

Prevalence of Piriformis Tightness Among Pregnant Females

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ABSTRACT

Objective: To study the prevalence of piriformis tightness among pregnant females in 3rd trimester.

Methodology: A total of 201 participants were selected according to the inclusion and exclusion criteria. A written informed consent was taken from the participants in the language best understood by them. The study participants were explained about the procedure. The test is performed on both side of legs. A positive test is indicated by pain over the buttock area and tenderness to touch that shows the piriformis tightness. The data was collected and statistically analyzed.

Results: 79.5% of the total population assessed had piriformis tightness in 3rd trimester. When assessed the results of both right and left leg it was found that, 24.7% had tightness in right leg and 24.7% had tightness in left leg. It was also found that 30.1% of the test-positive population had bilateral tightness while 20.5% had no piriformis tightness

Conclusions: Study found that there was prevalence of piriformis tightness among pregnant females (third trimester) due to biomechanical changes and most of the patients reported mild pain in piriformis tightness during 3rd trimester.

Key words: Pregnant females, piriformis tightness, FAIR Test, biomechanical changes

Introduction

Piriformis tightness refers to a neuromuscular issue marked by discomfort in the hip and gluteal region due to irregularities in the piriformis muscle.^{1,2} During pregnancy, women experience significant anatomical and physiological transformations to accommodate the heightened physical and metabolic demands of gestation.² Prolonged sitting position, biomechanical changes during pregnancy are the foremost cause of piriformis tightness in females that may eventually leads to piriformis syndrome and low back pain.²

In clinical practice, this tightness is usually misdiagnosed with other spinal disorders.¹ Piriformis syndrome is more common in women with ratio 3:1. In Lasegue sign, pain is felt on localized area of piriformis muscle during hip and knee flexion.^{1,3}

The three-cornered piriformis muscle is situated in the hip beneath the gluteal muscles. It is an essential postural muscle in the pelvic area and an exceptionally robust muscle. The sciatic nerve can go through multiple routes from the piriformis muscle. In a lot of individuals, the sciatic nerve course is straight under the muscle, whereas in 15% of people, the sciatic nerve pierces through the muscle, which is the most significant explanation for radiating piriformis discomfort.³

Other studies found that piriformis syndrome affects 17.2% of people. Approximately all piriformis syndrome patients claimed alleviation after receiving a piriformis muscle injection. However, there is no confirmed link between spine disorders and piriformis syndrome. Piriformis syndrome ratio between male and female is 6:1.^{3,4}

It might be due to a kinematic difference in females with a wider pelvis and a greater Q angle. Overuse pertains that trigger piriformis discomfort in pregnancy are prolonged sitting, faulty positioning, and uneven compressions at the buttock area. If lateral movements are not counterbalanced by recurrent forward bending, it can lead to tight adductors and weak abductors. This means that stress will be placed on the piriformis muscle if abductors fail to operate adequately. Entrapment of the sciatic and pudendal nerves can result from stiffness in the piriformis muscle. The sciatic nerve is constricted, which causes piriformis syndrome symptoms. Injury and recurrent usage are to blame. Internal hip rotation puts strain on the piriformis muscle during the stance phase of the gait cycle. Hence, during the stance period, this muscle is under strain. According to another theory, the piriformis muscle's hypertrophy puts it at higher risk of injury. Leg length issues, for instance, are exacerbated by

gait issues, which lead to an excessive amount of internal rotation of the hip. Not all patients experience swelling, but piriformis muscle spasm can also cause a noticeable hard mass shaped like a sausage in the buttock. Hip external rotation is impacted by shortened piriformis muscle as well. The foot of the afflicted extremity rotates externally when the patient with piriformis syndrome rests supine; this is referred to as the positive piriformis sign, which is a crucial diagnostic for the condition. Additionally, there is discomfort while attempting to return the foot to its midline position.⁵

