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Research article

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A study to assess the sensory adaptation after A 2 – week stretching regimen of rectus femoris muscle in recreational football players

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ABSTRACT

Football is a challenging, demanding and high performance sports. The Football game is played from the school level, college level to professional level. The main aspect of stretching is the sensory adaption which can be achieved only when the muscle is stretched for atleast 2 – weeks. The cause for sensory adaption is the sensitization of mechanoreceptors. The stretching of rectus femoris muscle by the method of evjenth and hamberg is widely used, which is the advanced for sensory adaption to take place. In the study, the investigator used EVJENTH and Hamberg Stretching procedure in football player to know the amount of sensory Adaptation taking place in the muscle after a 2 week stretching regimen. Stretching Regimen applied to rectus femoris muscle by Evjenth and Hamburg method is the most significant and advanced method to make the Muscle to be sensory adapted. The period of 2 week is an optimal duration in which the sensory Adaptation takes place. The football players have an advantage to exhibit their skill more easily by the enhanced effect of sensory adaptation. Employing this method in their collegiate and advanced level the players Can lead to increase performance..

Keywords: Evjenth and Hamburg Stretching, Sensory adaptation, Borg Category Scale Ratio.

INTRODUCTION

Football is a challenging, demanding and high performance sports. The Football game is played from the school level, college level to professional level. It is also played as recreational sport in our day to day life.

In the game itself the players need to perform activities which are required with maximum effort and high performance. The players need to Understand their role, their warm-up schedule and also effect of injuries that Can cause to them.

Stretching is a main warm-up procedure which is used for flexibility training, reduce tenderness, prevent injuries and also improve his skills. (gleam GW 1997)

The main aspect of stretching is the sensory adaption which can be achieved only when the muscle is stretched for atleast 2 – weeks. The cause for sensory adaption is the sensitization of mechanoreceptors.

The stretching of rectus femoris muscle by the method of evjenth and hamberg is widely used, which is the advanced for sensory adaption to take place.

In the study, the investigator used EVJENTH and HAMBERG Stretching procedure in football player to know the amount of sensory Adaptation taking place in the muscle after a 2 week stretching regimen.

Statement of the Problem

This study is to know effect of sensory adaption after a 2 – week Stretching regimen of rectus femories muscle.

Significance of the study

Muscle stretching exercises are commonly applied as flexibility training In sports activities. The football player stretching is recommended as a self administered Way to prevent (or) alleviate discomfort caused by different movements.

The mechanism behind stretching is reduction of passive stiffness of the Muscle tendon unit, this was showed in the research by madding et al end Toft et al. The rectus femoris muscle itself is more susceptible to tightness and Is often subjected to stretch exercises for sports activities, in particular Football.

Objectives

- i. To elucidate the mechanism of the effevts of muscle stretching.
- ii. To present data for sensory adaptation after 2 – weeks.

Operational definitions

Stretching Regimen for Rectus femoris muscle by evjnth and Hamberg For (2 weeks) was by

- 1) A 3 minute warm up jogging
- 2) 10 squats
- 3) Stretching the rectus femotis muscle according to evjenth and Hamberg.
 - a) 20 seconds of stretching
 - b) 2 to 3 second of relaxation
 - c) Again 20 second of stretching without returning to standing.

Limitation of the study

1. Study was limited to male recreational football players @ college level
2. The study period was limited to 2 weeks.

REVIEW OF LITERATURE

Roberts KM, Ekstrasd J (1994)

Sports like football require fitness, skill, performance at maximum to Make the player to perform up to the demands of the game.

Recse RC (1995)

Rectus femories muscle is important for sports activities like football as It is more prone to injuries.

Noris CM (1995)

Rectus femories musclue, which is a two joint muscle is susceptible to Tightness.

Lenart G (1974)

Shotening of rectus famous muscle in most cases, apparently Congenital, lead to changes in gait pattern and restriction of knee range of Motion.

Hamberg J. Bjorklund M (1993)

The rectus femories muscle and its, Connective tissues tighten up earlier In the position performed by Hamberg J and Bjorkl and, which gives maximum Stretch at the end point of motion, also for those who are not so stiff.

Gleim GW (1997)

Stretching is most commonly used for flexibility training is most sports Like football.

MC Claflin RR (1994)

Stretching reduces tenderness, tension and enhances rom.

Halbertsma JP (1994)

The stretch was belived to yield on adaptive (or) a sensory effect rather Than decrease in passive tension.

