatment of diabetic frozen shoulder by reducing shoulder pain and weakness (SPADI), with statistically significant improvements in shoulder flexion, abduction, and external rotation range of motion (ROM) (Rigato M. et al., 2002; John E. 2009).

Compared to sham therapy, active device treatment had no impact on pain, stiffness, or the FIQ score. There was also no correlation between the frequency of device usage and pain reduction with active ($r = 0.11$, 95% CI [0.31, 0.10]) or sham ($r = 0.10$, 95% CI [0.31, 0.12]) therapy. (Paternostro-Sluga T. et al., 2004)

The findings of this research in the group PEMF correspond with who examined the analgesic and therapeutic effects of PEMF of 100 Hz with modulated electromagnetic field on periarthritis shoulder patients. In individuals with periarthritis of the shoulder, PEMF was shown to be beneficial in lowering discomfort and enhancing range of motion. (Binder A. I. et al., 1984)

These findings support Paternostro-Sluga & Zoch's findings that PEMF was utilized as a conservative treatment for shoulder disorders with the goal of relieving local shoulder joint dysfunction. (Markove M. S. et al., 2001)

In a research discovered that PEMF stimulation (73Hz; 2.7mT) decreased discomfort and enhanced mobility in persons with rotator cuff tendinitis in their randomized double-blind research, which corresponded with the findings of the present investigation. They noticed that more than 70% of the patients in their study improved after receiving PEMF therapy. (Bassett C. A. et al., 1993)

PEMF was shown to have favourable effects on shoulder tenderness, pain ranking, range of motion, and function, a study found that PEMF was found to have beneficial effects on shoulder tenderness, pain ranking, range of motion, and function. (Prochazka M. D 2002; Ragav S, et al., 2019)

By increasing the permeability of the cell membrane, it was claims that pulsed electromagnetic field treatment improves blood circulation, oxygen delivery, Adenosine Triphosphate (ATP) synthesis, and aids the repair and regeneration of injured tissues. It also possesses analgesic and anti-inflammatory characteristics, which accounts for the improvement shown in our study. (Wadida He. et al., 2020)

Despite the strong benefits shown by the findings of this research, there are a few caveats. The following are some of the study's shortcomings. First, the therapy was only given for a short time, and further research is needed to determine the impact of a prolonged treatment. Furthermore, this research only looked at active range of motion, which is impacted by pain and muscular strength. Passive ROM, which indicates soft tissue flexibility, should be measured in future investigations.

Since this study results showed significant results and PEMF will be a fruitful approach toward the management of frozen shoulder.

CONCLUSION:

Based on the findings of this research, pulsed electromagnetic field therapy is beneficial in the treatment of frozen shoulder. Patients with frozen shoulder, all assessed variables (range of motion, pain, and shoulder disability index), resulting in a considerable reduction in the severity of frozen shoulder symptoms.

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