



**Research Article**

**AN EXPERIMENTAL STUDY OF SAME EXERCISE PROTOCOL WITH AND WITHOUT THE SUPERVISION OF PHYSIOTHERAPIST FOR FEMALE COMMUNITY WITH ACUTE MECHANICAL LOW BACK PAIN**

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**ABSTRACT**

**Objective:** Mechanical low back pain remains the second most common symptoms related reasons for seeing a physician. 85% with experience and episode of mechanical low back pain at some point during their lifetime.

**Design:** Quasi-experimental and Pre & Post-test type.

**Setting:** The study was conducted at SRM Medical Hospital & Research Center, Kattankulathur.

**Procedure:** Patients were randomly selected and were divided into 2 groups as group A and group B. Group A patients performed the exercise programme under the supervision of physiotherapist (clinic) and group b patients performed the exercise programme without the supervision of the physiotherapist (home).

**Results:** There is a significant difference between VAS and Oswestry disability score in group A and group B, it shows statistically significant reduction of pain in Group A.

**Conclusion:** This study concludes that the treatment with following proper principle in the supervision of physiotherapy (Group A) is more effective than the treatment given to the patients without the supervision of physiotherapist.

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**INTRODUCTION**

Generally mechanical low back pain remains the second most common symptoms related reasons for seeing a physician. 85% with experience and episode of mechanical low back pain at some point during their lifetime. Fortunately , the LBA results for the vast majority 2-4 weeks, for individuals younger than 45 years, mechanical low back pain represent the most common cause of disability and is generally associated with work related injury<sup>1</sup>.

The lifetime prevalence of mechanical LBA in India 60-80%, the prevalence of serious mechanical LBA (Persisting greater than 2 weeks) is 14%. Of all cases mechanical LBA, 70% are due to lumbar strain or sprain<sup>1</sup>. Mostly women from 30-60 years are affected commonly. 10% due to age related degenerative changes in discs and facets. 4% due to herniated disc, 4% due to osteoporotic compression fractures, and 3% due to spinal stenosis. All other causes accounts for less than 1% of cases<sup>19</sup>.

The purpose of the study is to determine the effectiveness of the protocols either in clinic or at home and thereby assess the patient suffering from low back pain, and to draw the maximum available benefits from the best protocols.

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The main principle to be followed during the exercise protocol is positioning, duration, fixation, endurance. These factors are investigated by physiotherapist depending upon the condition of the patient's ability; I took effort to see whether these principles are followed properly at home.

**Pathophysiology**

The pathophysiology of mechanical LBP remains complex and multifaceted. Multiple anatomic structures and elements of the lumbar spine (example bones, ligaments, tendons, disc and muscles) are all suspected to have a role<sup>2</sup>. Many of the components of lumbar spine have sensory innervations that can generate nociceptive signals respective response to tissue damaging stimuli. Repetitive, compressive loading of discs in flexion (lifting) put the disc at risk for an annular tear and internal disc rupture. The contents of annular fibrosis (nucleus pulposus) may leak through these tears central fibres of the disc are pain free, so early tear may not be painful<sup>2</sup>.

They suggest that chemical causes may play a role in the production of mechanical LBP. Components of nuclear pulposus notably the enzyme phospholipase A2(PLA2) has been identified in surgical removed disc herniated material. This PLA2 act directly on neural tissues or it may be orchestral a complex inflammatory response that manifest as LBA<sup>4</sup>.

Glutamate, the neuro excitatory transmitters, has been identified in degenerated disc proteoglycan,has found to defuse

to the dorsal ganglion (DRG) affecting glutamate receptors<sup>17</sup>. Substance P is present in affected neuron, including the DRG and is released in response to noxious stimuli such as vibration and mechanical compression of the nerve steady, cyclic or vibrator loading includes laxity and creep in the viscoelastic structures of spinal elements<sup>5</sup>. The creep does not recover fully in vivo cat model, even in when rest periods are equal in duration to the loading period.