Magnusson SP (1996)

Nocieptive nerve endings in joint an muscle are possible, Structures For increase in stretch tolerance. The tissue properties remained unchanged Where as the stretch tolerance was evident after a 2 week Stretching regimen.

Proske U (1993)

Mechanoreceptor and proprioceptor shower reduced firing after single Stretch maneuvers.

Hong C-Z (1996)

Any structure in skeletal muscle can be potentially sensitized, may evolve to a trigger point. This trigger point in the muscle is a common pathway of Pathogenesis of muscle pain from different causes.

Jaeger B (1986)

Myofascial trigger point sensitivity decreases in response to passive Stretching.

Mense.S (1993)

Mechanics of sensory adaptation after stretch is by high threshold Mechanoreceptor which are being sensitized.

Borg G (1982)

Grading the stretch sensation by category scale from the anterior aspect Of thigh is an subjective grading.

METHODOLOGY

Research Design

An experimental study design was chosen to determine the effects of Sensory adaptation after a 2 week stretching regimen of Rectus femoris muscle In recreational football players.

Tools for Data Collection

A Questionnaire to obtain information on the stretching, ROM reading Are attached in the Appendix – A.

Table	Category Scale According to Borg
0	Nothing at all
0.5	Extremely weak (Just noticeable)
1	Very Weak
2	Weak (light)
3	Moderate
4	Somewhat Strong
5	Strong (Heavy)

Program Schedule

The therapist placed the goniometer and measured the knee ROM while

The subject was placed in prone lying with one leg on the ground and the other Leg being flexed. This method is according to Evjenth and Hamburg.

Setting

This study was conducted with football players, who were students in Saveetha Dental College and General Hospitals Chennai. There reading were Taken in a private setup room.

Sampling

The sampling technique used was random sampling. Totally 40 subjects Were selected for this entire study and were assessed before stretching and After stretching.

Inclusion Criteria

Male football players of 40 in number were taken. They should have Taken part atleast in the inter college level competitions. They should not have any injuries in hip, thigh and knee. The players should not have undergone any surgeries.

Data Collection Procedure

The investigators personally met the subjects and explained the Program, objectives and significance of the study. Prior consent of all subjects were taken after explaining them the Objectives and the program of the study.

Evaluation of subjects were done based on the questionnaire attached In the Appendix – A.

A warm up was mandatory before all the parameters were evaluated.

The subject was asked to say when stretch sensation in anterior Aspect of thigh was strong (at 5 on the category scale). This procedure is Repeated 3 time with the same leg for an average.

The experimental treatment consists of

1. 3 minute warm-up jogging
2. 10 squats

3. Stretching of rectus femoris muscle by Evjenth and Hamburg
 - 20 seconds of stretching.
 - 2 to 3 seconds of relaxation
 - Again 20 seconds of stretching without returning to standing position.

To assess all the parameters (such as RT ROM before and after Stretching, It ROM before and after stretching) mean, SD were used.

Correlation coefficient was used to find out the relation between pre- Stretching and after stretching regimen.

To find out the significant changes before and after stretching paired ‘t’ Text was used.

To compare changes in Borg scale values, Student ‘t’ test value was used.

Statistical Method

The collection data were tabulated and analysed using pre-test and post Test statistics.

Table 1: Mean, standard deviation, correlation and P value of right ROM

	ROM Before S.Rt		ROM After S.Rt		r	t-test	P-Value
	Mean	S.D.	Mean	S.D.			
Rt	136.12	1.99	136.20	1.99	0.991	1.777	P > 0.05 N.S.

Table 1 shows that the mean and SD are initially (136.12, 1.99). this is Same when compared after 2 weeks programme. (136.20, 1.99)

This table implies that there is no significant changes after end of 2 Weeks. P < 0.05.

Table 2: Mean, standard deviation, correlation and P value of left ROM

	ROM Before S.Rt		ROM After S.Rt		r	t-test	P-Value
	Mean	S.D.	Mean	S.D.			
Rt	136.07	1.97	136.15	1.96	0.984	1.355	P > 0.05

Table 2 : shows that the mean and SD are initially (136.07, 1.97). this is Same when compared after 2 weeks programme. (136.15, 1.96)

This table implies that there is no significant changes after end of 2 Weeks. P < 0.05.

