ORIGINAL ARTICLE

EFFECTS OF HOLMICH PROTOCOL AND MYOFASCIAL RELEASE TECHNIQUE ON GROIN PAIN IN TENNIS PLAYERS

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ABSTRACT

Introduction: Tennis with a normal 17.9 million players is one of the most renowned games with a colossal addition in young tennis players as of late. The prevalence of groin injury increases rapidly in tennis players due to demand of rapid change in direction.

Material & Methods: Once ethical approval was taken from Institutional review Board (REC/Letter-00722), a Randomized Clinical Trial (RCT) was conducted on 22 players through nonprobability purposive sampling in Pakistan Tennis Federation, Islamabad. Players were randomly divided into two groups by sealed and envelop method. Group A received Holmich protocol while group B received myofascial release technique. Other than demographics, functional tests like hip range of motion, visual analogue scale, t-test, Edgren sidestep test and triple hop test were conducted to assess the techniques given to groups. Data was analysed using SPSS 21. Trial is registered in US clinical trial registry (NCT04642300).

Results: The results of the study show that there was no significant difference between Myofascial release technique and holmich protocol in athletes with groin pain (P value>0.05). Mean age of the tennis players was 23.14±4.5 in years. Pre and post comparison of both interventions shows significant effect in Range of motion, Pain, Agility and hop test. (P value<0.01).

Conclusion: From the results it can be seen that there was no significance between the two techniques. So in conclusion both techniques can be used to treat groin pain and get successful results.

Key Words: Groin Pain, Holmich Protocol, Myofascial release technique.

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INTRODUCTION

An injury or tear to any of the adductor muscles of the thigh is known as a groin strain. These muscles are located on the inner thigh. Sudden movements such as kicking, twisting, or jumping generally put acute strain on the groin.[1] The prevalence of groin pain increase very rapidly up to 3 times higher in elite male players.[2] The muscular weakness of adductors of thigh or abductor/ adductor strength ration deficiency increase the risk of groin strain in athletes.[3]

In human anatomy, the groin, also known as the inguinal region, is present between the abdomen and the thigh on either side of the pubic bone.[4] The adductor muscles of the hip or the muscles of the groin are known as the medial compartment of the thigh. A combination of abdominal muscle injury with groin injury leads to long recovery time.[5] A painful injury sustained by straining the hip adductor muscles is commonly known as a torn groin muscle.[6] Tennis plyers of all ages and skill levels experience lower extremity problems more often. In fact, up to 67% of all tennis players face lower limb problems.[7] Groin strain is one of the most common injuries faced by elite youth tennis playerss.[8,9] Although there is no conclusive comparative research with friction and connective tissue massage, there have surely been many cases of patients treated by therapists with positive results.[10]

Exercise plays key role in rehabilitation of groin pain in athletes having groin or adductor strain.[11]. Athletes who involve in active exercise with combination of passive intervention such as manual therapy techniques reduces the time of injury and return to sports occur with ease.[12] A new intervention was introduced by Holmich et al in 1999 provides the best evidence of the effectiveness of exercise as a prescription for the treatment of groin pain associated with adductor muscles.[13,14] A recent study conducted to check the effect of modified Holmich protocol in patients with long standing adductor groin pain and concluded that modified Holmich protocol is comparatively more effective and safer for the athletes.[15]

There is very limited literature available to determine the effect of Holmich protocol in different sports. The purpose of the study was to compare the effects of the Holmich protocol and the myofascial release technique on groin pain among tennis players. Most national or international studies are conducted on football players or unspecified athletes, although this is one of the problems faced by tennis players.

MATERIAL AND METHODS

The Randomized Clinical Trial was conducted at the Pakistan Tennis Federation in Islamabad from February 2020 to September 2020. Ethical permission was taken from the Institutional Review Board (IRB) of Riphah International University Islamabad. (REC/Letter-00722). Permission was taken from the administration of Pakistan Tennis Federation and consent was taken from every athlete before inclusion into the study. Twenty-two athletes were included in the study who met the inclusion criteria and athletes were randomly divided into two groups by sealed and envelop methods.

The sampling technique used in the study was non-purposive probability sample. Male long tennis players from age of 18 to 35 years with more than a year of playing experience were recruited in study. Those players who had mild to moderate level of pain (1-7) on the Numeric Pain Rating Scale (NPRS) and pain lasting for at least 2 months were selected.