The concept of biomechanical degenerative spiral has an appealing quality and is gaining wider acceptance. This concept postulates the breakdown of annular fibres allows PLA2 and glutamate, and possibly other as - yet unknown compounds, to leak in to the epidural space and defuse to the DRG<sup>6</sup>. The weekend vertebra and disk segment become more susceptible to vibration an physical over load, resulting in compression DRG and stimulating release of substance P. Substance P , in turn stimulates histamine and leukotriene release, leading to an altering of nerve impulse transmission<sup>7</sup>. The neurons becomes sensitized further mechanical stimulation, possibly causing ischemia, which attracts polymorph nuclear cells and monocytes to areas that facilitate further disc degeneration and produce pain<sup>16</sup>.

### **Pathomechanics**

The strain comes about by excessive motion, the structures farther from the centre of motion must become strained first since the strain producing force operates as a longer lever arm.

In forward flexion the sequence should therefore be: supraspinous, the interspinous ligaments, the ligament flava, the capsular ligaments, the posterior longitudinal ligaments and finally the disc<sup>8</sup>.

In backward extension the situation is different because impingement and compression forces now come in to consideration for all structures lying behind the centres of motion as well as structures lying in front of it. The anterior longitudinal ligament would then be under tension stress<sup>9</sup>. The sequence of compression stresses is reversed: namely the disc, the articulation and the final process.

In side bending the tension stresses which are created on the convexity should involve in sequence the quadrates lumborum and lateral musculature, the sacrospinalius, the intertransverse muscles and ligaments<sup>10</sup>.

In rotation the sequence would also I concentration direction from the long to short rotator muscles, then to the interspinous muscles and ligaments, the ligament flava, the articular capsular ligament and the disc<sup>11</sup>.

## **MATERIALS & METHODOLOGY**

### **Materilas**

Exercise mat or couch  
Towel  
Pillow

### **Methodology**

#### **Research Design**

A 2week experimental study design was chosen to determine the effectiveness of Exercise program in clinic versus ex's program at home in acute mechanical low back pain.

### **Setting**

This study was conducted in Departmet of Physiotherapy, Srm General Hospital, for the patients under supervision of physiotherapist.

### **Sampling**

The sampling technique used in this study was simple random sampling. Totally 20 subjects were selected and were randomly allotted in two groups (Group A and Group B) consisting 10 subjects in each group.

- Group A- Exercise program under the supervision of physiotherapist.
- Group B- Exercise program without the supervision of physiotherapist.

### **Inclusion Criteria**

- Age : 30 to 40
- Gender : female
- Education on the school level at least
- Occupation: housewife
- First episode of attack
- Duration of illness 2 weeks
- Economically middle class

### **Exclusion Criteria**

- Male patient
- Nerve root involvement
- Spinal fracture
- Sensory involvement
- General debridement
- Chronic low back pain
- Any major surgery
- Un co-operative patients

### **Assessment Tools Used**

1. Visual analogue scale
2. Oswestry disability questionnaire

### **Outcome Measures**

- Pain intensity measured by means of VAS
- Functional disability by Oswestry disability questionnaire.

### **Procedure**

The subject were selected in SRM hospital, with complain of low back pain and conformed to have only mechanical low back pain by visualising the x-ray by excluding the joint pathology. And there by to exclude the nerve pathology bilateral SLR and slump test were performed on them and it exits a negative results. These tests conforms the exclusion of nerve pathology.

Hence the patient suffering from mechanical low back pain without any neurological involvement were selected as samples for this study, the subjects were clearly explained about the study and they voluntarily accept to be the subjects for the study.

Patients were randomly selected and were divided into 2 groups as group A and group B. Group A patients performed the exercise programme under the supervision of physiotherapist (clinic) and group b patients performed the

exercise programme without the supervision of the physiotherapist (home).

Both the groups has a general session of explaining about the exercise protocol which has to be performed for the next two weeks and they instructed to apply the ice according to the area involved in the lower back for 10 to 15mts in order to reduce the spasm for the patients under the supervision of physiotherapist, the application of the ice is done by the assistant and for the patients at home, the application done by the attainer<sup>12</sup>.