Using the FAIR test (flexion, adduction, internal rotation) and the piriformis stretch test, individuals were identified with piriformis syndrome following a clinical assessment. Piriformis tension is one of the risk factors for sciatica, a condition that can radiate to the lower extremities and produce low back or buttock discomfort. Piriformis syndrome is a crucial component to take into consideration while looking for alternative causes of sciatica pain. Furthermore, if the female with sciatica also has dyspareunia, this aspect becomes even more significant.⁶ Patients typically describe their pain in unclear terms. They report pain as originating in the buttocks, groin, hip, or tailbone, or as radiating down the back of the leg (sciatica). The piriformis muscle can squeeze or inflame the sciatic nerve, resulting in piriformis syndrome, a neuromuscular condition. This results in discomfort and numbness along the sciatic nerve's path from the low back to the thigh and down the leg in the buttocks. Pain and instability are the primary symptoms of Piriformis syndrome. Although the precise anatomical location of the pain is not specified, it is nonetheless reported to be in the hip, lower leg, tailbone, buttock, and groin regions. The history and physical examination play a crucial role in the diagnosis of piriformis tightness and low back pain.

Methodology

Cross sectional-descriptive study from different hospital (Gynecological wards) PIMS hospital Islamabad Quaid e azam hospital Islamabad DHQ hospital Rawalpindi CMH hospital Rawalpindi HOLY family Rawalpindi. Non-probability convenient sampling technique was used. Slovin's formula for sample size Confidential interval =95% margin of error(a-error) 0.05% where N is population size n is sample size e is margin of error $n=N/(1+Ne^2)n=406/(1+406\times 0.05^2)$

$n=406/(1+406\times 0.0025)n=406/(1+1.015)$
 $n=406/2.015 n=201.5$ (After applying inclusion & exclusion criteria $n=166$)

Pregnant females aged 20-35 of 3rd trimester Piriformis tightness with FAIR test were included in the study. Any neurological conditions related to lower limb and spine Any psychological condition Any fracture or recent trauma. Female diagnosed with fibromyalgia and female with sacroiliac joint dysfunction were excluded from the study. A Qualitative variable FAIR test NPRS was employed. Data were collected by using semi-structured questionnaire.

Permission was granted by the Institutional Review Committee (IRC) / Ethical Review Board (ERB) of The University of Lahore, as well as by the respective Heads of Department at both the University of Lahore Islamabad Campus and the University Institute of Physical Therapy of The University of Lahore. Everyone who took part gave their consent. A permission form was signed by research participants who want to take part. The participants were given a semi-structured questionnaire that asked about the frequency of piriformis tightness in pregnant women.

The data normality were checked by using Statistical Package for Social Sciences software version 25.0. After checking the normality of data. It was found that p value was <0.05 hence data were not normally distributed so median and interquartile range was calculated for quantitative variable and frequencies/percentages were calculated for qualitative variables.

Results

Normality of data was checked by Kolmogorov-Smirnov (KS) Test. p value was <0.05 so data was not normally distributed and we used median and interquartile range. Out of 201 participants, 35 were excluded on the basis of exclusion criteria and 166 were included on the basis of inclusion criteria. The dispersion of participation among various age groups. Of the sample, 96 (57.8%) belonged to the 20–27 age group, and 70 (42.2%) to the 28–35 age group.

About 132 individuals, or 79.5%, produced good findings, indicating the presence of the desired quality or result. On the other hand, 34 individuals (20.5%) provided unfavorable findings.

The distribution of percentages for the Numerical Pain Rating Scale is shown in figures 1-3, which also show the proportion of fair tests and the percentage of buttock pain.

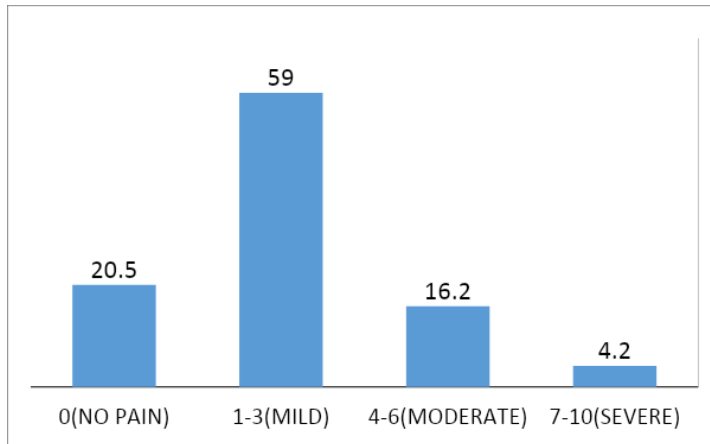


Figure 1. Shows percentage of NPRS (Numerical pain rating scale)