Table 3: Mean, standard deviation, P value of Borg’s Category Scale Readings Before and After Stretching

	ROM Before S.Rt		ROM After S.Rt		t-test	P-Value
	Mean	S.D.	Mean	S.D.		
Borg	5.00	0.0	2.27	0.45	38.993	P > 0.001 S.S.

Table 3 shows the mean, P value. There is a change when compared after 2 weeks of stretching Regimen (22.27 – 0.45)

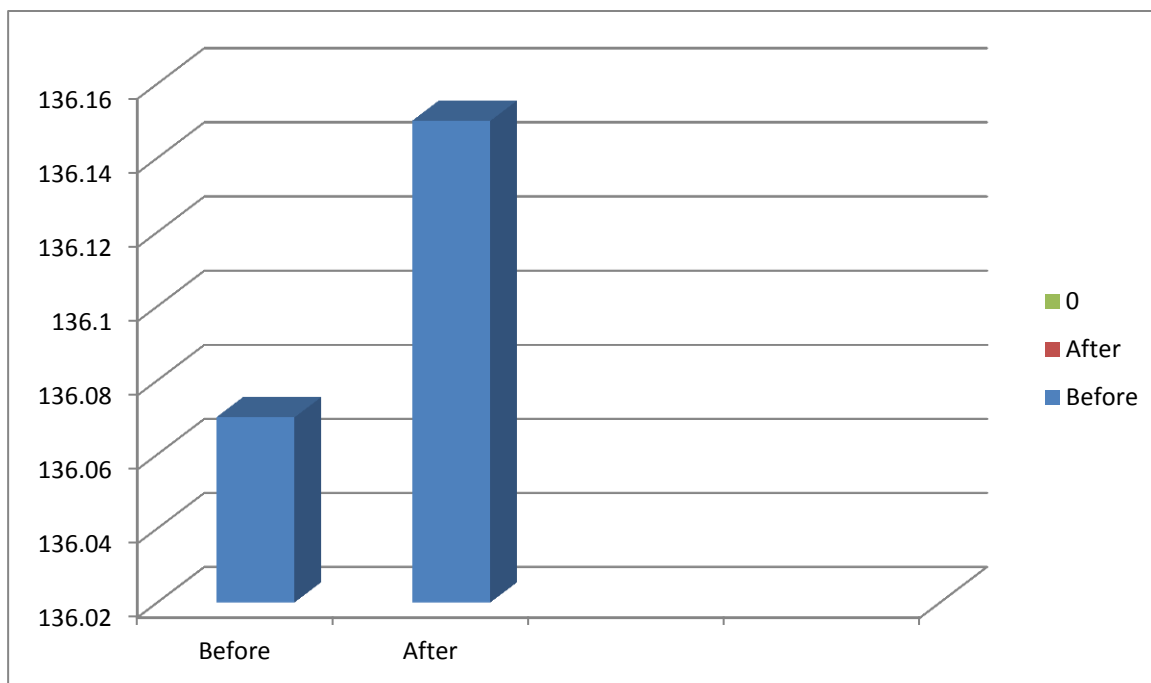


Figure: This table implies that there is significant changes and marked Improvement in the stretch adaptation at the end of 2 Weeks. P < 0.001.

DISCUSSION AND CONCLUSION

Discussion

In this study showed a decreased stretch sensation to stretching for Rectus femoris after a 2 week stretching Regimen.

The mechanic explanation for this sensory adaptation (ie. The receptors Were believed to be nociceptive nerve endings in joint and muscle) according To Magnusson.

Other proposed, mechanoreceptor and proprioceptor that showed Reduced firing after single stretch maneuvers.

No increasing in range of motion was found in this study (P<0.05) for right and (p<0.05) for left.

This can be interpreted to mean that passive stiffness of the muscle was Unaffected by the stretch regimen (Evjenth and Hamberg). Changes in muscle Stiffness would have occurred if a more intense protocol was used.

The subjective grading of stretch sensation in borg scale before Stretching and after stretching showed a significance of P<0.001.

Conclusion

From this study, it is concluded that : Stretching Regimen applied to rectus femoris muscle by Evjenth and Hamburg method is the most significant and advanced method to make the Muscle to be sensory adapted.

The period of 2 week is an optimal duration in which the sensory Adaptation takes place.

The football players have an advantage to exhibit their skill more easily By the enhanced effect of sensory adaptation.

Employing this method in their collegiate and advanced level the players Can lead to increase performance.

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