

Evaluation of Piriformis Syndrome in Patients with Low Back Pain Reporting to Public Medical Teaching Institutes in Peshawar

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ABSTRACT

Background: Piriformis Syndrome is a condition in which damage to the piriformis muscle causes pain in buttock and leg. Robinson described the syndrome as having six key characteristics. Before 1934, it was considered that the sciatica can be caused by impingement of sciatic nerve in pelvic, but new diagnostic technology suggests that it can also be caused by distal foraminal entrapment and Piriformis Syndrome. Piriformis syndrome is underrated and mostly neglected by clinician though it can be a cause of low back pain.

Objectives: To evaluate the piriformis syndrome in patients complaining of low back pain.

Methods: This study was carried out at three different Public Medical Teaching Institutes. Duration of study was 6 months i.e., from March 2018 to August 2018. Sample size of the study was 337 and four different physical tests were performed on patients for diagnosis of Piriformis syndrome.

Results: Piriformis Syndrome was diagnosed among 111(32.9%) study participants among which 56 were male and 55 were females.

Conclusion: Every third patient of low back pain was diagnosed with Piriformis Syndrome. Male to female ratio of Piriformis Syndrome was 1:3.

Key words: Gluteal Region, Low back pain, Piriformis Muscle Syndrome, Sciatic Nerve.

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Introduction

Piriformis Syndrome is a condition that occurs due to irritation of sciatic nerve by piriformis muscle which causes buttock and hip pain. In the lower limb, there is numbness in the posterior medial aspect. This condition is similar in presentation to a true radiculopathy of L5 or S1.(1) It is said to be the secondary cause for the sciatica, low back, and buttock pain. This Syndrome is usually described as a deep, aching type pain with or without signs and symptoms of sciatica along with numbness, pain, and localized tenderness in the area of piriformis muscle. Piriformis syndrome can have comparative presentations as other somatic pain issue, for example, intervertebral disk pathology, lumbosacral radiculopathy (sciatica), sacroiliac disarranges, and trochanteric pathology. (2)

The piriformis muscle is a level, triangular molded, and profound situated gluteal muscle.(3) The piriformis muscle goes about as an outer rotator, powerless abductor, and weak flexor of the hip, giving postural stability amid ambulation and

standing. The piriformis muscle is innervated by spinal nerves S1 and S2 and occasionally likewise by L5.(1, 4) In most patients, the sciatic nerve lies below the piriformis muscle, sciatic nerve bifurcate piriformis in 12% of population.(5)

Piriformis Syndrome was first portrayed by Yeomen in 1928.(6) The term "Piriformis Syndrome" was first utilized by Robinson in 1947 when he described the syndrome as having six key attributes: a background marked by injury or direct tumble to the buttock, gluteal or sacroiliac pain transmitting down the leg that regularly constrains ambulation, gluteal decay, a substantial sausage formed mass, positive Lasègue sign, and compounding with bowing or lifting.(4) Ten years after Robinson, a specialist by the name of Freiberg built up a more compact arrangement of criteria for characterizing Piriformis initiated sciatica. Freiberg's three signs for piriformis-instigated sciatica included the sciatic notch tenderness, positive Lasègue (straight leg raise) sign, and change with nonsurgical treatment.(7) Before 1934, it was considered that the sciatica can be caused by impingement of sciatic nerve in the pelvis but new diagnostic technology suggests that it can also be caused by distal foraminal entrapment and piriformis syndrome.(8)

Clinical signs relate, either specifically or by implication, to muscle spasm, coming about nerve

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pressure, or both, tenderness at palpation over the greater trochanter. A few patients have a "sausage formed" mass in the buttock caused by compression of the Piriformis muscle.(1)

The most common symptoms of Piriformis Syndrome include pain increasing after sitting for a prolong time usually more than 15 to 20 minutes. Mostly patients have buttock pain, difficulty in ambulation and pain in internal rotation, hip flexion, adduction of the same side leg, piriformis muscle spasm and dysfunction of sacral region. Compression of the fibular branch of the sciatic nerve frequently causes pain or paresthesia in the back of thigh.(1, 9)

Clinical signs relate, either specifically or by implication, to muscle spasm, coming about nerve pressure, or both, tenderness at palpation over the greater trochanter. A few patients have a "sausage formed" mass in the buttock caused by compression of the piriformis muscle.(1)

In Pakistan, there is a limited literature on prevalence of piriformis syndrome in LBP. The purpose of this study is to raise awareness that piriformis syndrome can be a cause of the lower back pain, so it can be considered in diagnosis and preventive measures could be taken on time.

Methods:

This descriptive study was carried out at three Medical Teaching Hospitals i.e. Khyber Teaching Hospital, Leady Reading Hospital and Hayatabad Medical Complex. Total duration of study was 6 months (from March to August 2018) and sample size calculated for the study was 337. The sample size was calculated by sample calculator in which the prevalence of piriformis syndrome i.e. 32.42% was taken from a literature with a confidence interval of 95% and 5% marginal error. Both male and female patients with low back/buttock pain aged between 20-70 years, willing to participate, were included in the current study, while patients with recent discectomy, with hip/knee pathology, with fractured hip/knee, with malignancy, patients do not meet the above mentioned criteria were excluded from the study. Convenience sampling method was used which means every person, both male and female, meeting the inclusion criteria, was included. Total four special tests such as FAIR test, Pace Sign, Beatty Sign and Freiberg test were used for the diagnosis of piriformis syndrome. Any 3 positive tests among these 4 confirmed diagnosis of piriformis syndrome. Ethical approval was taken from Institutional Research and Ethical Committee of NCS University System, Peshawar (NCS/PT&R/201/18). Permission of data collection was also taken from the responsible authorities of the said hospitals. For data collection procedure,

researchers' team went to the concerned department of the above-mentioned Public Teaching Hospitals and examined all the patients matching the inclusion criteria. Verbal consent was also taken from participants and their privacy and confidentiality was completely ensured. Data was analysis by SPSS 21. Descriptive analysis was done and for association chi square was applied. P value of <0.05 was considered significant.

