



ASSESSMENT OF LUMBAR CORE STRENGTH IN PATIENTS WITH CHRONIC SHOULDER PAIN

Priya Virendrakumar Dubey., Mayuri Ghumatkar and Ajay Kumar

DPO'S NETT College of Physiotherapy, Thane (west)

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ABSTRACT

Objective: To assess lumbar core strength in patients with chronic shoulder pain using modified sphygmomanometre

Background: Shoulder pain is defined as chronic when it has been present for longer than 12 weeks. Shoulder pain is responsible for approximately 16 percent of all musculoskeletal complaints. Because of the impairments in the shoulder complex, there occurs abnormal dissipation of the force through the body. Core strength and stability is an essential part of biomechanical efficiency and due to the three-dimensional complex movements occurring in the joint we requires a good core strength. Dysfunction within the kinetic chain can affect how forces are transferred from the core to the upper extremity .Overuse injuries may occur due to weakness of core.

Methodology: 90 samples were taken with shoulder pain between 4-6 months. Consent form was taken. Lumbar core strength was assessed using the modified sphygmomanometer and a performance index was recorded. To assess the core strength the cuff of the apparatus was placed under the lumbar spine and inflated to 40mmhg, the patient was asked to perform drawing in so the belly button is pulled upwards such that the pressure in the cuff rises by 2mmgh. This was held for 10 seconds and if successful, repeated for 10 times. Then repeat for 4mmgh, 6mmgh, 8mmgh and 10.

Performance Index:- Record the no of times the patient can hold the level and multiply it by pressure increment. Maximum possible is 100 i.e, 10mmg X10.

Result and Conclusion: Total score was calculated and the results were interpreted. The results showed that out of the 90 subjects that were assessed, 27%, 33%, & 40% of subjects showed reduced lumbar core strength in 4 months, 5months, 6 months of shoulder pain respectively. Hence this study concluded that the lumbar core strength is affected with the extent of shoulder pain.

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INTRODUCTION

Shoulder girdle has only one bony attachment to the axial skeleton, as a result considerable amount of mobility is allowed at the shoulder joint.³

Shoulder pain is responsible for approximately 16 percent of all musculoskeletal complaints, with a yearly incidence of 15 new episodes per 1,000 patients seen in the primary care setting.⁹

Shoulder pain is defined as chronic when it has been present for longer than 12 weeks. Common conditions that can result in chronic shoulder pain include rotator cuff disorders, adhesive capsulitis, shoulder instability, and shoulder arthritis. Rotator cuff disorders include tendinopathy, partial tears, and complete tears.⁹

A clinical decision rule that is helpful in the diagnosis of rotator cuff tears includes pain with overhead activity, weakness on empty can and external rotation tests, and a positive impingement sign. Adhesive capsulitis can be associated with diabetes and thyroid disorders. Clinical presentation includes diffuse shoulder pain with restricted passive range of motion on examination. Acromioclavicular osteoarthritis presents with superior shoulder pain, acromioclavicular joint tenderness, and a painful cross-body adduction test⁹

Because of the impairments in the shoulder complex, there occurs abnormal dissipation of the force through the body¹⁰

Core:-Core is double walled cylindrical structure which is formed by,

Roof:-Diaphragm

Front:- Abdominals muscles (transverses abdominis)

Back:-Paraspinal and Glutei muscles

Floor:- Pelvic floor and hip muscles¹¹.

*Corresponding author: Priya Virendrakumar Dubey
DPO'S NETT College of Physiotherapy, Thane (west)

Core strength and stability is an essential part of biomechanical efficiency and due to the three-dimensional complex movements occurring in the joint we requires a good core strength.^{6,11}

The importance of function of core for stabilization and force generation in all the activities is recognized increasingly.

The core musculature becomes active in a feedforward manner during the upper extremity movements. This mechanism occurs when the body prepares for a potential spinal stability when movement begins.¹

Dysfunction within the kinetic chain can affect how forces are transferred from the core to the upper extremity .Overuse injuries may occur due to weakness of core.¹

There are studies which show that a relationship exists between the core (trunk and pelvis) and the upper extremity, and that optimal shoulder function during any task requires contribution from the core in a way that maximizes performance but minimizes potentially harmful forces from being applied to the shoulder complex.⁷

A paucity of literature exists to support the relationship between core stability (neuromuscular control and muscle capacity of the trunk and pelvis) and upper extremity function, injury, and performance. According to the kinetic chain model, alteration of one segment in the chain will impact successive portions of the chain.⁷

MATERIAL AND METHOD

Study Design

Type of study: observational study.

Duration of study: 1 year.

Place of study: physiotherapy OPD setup

Study Design

Sample size: 90

Sample population: - patients with chronic shoulder pain

Sampling: Convenient.