When performing a physical examination, it was important to assess whether back pain was due to adductor muscle tone. If the player having femur or inguinal hernia, illio-inguinal nerve, chronic urinary tract disorders or prostatitis, disease, pelvic fracture or lower extremities from completing a treatment plan, or pain felt between T10 and L5 levels and excluded from the study. During the study, players were not allowed to use non-steroidal anti-inflammatory drugs, and if any of the players fail to continue active physical training, they were removed.

The Holmich protocol was administered to group A. Treatment was given three times a week (on equal or odd days). Duration of the session was 90 minutes for Module 1 (first two weeks) and 120 minutes for Module 2 (third week). From the third week onwards, athletes performed exercises from Module 1 daily between treatment sessions. Group B players received a myofascial release technique, with the treatment being performed twice a week by a physiotherapist. Treatment time is about 30 minutes.

No physical activity was permitted during treatment and before final evaluation. Participants were allowed to ride a bicycle on the condition of being painless. From the sixth week of treatment, participants were allowed to walk slowly, without causing pain in the groin area. Hip range of motion, T-test, Edgren's sidestep test, Numeric Pain Rating Scale (NPRS) and triple-hop test data were calculated at baseline and post-intervention to enable us to perform treatment protocol analysis. The trial is registered in US clinical Trail Registry (NCT04642300). Data was entered in SPSS version 23. Test of normality (Shaprio Wilk Test) was run to check normal distribution of data. Data was normally distributed that fulfil the assumptions of parametric test so independent T- test was used to compare pre and post assessment of both groups. Demographic data were presented in the form of frequency and percentages and descriptive statistics was presented in the form of Mean and Standard Deviation.

RESULTS

Total 22 male athletes were selected who fulfilled the inclusion criteria. Out of which 11 (50%) were grouped in group A and 11 (50%) were in group B. The mean age calculated was 23.14±4.5 years with mean of height and weight was 173±63cm and 69.55±7.2 kg respectively.

The independent T test was used to compare results of both interventions that show no significant difference in both interventions. There was no statistically significant difference in range of motion after application of both interventions. The pain reduced in both groups and no significant difference observed in both groups (P value=0.347). Agility was also improved in both groups which was checked by T-agility test and no significant difference observed in both groups (p value=0.565). There was no significant difference in triple hop test (p value=0.410) and Edgren Sidestep Test (p value=0.406) (Table-1).

Pre and post comparison of myofascial release technique and Holmich Protocol shows significant effect in abduction, adduction, internal rotation, external rotation, Numeric Pain Rating Scale (NPRS), T-agility test, Edgren sidestep test and Triple hop test with p value<0.01 (table-2).

DISCUSSION

The purpose of this study was to develop and evaluate a modified treatment protocol based on muscular facial release and exercise therapy for the treatment of inguinal pain. As far as we know, an 8-week training protocol that benefits from releasing muscular facial muscles and strengthening hip adductor, abductor, pelvic and core stabilization is pain, hip adductor and return to abductor strength, hip ROM, functional ability and sports.

It should be mentioned that the inclusion and exclusion criteria for current studies were similar to those for the study by Holmich et al. A difference was found between the two studies. In the current study, similar ages were observed in both groups.[16] Compared to the Holmich protocol, the average age (age = 23.14) is slightly younger than the age of athletes who participated in the study by Holmich et al. (Age) Participation = 30).[16] When comparing pain based on VAS, participants had pain of 4-6, but the selection criteria for the Holmich study did not include a pain threshold. There were also some differences in the concept of basic properties between the two studies. In a shorter period of time compared to the study by Weir et al, the recovery rate is high. In the next study, the intervention group had a 55% prognosis, with an average of 17.3 weeks to return to full exercise.[17]

According to VAS, the reduction in pain significantly changed the results of the present study. The Holmich exercise protocol group showed significant improvement (from 4.45 to 0.55) and the myofascial release group (from 5.36 to 0.91) and achieved in a short period of 8 weeks. The following results were better than the results obtained

by Weir et al. In the study, the experimental group significantly reduced discomfort in 16 weeks with Weir et al.[17]

The ROM hip joint was significantly improved (myofascial release) at the end of the intervention the results were similar to those of Goran Markovic. They enrolled soccer players as participants in their study and used fascial abrasion (FAT) and foam lamination (FA) techniques, suggesting that FAT and FR led to improved ROM of the hip in soccer players. The result of the study of the currents agreed with these suggestions as all primary ROM variables improved significantly in our study. In addition, most of the side effects were not seen.[18]

