

The Effectiveness of Posterior Femoral Glide Technique for Iliopsoas Pain and Tightness in Contemporary Dancers

Mathiyarasi. R¹, T. Bharaneedharan², K. Karunakaran³, Sayeeswari.S⁴

¹Assistant Professor, Sri Venkateshwaraa College of Physiotherapy, Puducherry, India

²Professor, Sri Venkateshwaraa College of Physiotherapy, Puducherry, India

³Associate Professor, Sri Venkateshwaraa College of Physiotherapy, Puducherry, India

⁴Intern, Sri Venkateshwaraa College of Physiotherapy, Puducherry, India

Abstract: Background: Contemporary dance is a style of expressive dance that combine element of several dance including Modern, Jazz, Lyrical and Classical Ballet. Dancers are most commonly affected with iliopsoas tightness due to repetitive flexion of hip. Objective: To find out the effectiveness of posterior femoral glide technique for iliopsoas pain and tightness in contemporary dancers. Methods: Pilot study was conducted on 15 contemporary dancers were selected under the selection criteria aged between 18-25 years with pain and iliopsoas tightness and 15 dancers were given with posterior femoral glide technique. The outcome tools used are numerical pain rating scale (NPRS), Thomas test(hip flexor angle) both are measured before and after the treatment. Results: The obtained data were analyzed by using 't' test and paired 't' test. Comparison of post difference of numerical pain rating scale and range of motion score between experimental and control group. The 'p' value is 0.001. Hence, it is concluded that, NPRS and ROM has high significance. Conclusion: This study concluded that posterior femoral glide technique has got beneficial effect in improving the hip flexion range in contemporary dancers with iliopsoas tightness.

Keywords: Hip Flexor Angle, Numerical Pain Rating Scale, Posterior Femoral Glide Technique

1. Introduction

WHO defined as dance injury, "a physical condition that causes pain (or) discomfort resulting in a limitation, restriction (or) cessation in participation in dance?"^(1,2) Musculoskeletal injury is the most frequently reported medical problem among classical & modern dancers. Dance injury, 80% occurs in lower limb & 20% occur in spine.⁽³⁾

At 20th century, Merce Cunningham is the first one to develop an contemporary and establish it. This started during 1878's to 1927's.⁽⁴⁾ Contemporary dance is a style of expressive dance that combine element of several dance including modern, jazz, lyrical & classical ballet.⁽⁵⁾ The main repetitive feature of contemporary dance is the use of parallel in the legs, flexion, twisting and tilting the spine.⁽⁶⁾

The prevalence of contemporary dance injury was 77.39%.⁽⁷⁾ the incidence in female dance was 9.2% significantly higher than that in male dancer 3.2%. The mean age at the time of injury was 24.6(range 15-49year). Student dancer had the highest incidence followed by other dancers.^(7,8)

In contemporary dance, the thigh had significantly higher rate of injury in relation to trunk/hip.^(7,8) As short iliopsoas group pulls the spine into hyperlordosis and anteriorly tilted pelvis which put stress on the spinal muscles.^(9,10)

Posterior femoral gliding technique would improve hip flexion range of motion and reduce the tightness greater than iliopsoas stretching.⁽¹¹⁾ The valid test used to measure iliopsoas muscle tightness is reported in Thomas test.^(12,13)

Hence, the objective of this study is to find out the effectiveness of posterior femoral glide technique for iliopsoas pain and tightness in contemporary dancers.

2. Materials and Methodology

The study was carried out with samples of contemporary dancers in SDFX dance crew, Cuddalore with the duration of 3 months in pilot study. A total of 15 subjects were approached for this study, all the subjects were screened by inclusion and exclusion criteria. The inclusion criteria includes age group 15-25 years, both male and female were included in the study and individuals with the Thomas test positive with Unilateral/bilateral iliopsoas tightness and Contemporary dancers, dancing for more than 1 year and individuals with Numerical Pain Rating Scale (moderate) while exclusion criteria includes individuals with Recent injuries in lower extremity, Hypermobility of hip, Congenital deformity, Contemporary dancers, who dance for less than 6 months were excluded. The materials are Couch, Universal goniometer, Assessment sheet, Consent form, Numerical pain rating scale chart.

