



THE EFFECT OF COPENHAGEN ADDUCTION EXERCISE AND RESISTANCE TRAINING ON CHRONIC GROIN INJURIES IN AMATEUR FOOTBALL PLAYERS: A COMPARATIVE STUDY

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ABSTRACT

Football is the most popular contact sport played at an international level. During football play, the various maneuvers can result in large amounts of stretching of highly activated muscles (lengthening contractions), which are associated with muscle injuries. Groin pain account for 12-16% of injuries seen. They often occur due to forceful action such as kicking, sprinting and sudden change of direction and other movements where there is high activation of muscle and/or stretched during forceful contraction. This is the most common mechanism of groin injuries in football players, The Copenhagen Adduction and Resistance Training with the help of thera-bands are known to have comprehensive effect on treating groin injuries. This study is determined to study the effects of Copenhagen adduction exercise and resistance training in amateur Indian football players with groin injuries and to find out which is more effective

KEYWORDS : football, amateur, groin pain, Copenhagen adduction exercise, resistance training,

INTRODUCTION:

Football is the most popular contact sport played at an international level, with over 240 million players. The incidence rate of outdoor injuries is highest among all sports, particularly for adult male football players.⁽¹⁾

Groin pain account for 12-16% of injuries seen. They are more common in males than in females. They often occur due to forceful action such as kicking, sprinting and sudden change of direction and other movements where there is high activation of muscle and/or stretched during forceful contraction. This is the most common mechanism of groin injuries in football players. Groin pain can be of two types: acute and chronic. Acute groin pain recover within 4 weeks. However if the initial injury is not treated appropriately after 4 weeks or if the athlete returns to sport quickly these injuries may progress to a more longstanding or chronic state. Longstanding chronic pain can be due to adductor related, iliopsoas related, abdominal wall related or due to pubic bone stress. Of these, adductor related groin injuries account for 70% of chronic groin injuries.⁽¹⁾

Traditional treatment for most types of groin pain was 'rest' but this most often resulted in a return of symptoms or resumption of activity. These involve static and dynamic exercises aimed at improving the muscles stabilizing the pelvis and the hip joints, especially the adductor muscles.⁽²⁾

Strengthening protocols often help to decrease the number of injuries. Scientists from several universities in Copenhagen cooperated with Sports Groin Pain Centre-Aspetar Clinic in Qatar- to check the impact of an 8 week training program on the strength and resistance of thigh adductor muscles. The aforesaid program required doing one simple exercise called Copenhagen Adduction. This exercise was chosen due to its simplicity and easy implementation in conditions because it can be done on the pitch without any tools. The only help is required from a partner, partners may take turns.⁽⁴⁾

The use of elastic resistance products in therapeutic exercise programs has become widespread in rehabilitation and has been shown to be an effective method of providing sufficient resistance to improve muscle strength. Resistance training with elastic product also has been shown to be a feasible alternative to training with weight machines and free weights, generating comparably high levels of muscle activation during exercises. Elastic resistance products, specifically designed for use during exercise, fall into two broad categories-elastic bands and elastic tubing. Elastic bands and tubing are produced by several manufacturers under different product names, the most familiar of which is Thera-Band Elastic Resistance Band and Tubing. Elastic bands are available in an assortment of grades or thickness. Color coding denotes the

thickness of product and grades of resistance. So, depending upon the colour coding different thera-band can be used in the resistance training program.⁽³⁾⁽⁵⁾

NEED OF STUDY

There have been studies conducted separately on Copenhagen Adduction exercises and resistance training for groin pain but no studies have been conducted comparing the effectiveness between the two in amateur football players of the Indian population.

Hence, the need of my study is to find out which of the two techniques is more effective for groin injury.

AIMS AND OBJECTIVES

To compare the effect of Copenhagen adduction exercises and resistance training on chronic groin injuries in Indian amateur football players, with the help of Hip and Groin Outcome Score (HAGOS).

Objectives

1. To find the effect of Copenhagen Adduction exercises on chronic groin injury in amateur football players on the Copenhagen Hip and Groin Outcome Score Scale (HAGOS).
2. To find the effect of resistance training on chronic groin pain in amateur football players on the Copenhagen Hip and Groin Outcome Score Scale (HAGOS).
3. To compare the effect of Copenhagen Adduction exercises and resistance training on chronic groin injury in amateur football players on the Copenhagen Hip and Groin Outcome Score Scale (HAGOS).