Significant changes in the range of motion of the hip joint (abduction, extension, internal rotation, and external rotation) were observed. Abduction and internal circulation were significantly improved from the baseline ($p = 0.01$). As the range of internal rotation of the hip decreases, it may be the primary risk factor for groin injuries.[5] The outcome of the Holmich protocol as an intervention may provide benefits for the treatment of groin pain or related injuries and the prevention of related injuries.[5]

Several intervention studies and systematic reviews have shown that myofascial self-release increases range of motion. Also, our main results indicated that myofascial release increases the range of motion of the hip (ie abduction / adduction and internal / external rotation).[19, 20] A similar efficient performance effect, like ours, was previously observed on myofascial release from the hamstrings, as measured by muscle electrical activity.[21]

The present study indicates a significant improvement in t-test agility. The results of functional tests were significantly improved at week 8 of the intervention program (Holmich protocol) compared to the initial value ($p = 0.01$). The Holmich exercise protocol significantly improved the function variables of the present study, the triple hop test and the Edgren sidestep test. The study was conducted by Abbas Yousafzadeh and colleagues in 2018 on chronic addiction-related groin pain in athletes. Her treatment group experienced a modified Holmich protocol as intervention. The following study showed that test group performance tests were significantly improved and returned to physical activity. [15]

A randomized controlled trial was conducted in 2017 on the prevalence of groin problems in athletes, based on exercise Copenhagen adduction, with the aim of evaluating the effect of an exercise approach by Jor Haroy et al. Men's football. The results of the study below showed that the risk of groin problems and increased muscle activity in the intestinal group was 41% lower, confirming the result of our study. The Holmich program has significantly reduced groin problems and improved range of motion.[22]

CONCLUSION

It may be concluded that there is no significant difference between the treatment protocol of Holmich Protocol and myofascial release technique. However, both of these treatment protocols are beneficial for the treatment of groin pain in tennis players.

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Table-1 Pre and post comparison of group A and B with Mean and Standard Deviation

Variables		Group A Mean±SD	Group B Mean±SD	P value
Abduction	PRE	24.55±5.88	22.00±9.09	0.447
	POST	40.91±4.03	40.82±5.68	0.966
Adduction	PRE	14.00±5.47	12.00±5.29	0.394
	POST	24.45±4.20	24.18±2.63	0.858
Internal Rotation	PRE	23.09±6.80	21.27±4.42	0.468
	POST	35.73±3.37	36.36±5.57	0.750
External Rotation	PRE	26.82±8.42	24.36±8.92	0.515
	POST	51.36±9.12	50.18±7.09	0.738
Numeric Pain Rating Scale	PRE	4.45±1.50	5.36±1.74	0.207
	POST	0.55±0.82	0.91±0.94	0.347
T Agility Test	PRE	11.41±0.73	11.93±1.05	0.197
	POST	9.75±0.53	9.89±0.55	0.565
Edgren Sidestep Test	PRE	36.36±6.37	37.82±4.33	0.539
	POST	54.09±10.27	51.00±6.26	0.406
Triple Hop Test	PRE	9.55±3.32	7.36±3.04	0.124
	POST	19.64±2.76	18.27±4.58	0.410

Table-2 Within group analysis of both group A and B

Variable	Intervention	Group A Mean±SD	P-Value	Group B Mean±SD	P-Value
Abduction	Pre	24.55±5.88	0.001	22.00±9.09	0.001
	Post	40.91±4.03		40.82±5.68	
Adduction	Pre	14.00±5.47	0.001	12.00±5.29	0.001
	Post	24.45±4.20		24.18±2.63	
Internal Rotation	Pre	23.09±6.80	0.001	21.27±4.42	0.001
	Post	35.73±3.37		36.36±5.57	
External Rotation	Pre	26.82±8.42	0.001	24.36±8.92	0.001
	Post	51.36±9.12		50.18±7.09	
NPRS	Pre	4.45±1.50	0.001	5.36±1.74	0.001
	Post	0.55±0.82		0.91±0.94	
T-agility Test	Pre	11.40±0.73	0.001	11.92±1.05	0.001
	Post	9.75±0.53		9.89±0.55	
Edgren Sidestep Test	Pre	36.36±6.37	0.001	37.82±4.33	0.001
	Post	54.09±10.27		51.00±6.26	
Triple Hop Test	Pre	9.55±3.32	0.001	7.36±3.04	0.001
	Post	19.64±2.76		18.27±4.58	