COMPARING THE EFFECT OF CONVENTIONAL PHYSIOTHERAPY AND RADIAL SHOCKWAVE THERAPY IN PATIENTS WITH CAPSULITIS ADHESIVE ON SHOULDER JOINT

ABSTRACT

Purpose: Capsulitis adhesive is a degenerative disease of soft tissues around the shoulder joint. Characterized by pain and limited movements in the shoulder joint. It has always been considered important because of the impact on the quality-of-life and long period of illness. Therefore, the use of noninvasive and safe techniques that can speed up the healing process of the disease is important.

The aim of the follow-up the effect on pain and range of motion (ROM) after conventional physiotherapy versus radial shockwave therapy (RSWT) in the same patients with Capsulitis adhesive.

Method: 10 patients were treated for 2 months with a conventional physiotherapy without improvement and followed 6 weeks treatment with RSWT. Visual analogy scale (VAS) used for pain assessment, goniometry for the ROM and Neer test, Upper limb Activity of daily living (ADL) to objectize the patient state before and after both therapies.

Results: The patient's condition has not improved after conventional therapy. The treatment with RSWT provides a significant reduction of pain, increase ROM in the shoulder joint and improve ADL for the upper limb.

Conclusions: Usage of RSWT alone is much better option compared to the conventional physiotherapy in patients with Capsulitis adhesive.

Key words: Capsulitis adhesive, physiotherapy, radial shockwave therapy

INTRODUCTION

Capsulitis Adhesive is an inflammatory degenerative disease of soft tissues around the shoulder joint. Characterized by pain and limited movements in the shoulder joint. The disease has chronic course and prolonged illness of patients.

Nontraumatic etiologies include degenerative changes, secondary dysfunctions, non traumatic injuries as well as muscle wasting or osteoporotic changes, where these predispose damage due to trauma. Age and excessive repetitive motions also lead to injuries and predispose damage.

Adhesive capsulitis (AC), often referred to as frozen shoulder is characterized by initially painful and later progressively restricted active and passive glenohumeral joint range of motion with spontaneous complete or near complete recovery over varied period of time.

This inflammatory condition that causes fibrosis of the glenohumeral joint capsule is accompanied by gradually progressive stiffness and significant restriction of range of motion (typically external rotation). In clinical practice it can be very challenging to differentiate early stage of AC from other shoulder pathologies (1).

Etiology remains unclear. Primary - onset is idiopathic. Secondary - results from a known cause or surgical event (2). Three subcategories of secondary frozen shoulder include systemic (diabetes mellitus and other metabolic conditions), extrinsic (cardiopulmonary disease, cervical disc, humerus fractures, Parkinson’s disease), and intrinsic factors (rotator cuff pathologies, biceps tendinopathy, calcific tendinopathy, AC joint arthritis) (3).

Adhesive capsulitis is often more prevalent in women, individuals 40-65 years old, and in the diabetic population, with an occurrence rate of approximately 2-5% in the general population, (3)(4)(5)(6)(7)(8) and 10-20% of the diabetic population (6)(7). If an individual has adhesive capsulitis they have a 5-34% chance of having it in the contralateral shoulder at some point. Simultaneous bilateral involvement has been found to occur in approximately 14% of cases (3).

Patients presenting with adhesive capsulitis will often report an insidious onset with a progressive increase in pain, and gradual decrease in active and passive range of motion (3)(5).

Adhesive capsulitis is considered to be a self-limiting disease with sources stating symptom resolution as early as 6 months up to 11 years. The literature reports that adhesive capsulitis progresses through three overlapping clinical phases: (1)(7)(9)(10)

Acute/freezing/painful phase: gradual onset of shoulder pain at rest with sharp pain at extremes of motion, and pain at night with sleep interruption which may last anywhere from 3-9 months.

Adhesive/frozen/stiffening phase: Pain starts to subside, progressive loss of glenohumeral motion in capsular pattern. Pain is apparent only at extremes of movement. This phase may occur at around 4 months and last till about 12 months.

Resolution/thawing phase: Spontaneous, progressive improvement in functional range of motion which can last anywhere from 1 to 3.5 years.
Physical therapy
For patients with early stages of adhesive shoulder capsulitis, physical therapy is the first line of treatment. In general, physical therapy is simultaneously combined with other treatment modalities, as a Cochrane study concludes that there is little overall evidence to support physical therapy alone in the treatment of adhesive capsulitis (11).

Extracorporeal shock wave therapy (ESWT) has recently drawn great attention as a non-surgical treatment(12). This therapy assists revascularization through the application of extracorporeal shock waves to the lesion, and reduces pain and improves function in the shoulder by stimulating or reactivating the healing process of connective tissues, including tendons and bones(13). While it is currently used for musculoskeletal diseases, such as calcific tendinitis and plantar fasciitis(14), few studies have focused on its therapeutic effects on adhesive capsulitis. In addition, the ESWT may have stabilized the tissues by stimulating and reactivating the healing process of the tendons and their surrounding tissues by creating new muscle fibers through facilitating the secretion of angiogenic substances around the affected region and increasing blood flow to the region(15).