Each subject were given a copy of Oswestry disability questionnaire and asked to fill it and VAS scale was recorded on day one and the exercise of the treatment protocol were taught to the patients of both the group. Which are given below:

**Protocol**

1. Pelvic tilt
2. Hamstring stretch
3. Abdominal crunches
4. Low back stretch
5. Tuck in exercise

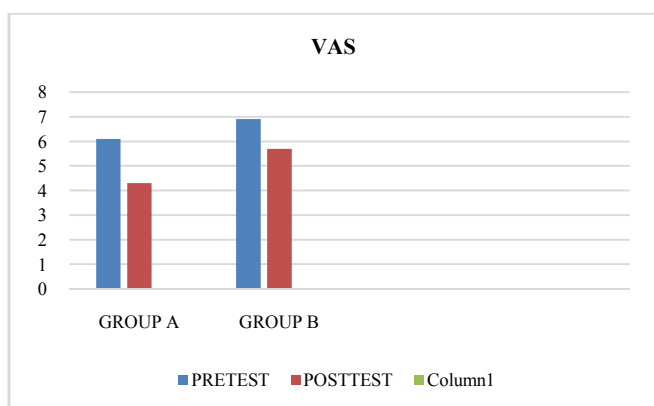
The scorers of Oswestry Disability Index Questionnaire as follows

SCORING: For each section the total possible score is 5; if the first statement is marked the section score =0, if the last statement is marked it=5. If all ten sections are completed the score is calculated as follows:

$$\text{Total score} = \frac{\text{X100}}{50(\text{total possible score})} = \%$$

These exercises were taught and asked to perform under supervision of a physiotherapist in the clinic for 2 weeks with 5 repetitions. The other Group B were also underwent the same procedure without the supervision of the physiotherapist for the same duration of the time.

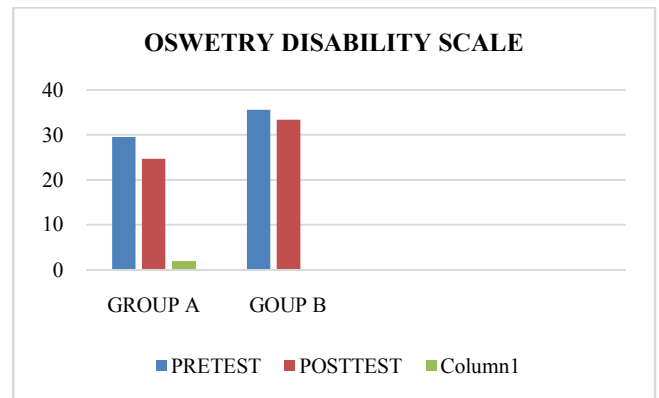
**Statistical Analysis**



**Graph 1** Comparison Between Group A And Group B In Visual Analogue Scale

Group–A: Exercise programme under the supervision of physiotherapist

Group-B: Exercise programme without the supervision of the physiotherapist



**Graph 2** Comparison between Group A And Group B In Oswestry Diability Scale

On comparing the post-test VAS score between group A and group B, it shows statistically significant reduction of Pain in group A. On comparing the post-test Oswestry score between Group A and Group B shows statistically significant reduction of pain and improvement of functional activities in Group A.

Significant - <0.05

Non – significance ->0.05

**CONCLUSION**

This study concludes that the treatment with following proper principle in the supervision of physiotherapy (Group A) is more effective than the treatment given to the patients without the supervision of physiotherapist.

**Suggestion**

- The treatment duration can be extended to 3 to 4 weeks.
- Large group of people can be taken fir study
- Second episode of mechanical low back pain can also be taken for the study
- Both the gender can be taken for the study
- Different age group can also be preferred for the study
- Different protocol of mechanical low back pain can also be used.

**Limitations**

- 2 weeks treatment duration
- Small group of people were taken for the study
- Only females were taken for the study
- Economically middle class people were selected.

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