3. Outcome Measures

Thomas Test

The Thomas test is used to assess a hip flexor contracture, the most common contracture occurs in iliopsoas of hip. The patient lies supine while the examiner checks excessive lumbar lordosis, which is usually present with tight hip flexor. The examiner flexes one of the hips, bringing the knee to chest (same side) to flatten out the lumbar spine and

to stabilize the pelvis. The patient holds the hip against the chest. If there is no flexion contracture, the hip begins rested on the examiner table. If a contracture is present, the patient leg rises off the table and the test is positive. Goniometry measurements were taken from same joint angle.

HFA (hip flexor angle):

Axis: Greater Trochanter of the femur.

Movable Arm: It is placed over the lateral aspect of the thigh (head of fibula).

Stable Arm: It is placed parallel to the couch.



Figure 1: Thomas Test (Iliopsoas Tightness)

Numerical Pain Rating Scale

Assessment of pain is essential for both clinical trials and effective pain management. Numerous instruments have been developed for different types and subtypes of chronic pain qualitative aspects of impact on function. Pain intensity rated on a 0-10 NPRS and the amount of any rescue analgesics used: 10-20% decrease in pain intensity is considered minimally important, at least 30% decrease is moderately important, and more than 50% decrease substantial improvement.

Table 1: Shows rating and pain level

Rating	Pain Level
0	No pain
1-3	Mild pain (nagging, annoying, interfering little with Activity of daily livings)
4-6	Moderate pain (interferes significantly with Activity of daily livings)
7-10	Severe pain (disabling, unable to perform Activity of daily living)

4. Procedure

The subject those who fulfill the inclusion criteria were participated in the study. Such eligible subjects were selected in the study after obtaining informed consent. The subjects were assessed by using the Thomas test. The technique given in the study is posterior femoral glide technique.

The total of 15 subjects is taken. The subjects will receive posterior femoral glide technique.

Posterior femoral glide: (To improve hip flexion)

The dancer lies on the supine position with hips at the end of the table. The dancer helps stabilize the pelvis and lumbar spine by flexing the opposite hip and holding the thigh against the chest with the hand.

The therapist stands in between the patient's thigh. Place my distal hand under distal thigh. Place my proximal hand on the anterior surface of the proximal thigh.

Mobilizing Force:

Keep the therapist elbows extended and flex the knee; apply the force through my proximal hand in a posterior direction.

Repetition: 4-5glide for 1 min.

Session: 2 session/day



Figure 4: Posterior Femoral Glide Technique

Maitland Grading:

GRADE I: Small amplitude rhythmic oscillation are performed at the beginning of the range. They are usually rapid oscillation, like manual vibration.

GRADE II: Large amplitude rhythmic oscillation is performed within the range, not reaching the limit. They are usually performed at two or three per sec for 1 to 2min.

GRADE III: Large amplitude rhythmic oscillations are performed up to the limit of the available motion and are stressed into the tissue resistance. They are usually performed at two or three per sec for 1-2 min.

GRADE IV: Small amplitude rhythmic oscillation are performed at the limit of the available motion and stressed into tissue resistance. They are usually rapid oscillation, like manual vibration.

5. Statistical Analysis

Data Analysis

The collected data were normally distributed, the mean and standard deviation were used to assess all the parameters of data using social science statistics calculator.

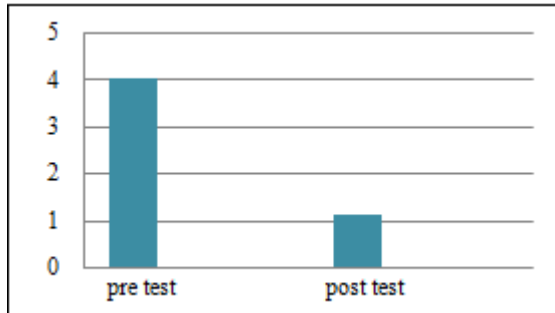
To find the difference between mean and standard deviation value of pre- test and post-test of NPRS and ROM of hip of a subject treated with posterior femoral glide technique were calculated using paired 't' test. Statistical significant was set at $p < 0.0001$ was considered as a significance difference.

Table 1

The pre and post difference of NPRS (Numerical Pain Rating Scale) test of experimental group (right) of pain mean and standard deviation was analyzed statistically tested by paired t-test. The result is presented in table-1.