METHODOLOGY

- Study design - Experimental study
- Sample size - 60 subjects
- Sampling design - Purposive sampling
- Study population - Amateur football players (Age 15-25)
- Study setting - Football clubs and college teams in and around Pune
- Duration of study - 6 months
- Intervention period - 8 weeks

INCLUSION CRITERIA

1. Age-15 yrs to 25 years
2. Gender- Male
3. Patients who have had longstanding groin pain since 3 months.
4. Patients who have played football for 1 year or less

EXCLUSION CRITERIA

1. Patients who have groin pain due to other hip and abdominal pathologies
2. Recent fractures of the femur
3. Congenital deformities of the hip

MATERIALS

1. Pen
2. Paper
3. Resistance Band (Thera-Band)
4. Informed Consent form
5. Evaluation Proforma

OUTCOME MEASURES

1)The Hip and Groin Outcome Score Scale

PROCEDURE

The subjects will be selected according to the exclusion and inclusion criteria and accordingly the samples will be formed and their consent will be taken. In the study, random sampling method will be used.

Prior to the intervention, adductor squeeze test will be performed and outcome measures, i.e., HAGOS will be taken. Weekly assessments will be done, and, at the end of the intervention, subjects will be re-assessed to check progress.

Group A will be receiving Copenhagen Adduction exercise for 8 weeks, 5 days a week.

Group B will be receiving resistance training for hip adductors with theraband for 8 weeks, 5 days a week.

COPENHAGEN ADDUCTION EXERCISE

- Frequency-5 days/week
- Duration-8 weeks
- Sets-2 and then slowly progressed to 3

Repetitions-Starting with 6 ending up with 15 each per side

A person who does exercise lies on the forearm on his side and supports himself, while his partner supports his upper leg from the back by grabbing the the area of the ankle and with another hand-under the knee. The person who does the exercise tries to keep the torso horizontally and position legs to form a V shape. At this time, he adducts a lower leg to the upper leg (supported by the partner) for 3 seconds, and then descends the leg in eccentric movement for 3 seconds until touching the floor. Partners who wish to make pairs must be similar in terms of heights and body weight.

RESISTANCE TRAINING

- Frequency-5 days/weeks
- Duration-8 weeks
- Sets-2
- Repetitions-10, then slowly progress to 20

The standing hip adduction exercise uses a resistance band to work your adductors from a standing position. One set of adductors works while you stand on the other leg. Stand up with your right side next to a sturdy object. Loop a band around your right ankle and the object and tie off the ends of the band. Relax your arms at your sides. Then, pull your right leg away from the object and cross it in front of your left shin. Return your right leg to the start position.

DATA AND STATISTICAL ANALYSIS

Statistical analysis was conducted using INSTATTM for Windows.

Inter group analysis (Grp A – Copenhagen Adduction Exercises & Grp B – Resistance Training) was done with unpaired t test, while the intra group analysis was done using the paired t test

DEMOGRAPHIC DATA

All the subjects that participated in this study were male (N=60).

The overall mean age is 22±2.322 yearsThe mean age for Group A is 22.30 yrs, while the same for Group B is 22.23 yrs.

Table 1 and Graph 1: : Comparison of pre & post combined Scores for Group A on HAGOS scale

	PRE	POST	
MEAN ± SD	240.69±28.965	498.47±13.60	
P - VALUE	<0.0001		Extremely Significant
T - VALUE	48.54		

Graph 1

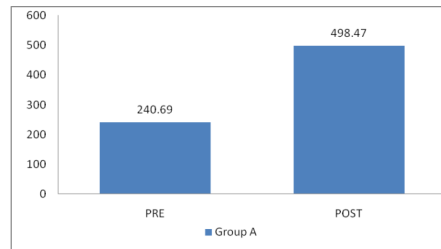
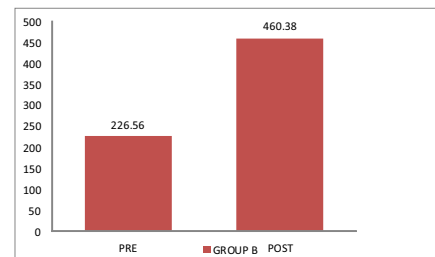


Table 2 and Graph 2 Comparison of pre & post combined Scores for Group B on HAGOS scale

	PRE	POST	
MEAN ± SD	226.56±18.174	460.38±12.99	
P - VALUE	<0.0001		Extremely Significant
T - VALUE	55.80		

Graph 2



RESULT

COMPARISON OF PRE AND POST SCORES OF GROUP A AND GROUP B ON HAGOS SCALE.