Results:

This study concludes that the frequency of piriformis syndrome in patients with low back pain was 111(32.9%) where as 226(67.1%) were tested negative for piriformis syndrome. Total numbers of male participants in the current study were 185 and females were 152. Females were more affected than male as shown in Table 1 and most affected age group was 20-40 years. Among special tests, the FAIR and Freiberg test was relatively more specific than Beatty and Pace Sign as shown in Table 2.

Table 1: Showing the Gender of the Participants

Variables	Attributes	Gender of the Participants		P-Value
		Male	Female	
Piriformis Syndrome Status	Positive	30.27% (n=56)	36.18% (n=55)	0.032
	Negative	69.73% (n=129)	63.82% (n=97)	

Table 2: Showing the distribution of positive and negative tests

Tests	Attributes	Piriformis Syndrome Status		P-value
		Positive	Negative	
FAIR Test	Positive	98.2% (n=111)	1.8% (n=2)	0.001
	Negative	0.0% (n=0)	100.0% (n=224)	
Beatty Sign	Positive	97.5% (n=79)	2.5% (n=2)	0.02
	Negative	12.5% (n=32)	87.5% (n=224)	
Freiberg Test	Positive	89.5% (n=94)	10.5% (n=11)	0.02
	Negative	7.3% (n=17)	92.7% (n=215)	
Pace Sign	Positive	96.6% (n=85)	3.4% (n=3)	0.004
	Negative	10.4% (n=26)	89.6% (n=223)	

Discussion:

Piriformis Syndrome is a condition occurred by irritation of sciatic nerve by piriformis muscle which causes buttock and hip pain. In the lower limb, there is numbness in the posteromedial aspect. This condition is similar in presentation to a true radiculopathy of L5 or S1. (1) The Piriformis muscle is a level and triangular molded, profound situated gluteal muscle. It starts from the front of

the sacrum, sacroiliac joint container, sacro tuberos tendon, predominant edge of more prominent sciatic score, and embeds at the upper part of greater trochanter.(3) Piriformis Syndrome is a condition which damages to the Piriformis muscle; causes pain in buttock and leg. It was first portrayed by Yeomen.(6) Before 1934, it was considered that the sciatica can be caused by impingement of sciatic nerve in the pelvis, but new diagnostic technology suggests that it can also be caused by distal foraminal entrapment and Piriformis Syndrome.(8) Among the low back pain patients, prevalence of Piriformis Syndrome was 17.2%.(2) According to Bernard et al., the prevalence of Piriformis Syndrome in low back pain patients was 0.33%, Pace and Nagle as 6% and Parziale as 5%.(10)

Research on Piriformis Syndrome is lively all over the world, but the knowledge has still not developed that much in Pakistan. There is a limited literature about the prevalence of Piriformis Syndrome in Patients with low back pain in Khyber Pakhtoon Khwa. Our study was designed to identify the prevalence of piriformis syndrome in patients with low back pain, reporting to Government Medical Teaching Institute (MTI) Peshawar, Khyber Pakhtoon Khwa, Pakistan. The simple size was calculated as 337 in which 184 were male and 152 were female participants. The results of our data reveal that among all 337 participants 111(32.93%) reported positive response toward piriformis syndrome while the remaining participants 226(67.11%) out of 337 participants were not affected by piriformis syndrome. Generally, we took a range of 20%-40%, a previous study falling in this range will be in favor of the current study, while below 20% will not support the current study. A study was conducted by Mondal M et al. at Department of Physiotherapy, National Institute for Locomotor Disabilities. The study period was from April 2016 to December 2017. According to this study, the prevalence of Piriformis Syndrome was 79.5% which strongly supports the results of the current study.(11) Another study was conducted by Kean Chen C, and Nizar AJ in Hospital University of Science in Malaysia, Kelantan. The prevalence according to this study was 17.2% which supports the results of our study.(2) Another study was conducted at the department of orthopedics and the department of physical medicine and rehabilitation, RIMS in Imphal by Singh US et al. According to this study, the prevalence was 6.25 which does not support the results of the current study.(12) This difference can be due to different sampling technique, different study settings and population

and can also be due to different diagnostic criteria. Though the occurrence of piriformis syndrome is notorious, but Pace and Nagle, Jawish et al, Keskula and Tamburello, Boyajian-O'Neill et al mentioned a range which is 5-36%.(12) Epidemiological figures of the prevalence were not well- defined, but are assessed to be around 12.2% to 27%,(13) as supported by Usham et al. in his study, using same 4 special tests for diagnosis of piriformis syndrome. He reported the prevalence around 6%. This conflict in the results may be due to different population. Further, he reported that FAIR test is most reliable test for diagnosis of piriformis syndrome as its percentage was 93% in affected population which is almost same as our results.(12) On other hand, a literature review was done by Hopiyan et al which also reported the FAIR test to be more effective and diagnostic of piriformis syndrome which evidently supports our results.(14) The main limitations of the current study were the nature of the cross-sectional survey and the convenience sampling technique used.

Conclusion:

Most of the patients with low back pain were diagnosed with Piriformis Syndrome. Male to female ratio of Piriformis Syndrome was 1:3.

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Conflict of interest: Authors declare no conflict of interest.

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Author Contribution:

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Yasmin A: Interpretation of data and writing of the manuscript

Khan FM: Analysis of data and writing of the manuscript

Kashif M: Interpretation of data and analysis

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