NPRS Score - Experimental Group

	N	Mean	S.D	P-Value
Pre test	15	4.06	1.06	p-0.001
Post test	15	1.13	0.2	



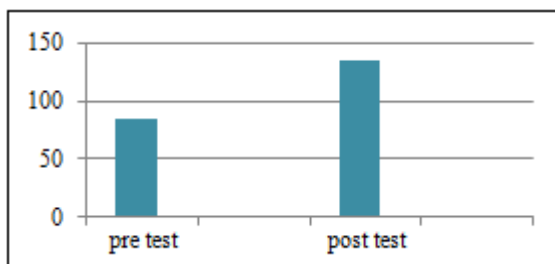
From table – 1 it is concluded that there is highly significant improvement in NPRS in the experimental group.

Table 2

The pre and post difference of experimental group of ROM of hip joint mean and standard deviation was analyzed statistically tested by paired t- test. The result is presented in table-2.

ROM of HIP flexion Experimental Group

	N	Mean	S.D	P-Value
Pre test	15	86.0	21.55	p-0.001
Post test	15	135.3	33.9	



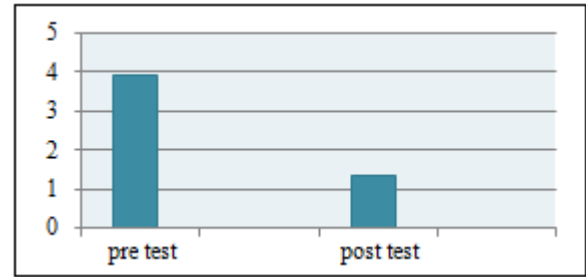
From table – 2 it is conclude that there is highly significant improvement in ROM of hip flexion in the experimental group.

Table 3

The pre and post difference of NPRS (Numerical Pain Rating Scale) test of control group of pain mean and standard deviation was analyzed statistically tested by paired t-test. The result is presented in table-3.

NPRS Score – Control Group

	N	Mean	S.D	P-Value
Pretest	15	3.93	0.65	p-0.001
Posttest	15	1.33	0.36	



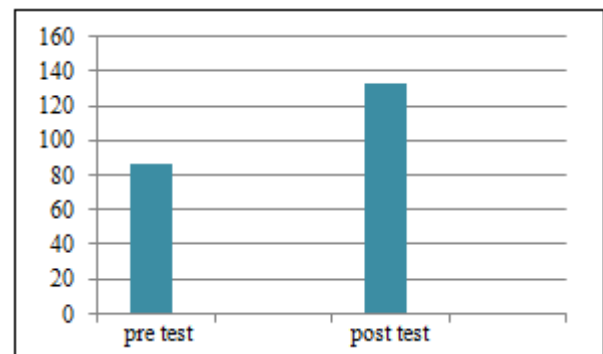
From Table – 3 it is concluded that there is highly significant improvement in NPRS in the control group.

Table – 4

The pre and post difference of control group of ROM of hip flexion mean and standard deviation was analyzed statistically tested by paired t-test. The result is presented in table-2.

ROM of Hip Flexion- Control Group

	N	Mean	S.D	P-Value
Pretest	15	87.0	27.78	P-0.001
Posttest	15	133.6	33.18	



From table – 4 it is concluded that there is highly significant improvement in ROM of hip flexion in the control group.

Table 5: Comparison of NPRS scores of experimental and control group

Another important variable of interest is to study the post treatment difference of NPRS score between experimental and control group. For these independent two samples t-test is used and result is presented in table-5.

	N	Mean	S.D	P-Value
Experimental group	15	1.13	0.28	0.001
Control group	15	1.33	0.36	