Selection Criteria

Inclusion criteria

Individuals with shoulder pain more than 4-6 months willing to participate between age group 35-45 yrs

Exclusion criteria

- Acute cardiovascular condition
- Acute respiratory problems.
- Neurological conditions
- Psychiatric illnesses
- Visual defects
- Recent trauma
- Spinal surgeries
- Shoulder surgeries

Material Used

- Pen
- Paper
- Plinth
- Modified sphygmomanometre.

Procedure

Subjects were screened as per the inclusion criteria. Prior to study a written informed consent form was taken from each subject in the language best understood by them. Patients with chronic shoulder pain were taken with convenient sampling method. Lumbar core strength was assessed using the modified sphygmomanometer and a performance index was recorded. The data was collected, analysed and results were interpreted.

Procedure to Assess Lumbar Core Strength

[3] The cuff of the apparatus was placed under the lumbar spine and inflated to 40mmhg. Ask the patient to perform drawing in so the belly button is pulled upwards such that the pressure in the cuff rises by 2mmhg.

Now ask the patient to hold it for 10 seconds and if he is successful, repeat for 10 times. Then repeat for 4mmhg, 6mmhg, 8mmhg and 10.

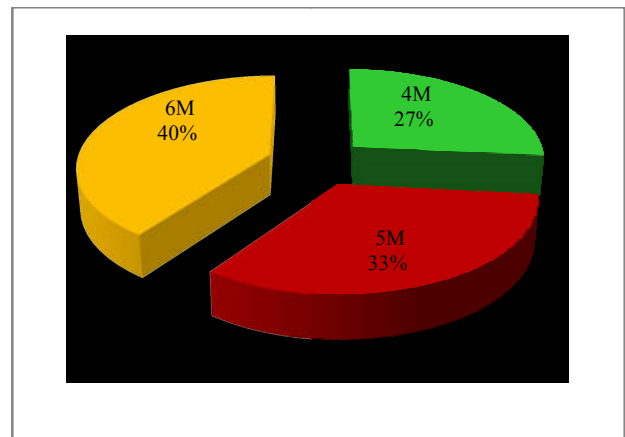
Performance Index:- Record the no of times the patient can hold the level and multiply it by pressure increment. Maximum possible is 100 i.e, 10mmg

Demographic Data

NAME	MEAN	SD
AGE	41.12	37.96
GENDER	MALE= 40	FEMALE= 50
SAMPLE SIZE= 90		

RESULTS

The results showed that out of the 90 subjects that were assessed, 27%, 33%, & 40% of subjects showed reduced lumbar core strength in 4 months, 5months, 6 months of shoulder pain respectively



Months	MEAN (performance index)	SD (performance index)	%
4	34.73	20.09	27
5	31.63	18.88	33
6	27.23	13.52	40

Inference: The above results showed that the performance index was reduced in 6<5<4 months of shoulder pain respectively

DISCUSSION

The aim of this study was to assess the lumbar core strength in patients with chronic shoulder pain of 4-6 months in between the age of 35-45 years. The sample consisted of 90 individuals with shoulder pain in between 4-6 months and lumbar core

strength was assessed using modified sphygmomanometre by placing the cuff under the lumbar spine and the subject was asked to perform drawing in the belly button and performance index was calculated for each patient.

Total score was calculated and the results were interpreted. The results showed that out of the 90 subjects that were assessed, 27%, 33%, & 40% of subjects showed reduced lumbar core strength in 4 months, 5 months, 6 months of shoulder pain respectively.

The movement at shoulder complex requires flexibility, strength, co-ordination, neuromuscular balance, and synchronicity at the shoulder. The lumbar spine requires good core strength to maintain stability during the shoulder movements.¹¹

The core musculature becomes active in a feed forward fashion during the upper extremity movement. This mechanism occurs as the body prepares for spinal stability when the movement begins. Shoulder dysfunction causes a breakdown and deficiency in lumbar core strength.¹¹

Neuro-muscular imbalances occur between synergistic and antagonistic muscles which is characterised by early dominant activation in antagonistic muscles and delay in activation of synergistic muscles. This imbalance causes instability and faulty posture that increases the pain and dysfunction. To restore the normal movement, the body adapts to compensatory mechanisms which in turn increases the imbalance and results in affection in lumbar stability and strength.¹⁰

Elliott *et al.*, 1995; Fleisig *et al.* 1996 developed kinetic chain theory that explained dysfunction within kinetic chain will affect how forces are generated, summated, or transferred from proximal segments to the upper extremity.¹⁰

Also, Burkhart *et al.*, 2003 suggested that upper extremity function requires not only isolated control of the shoulder complex, but stabilizing forces from core muscles in order to achieve optimal performance.

Thus, chronic shoulder pain may contribute to weakness of lumbar core.¹⁰

CONCLUSION

This study concluded that the lumbar core strength is affected with the extent of shoulder pain.

Limitations

1. VAS of the shoulder pain was not considered
2. Gender ratio was not maintained.

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