Table 1&2: Comparison of difference in pre and post HAGOS scale scores, t value and p value.

60 subjects were selected based on the inclusion and exclusion criterias and then they were divided in 2 groups Group A and Group B. Both the groups were explained about the Copenhagen adduction exercise and resistance training respectively. The exercises were performed under supervision for 5 days in a week for 8 weeks. The values of HAGOS scale were recorded before and after commencing both the protocols. The pre and post analysis using paired t test revealed a statistically significant (p< 0.0001) difference among the group between pre test and post test scores. The mean values obtained by the pre and post treatment (48.54 pre and 55.80 post which is more than the pre treatment score) shows a significant difference. Thus indicating improvement post treatment.

DISCUSSION

This study was done to see the effectiveness of Copenhagen adduction exercise and resistance strengthening on chronic groin pain in amateur football players. The results show that the Copenhagen exercise were more effective in reducing groin pain in amateur football players than resistance training.

According to Ishøi and Serner, the CA exercise in football players had an activation level of 108% after a 8 week program, the CA exercise also increases the Eccentric Hip Adduction (EHAD) strength by 35.7%. This increase in strength of the adductor muscles in turn decreases the intensity and helps in prevention of groin injury in the player. [4] [15]

Danish researchers investigated the effectiveness of Thera-Band hip exercises in football players. According to Jensen et al, there was a 30% increase in Eccentric Hip Adduction (EHAD) strength after 8 weeks of strength training with one drawback, DOMS was reported throughout the intervention period in their results. Their study showed that 8 weeks of hip-adduction strength training, performed with elastic bands as external load, increased maximal eccentric hip-adduction strength substantially while reducing the incidence of groin injuries in sub-elite football players. [5] [8] [15] The similar results were noted in our study, in the group undergoing thera-band resistance exercises.

Players with weak core stability are also at an increased risk of suffering from groin strain, if the "core" is weak its influence can be seen on the lower extremity mechanics and its performance. The lumbar, pelvis, and hip region together are considered to be the core of the body and are collectively called the lumbopelvic-hip complex (LPHC). In football this "core" is responsible for preventing stretch or tear of adductor muscles as well as abdominal muscles. [11] [12] [13] [14]

Hence, the reason why CA exercises are more effective than resistance exercises is because they are done in a side plank position which directly involves the core muscles. This gradually increases the core stability and strength which is inversely related to groin strains, thus decreasing the intensity of groin pain along with increasing the eccentric hip adductor strength.

Hence, the study concludes that Copenhagen adduction exercises are more effective than resistance training in amateur football players.

CONCLUSION

Copenhagen Adduction Exercise along with conventional therapy appeared to be more effective than resistance training to decrease pain and decrease the incidence of groin injuries in amateur football players.

SUMMARY

The objective of the study was to study the effect of Copenhagen adduction exercise and Resistance training on groin pain in amateur Indian football players of age 15-25 years. The primary data was collected from various football clubs and college teams in and around Pune. The participants for this comparative study were selected on basis of inclusion and exclusion criteria. A total of 60 subjects having groin pain for more than 3 months were a part of this study. The subjects were randomly allocated in to 2 groups of 30 participants each. Group A received Copenhagen adduction exercise and Group B received Resistance Training. Baseline assessment of groin pain was obtained using The Hip and Groin Outcome Score (HAGOS) scale. On statistical analysis, it was noted that Copenhagen adduction exercise is more effective than resistance training and showed better improvement in terms of pain and reducing incidence on groin pain.

LIMITATIONS

Sample Size was small.

Categorization with respect to severity of groin injury was not considered.

FUTURE SCOPE

Study can be done on different types of sport players, like hockey, cricket, etc.

Immediate effect of Copenhagen adduction exercises on field can also be checked.

Study can also be done to compare the genders on the basis of physiological variation.

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