MATERIALS AND METHODS
It concerns 10 patients with primary frozen shoulder according to Lundberg classification. Stage 2 stiffness according to Reeves.(16) The patients have complaints of pain and limited movements in the shoulder joint more than 4 months. In the baseline data: VAS for all patients were 10.

ROM : All 10 patients were with 50% reduction of extension, flexion, abduction, adduction, external rotation and internal rotation in glenohumeral joint.

### Capsule model of the ROM restriction in the glenohumeral joint.(17) (table.1)

<table>
<thead>
<tr>
<th>Degree of disfunction</th>
<th>Reduction</th>
<th>External rotation</th>
<th>abduction</th>
<th>Internal rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>mild</td>
<td>20</td>
<td></td>
<td>10</td>
<td>Normal, with pain</td>
</tr>
<tr>
<td>moderate</td>
<td>60-70</td>
<td></td>
<td>45</td>
<td>10-15</td>
</tr>
<tr>
<td>severe</td>
<td>90-100</td>
<td></td>
<td>70-80</td>
<td>30</td>
</tr>
</tbody>
</table>

This is a severe degree of disfunction of ROM.
Neer test: positive
ADL for upper limb: Score 1 - Patient carried out only part of the activity, but has to be greatly supported.
A course of conventional FTR was 2 months and included:
1/НМИП, 50 Hz, 0,2 s 2/10 15 min 15 procedures
2/НФТ 0-100 Hz, 10 min and 80-100 Hz 15 min 15 procedures
3/Cryotherapy 15 procedures
4/Active analytical kinesiotherapy 30 min 15 procedures
5/Ultrasound with gel, 0,3 W/sm2, 7 min 15 procedures

After conventional FTR, we start only RSWT for 6 weeks. The classification of the degree of disfunction on shoulder joint was moderate to severe.

Shockwave treatment parameters: In 4 trigger points with beam applicator with 1,8 bar ,600 shocks, 10 Hz. After 3-th procedure treatment parameters was 2,5 bar, 1000 shocks, 10 Hz. Therapy was 1 time per week, for 6 weeks.

**RESULTS**
Reported results after 2 months conventional FTR:
VAS for 7 patients were 10. VAS for 3 patients were 8.

ROM: 7 patients have not improvement. 3 patients have 10% improvement of extension, flexion, abduction, adduction, external rotation and internal rotation in glenohumeral joint.
Neer test: positive

ADL for upper limb: Score 1 - Patient carried out only part of the activity, but has to be greatly supported.
No reported side effects. There remains a severe degree reduction of ROM on shoulder joint.

Results after 6 weeks of RSWT:
VAS: 3 patients were 8 points, 7 patients were 4 points.

ROM: 3 patients have 10% improvement. 7 patients have 100% improvement of extension, flexion, abduction, adduction, external rotation and internal rotation in glenohumeral joint.
Neer test: negative for 7 patients.

ADL for upper limb: Score 4 - Normal for 7 patients. The patient performs the activity effectively with normal strength and speed. Score 2-for 3 patients.
No reported side effects. Mild degree reduction of ROM on shoulder joint for 3 patients and normal volume of ROM on shoulder joint for 7 patients.
Long-term results after 3 months follow-up:
VAS: 7 patients were 0 points. 3 patients were 5 points.

ROM: 3 patients have 10% improvement. 7 patients have 100% improvement of extension, flexion, abduction, adduction, external rotation and internal rotation in glenohumeral joint.
Neer test: negative

ADL for upper limb: Score 4- Normal for 7 patients. The patient performs the activity effectively with normal strength and speed. Score 3-for 3 patients.
No reported side effects. Mild degree reduction of ROM on shoulder joint for 3 patients and normal volume of ROM on shoulder joint for 7 patients.
VAS data before and after bought treatments. Fig. 1

ROM in percent before and after bought treatment. Fig. 2

Upper limb ADL scale before and after bought treatments. Fig. 3
DISCUSSION
After two months conventional FTR 70% of patient had reduction of pain and 10% increase ROM in 30% of patients. Upper limb ADL no improvement.

After RSWT 100% of patients had reduction of pain and 70% of patients had 100% ROM. Significant improve upper limb ADL.

After 3 months follow up all patients had additional reduction of pain and improvement of ROM and improvement of upper limb ADL. Usage of RSWT alone is much better option compared to the conventional physiotherapy in patients with Capsulitis adhesive.

CONCLUSIONS
According to the findings of this study. RSWT has positive effects on acceleration of the healing process of frozen shoulder. RSWT is more effective treatment than conventional physiotherapy. Considering the significant side-effects of other therapies such as surgery, patients with frozen shoulder can take advantage of RSWT because of its noninvasive, safe nature, low costs, no need for hospitalization, fewer visits of patient in the hospital, and the lack of significant adverse events during the treatment.

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ORGANIZATIONAL MANAGEMENT CAPABILITY AND EMPLOYEE SATISFACTION ASSESSMENT AT MATERNITY HOSPITALS IN MONGOLIA

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ABSTRACT
Background: Management capability index presents the management assessment of any organizations. Therefore, we aimed to compare Mongolian maternity hospitals with the ones that have and have not implemented the quality management system.