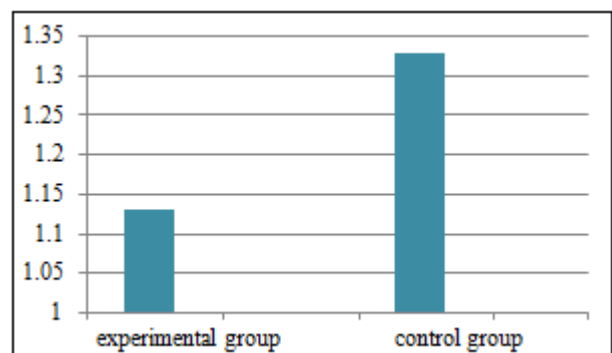
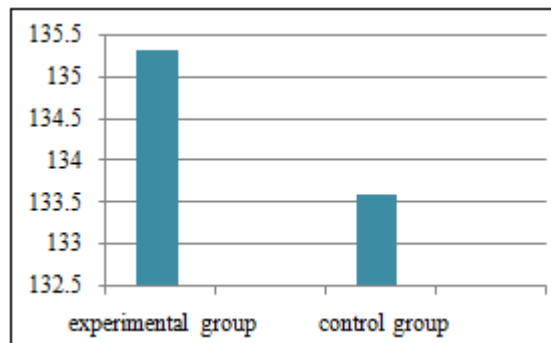


Table – 6**Comparison of ROM of hip score of experimental and control group**

Another important variable of interest is to study the post treatment difference of ROM score of hip flexion between experimental and control group. For this independent two sample t – test is used and result is presented in table-6.

ROM of Hip Flexion Score between Groups

	N	Mean	S.D	P-Value
Experimental group	15	135.3	33.9	0.001
Control group	15	133.6	33.8	

**6. Discussion**

The purpose of the present study was to determine whether there was any clinical benefit of posterior femoral glide technique for iliopsoas pain and tightness in contemporary dancers.

The technique performed to the subjects showed significantly changes and also relieved pain. There was sustained improvement observed during the two weeks of the treatment period in the group.

The data showed that the use of three month protocol a significant difference post value of Thomas test and NPRS (Numerical Pain Rating Scale).

Based on the inclusion criteria, the subjects have been selected with the age group of 15 – 20 years, both male and female have been selected and 15 subjects were treated with posterior femoral glide technique. Pre-test of NPRS and Thomas test on baseline, before and after three month treatment was assessed. Statistically analysis was made, using paired ‘t’ test. The result showed better relief from tightness, thereby improving the flexibility.

MD, DAVID SWANSON , BS, GARRET GAROFOLO et al., the conclusion of the study shows that conservative treatment with medication, modification and Physical therapy regimens as the primary treatment for iliopsoas syndrome achieved best results.⁽⁴⁾

CAROLYN KISNER, PT, MS, LYNN ALLEN COLBY, PT, MS..., MAITLAND’S mobilization ed-7 The author concluded that posterior femoral glide technique improve hip flexion range.⁽¹¹⁾ In this present study implies that posterior femoral glide technique can be used for treating iliopsoas tightness. Hence in this study, the subjects are very

much benefited and significantly improved with posterior femoral glide technique.

7. Result

The obtained data was analyzed by using ‘t’ test and paired ‘t’ test. Comparison of the mean value of pre – test and post – test of NPRS and ROM scale and also post treatment difference of NPRS and ROM scale between experimental and control groups.

In experimental group, the mean value of NPRS score before treatment is 4.06 and after application of treatment is 1.13. The ‘P’ value is 0.001. It is concluded that there is highly significant in NPRS.

In experimental group, the mean value of ROM of hip before treatment is 86 and after application of treatment is 135.3. The ‘P’ value is 0.001. It is concluded that there is highly significant in ROM.

In control group, the mean value of NPRS score before treatment is 3.93 and after application of treatment is 1.33. The ‘P’ value is 0.001. There is highly significant improvement in NPRS.

In control group, the mean value of ROM of hip before treatment is 87 and after application of treatment are 133.60. The ‘P’ value is 0.001. There is highly significant improvement in ROM of hip.

Comparison of post treatment difference of NPRS and ROM score between experimental and control group. The ‘P’ value is 0.001. It is concluded that highly significant in NPRS and ROM of hip.

8. Conclusion

This study concluded that posterior femoral glide technique have got beneficial effect in improving the hip flexion range in contemporary dancers with iliopsoas tightness.

9. Limitations and Recommendations

In this study, Small size of sample was taken. Very short duration of treatment was given. This study was limited to assess only pain and iliopsoas tightness. Only two outcome measures are used in this study and various manual therapy techniques can be used and compared, Lengthy study duration can be adopted, large samples can be used, Experimental and control group can be analyzed, any other outcome measures related to applied technique can be recommended.

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