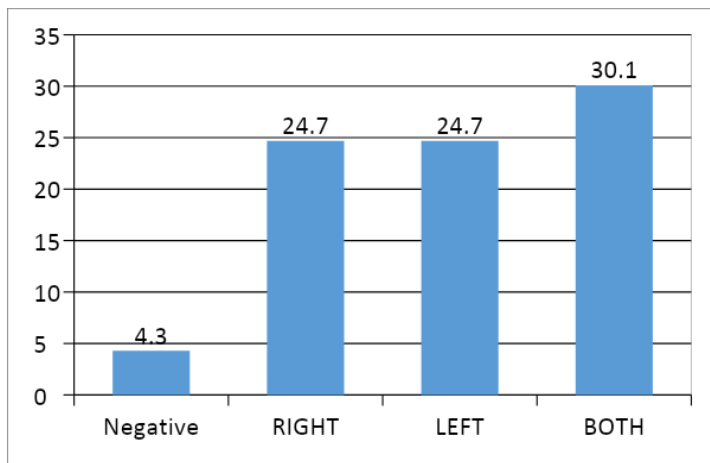


Figure 2: shows percentage of fair test.

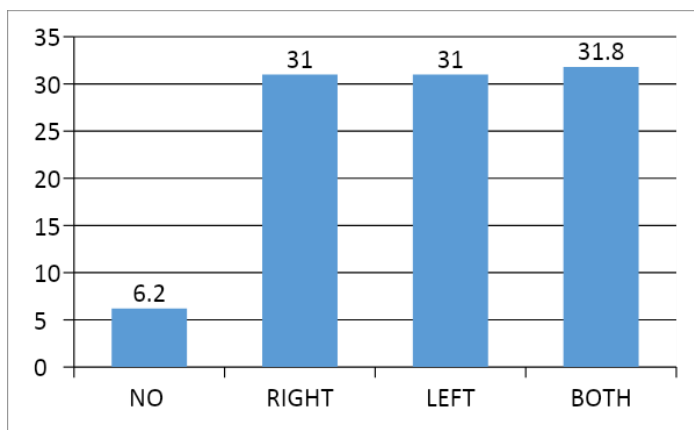


Figure 3. Shows percentage of Tenderness in buttocks

Discussion

A study was conducted on pregnant female in third trimester by Priyanka Rathore in March, 2022 to check the prevalence in piriformis tightness showed

29% pregnant females had tight piriformis. As underlying condition biomechanical changes, prolonged sitting, hormonal changes. As they used graph pad prism software, prevalence was found less in 3rd trimester as 29% because of relaxin hormone. However, it was statistically significant and there was less prevalence of piriformis tightness in 3rd trimester.⁶

Current study showed 79.5% pregnant females had tight piriformis in third trimester. As SPSS was used and it was found that there is more prevalence of piriformis tightness in 3rd trimester.

A study was conducted by Malika Mondal et al., in 2017 on piriformis tightness in males and females. The study revealed that 79.5% of the participants had piriformis tightness. The third decade has the highest prevalence of tightness in the piriformis. But there was no statistically significant difference in the prevalence of piriformis tightness in males and females.⁶ Current study shows the same prevalent percentage but with only pregnant female population in 3rd trimester.

Vullo et al. (1996) conducted a study focusing on hip pain during the postpartum period. The aim was to explore the prevalence and characteristics of lower extremity pain, particularly in the hip and lower region, among women of childbearing age.⁷ Additionally, the study aimed to evaluate the impact of recent pregnancy on these symptoms. The findings revealed that postpartum subjects exhibited a higher prevalence of hip and buttock pain, accounting for 38% of cases. Furthermore, a history of previous pain complaints emerged as a risk factor for lower extremity pain during pregnancy. Pregnant and postpartum women were observed to be more susceptible to developing lower extremity symptoms compared to nulliparous women. Current study shows that 59% pregnant females with 3rd trimester had mild pain and 31.8% had tenderness at hip on bilateral side.⁸⁻¹⁰

Conclusion

Our study showed that there was prevalence of piriformis tightness among pregnant females due to biomechanical changes and most of the patients reported mild pain in piriformis tightness in third trimester. The likelihood of developing piriformis syndrome, which can subsequently lead to low back pain, is higher in the adult population due to

increased susceptibility to piriformis muscle tightness.

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