Prevalence of Piriformis Syndrome in Working and Non Working Women with Low Back Pain

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ABSTRACT:

Background: Piriformis muscle syndrome is often over looked in the clinical practice as its presentation resembles with other pathology (back, buttock, and leg). Due to its inconsistent objective findings, it is often considered as a diagnosis of exclusion. Familiarity with the prevalence will, therefore, increase its awareness about diagnosis.

Objective: The objective of this study was to determine the prevalence of piriformis syndrome in working and non-working women with low back pain

Methodology: This comparative cross sectional study was done by using non-probability purposive sampling on 88 low back female patients. They were, then, divided into working and non-working women groups. FAIR test and piriformis stretch were used to diagnose the piriformis muscle syndrome.

Results: On the basis of above mentioned diagnostic criteria, prevalence of piriformis syndrome was found in 76 (86.36%) women. Of which, 35 (80%) patients werein working group while 41 (93%) patients belong to non-working group.It is found that this syndrome is common in both working and non-working women. However, there is no significant difference found between two groups (p-value = 0.06) in term of prevalence.

Conclusion: Due to high prevalence of piriformis muscle syndrome among female patients with low back pain, clinicians must consider its possibility during differential diagnosis of low back pain. There is also a need to develop an awareness program of disability and the piriformis muscle syndrome among women.

Keywords: Piriformis Muscle Syndrome, Low Back Pain, FAIR Test, Physical Therapy

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INTRODUCTION:

Low back pain is most common musculoskeletal problem.(1) The scope of disease and death rate for low back pain is high. Many people have complaint of low back pain, however, their pain is self-limiting and gets settled without any special treatment. But for others, back pain is periodic and chronic. It affects their job and life both. Scarcely acute back pain is sign of serious medical problem, that includes infection, systemic problem or any other.(2)Factors that contribute for low back pain as risk factor are poor nutrition, low socio-economic status, stagnant lifestyle, prolonged single postures and history of LBP.(3)

One of the risk factor that can cause low back or buttock pain with radiation to lower extremity (sciatica) is Piriformis syndrome. When seeing for differentials of sciatica pain, piriformis syndrome is the important factor to consider. And this factor has more importance if that female with sciatica also has dyspareunia. Pain location describe by patient is usually vague. They describe pain as in the hip, tailbone, buttock or groin, or radiating down back of leg (sciatica).(4) Piriformis syndrome is a neuromuscular disorder that takes place when sciatic nerve is pinched or inflamed by the piriformis muscle. This causes pain, altered sensation, lack of sensation in the buttocks all the way of sciatic nerve course from low back to thigh and down the leg.(5)

Main features of Piriformis syndrome (Figure below) are pain and instability. The anatomical area for pain is not accurately pointed out but still described on hip, lower leg, tail bone, and buttock and groin region. Past history and physical examination are important in diagnosis of low back pain and piriformis syndrome.(6)

The piriformis muscle is three-cornered muscle, which is located below the gluteal muscles in buttock. It is very powerful muscle and important postural muscle in pelvis area. There are different routes of passing of sciatic nerve from piriformis muscle. In many people, sciatic nerve course is directly under the muscle while in 15% of people, sciatic nerve pierces through the muscle and this is the most important reason for radiating pain of piriformis. This is neurological compression.(7)In 1928, Yeoman point out the main cause of piriformis muscle is sciatica. He suggested that, as sciatic nerve and sacroiliac joints are in located in nearby location, so fibrous connective tissue of piriformis muscle is reason for sciatica.(8)

This all discussion was earlier than Mixter and Barr's article. In 1934, they first told that radiating pain is due to the breakup of inter vertebral disc.(9) Irrespective of advancement in procedures of electromyography studies and magnetic resonance imaging (MRI), piriformis still treated as rule out diagnosis and also people have very little understanding of this problem. A latest interview of physiatrists showed that, there is deficiency in agreement on statements. First whether diagnosis of piriformis syndrome is possible or if it is possible than how to make it.(10)

Other research showed that pervasiveness of piriformis syndrome in low back pain patients is 17.2%. Approximately all patients of piriformis syndrome reported relief from injection in piriformis muscle. But there is no relation documented for spine problems and piriformis syndrome.(11) Piriformis syndrome ratio for female and male is 6:1.It may be because of biomechanical difference in females with a broader pelvis and large Qangle.(12)

Overuse problems that cause PS is due to the activities that involve sitting posture like in rowing and cycling because it demands the exhausting use of leg muscles. Running, cycling

and other athletic activities that demand forward bending postures are especially responsible for piriformis syndrome, if these athletics do not do lateral stretch and strengthening exercises. Repeated bending forward activities if not balanced by lateral movements can result in weakness of abductors and tight adductors. This concludes that if abductors do not work properly, it put stress on piriformis muscle.(13)

Piriformis muscle tightness can cause entrapment of both sciatic nerve and pudendal nerve.(14)Manifestation of piriformis syndrome is due to constriction of sciatic nerve. It is due to repetitive use and injury. During gait cycle (stance phase), there is internal rotation of hip that put stress on piriformis muscle. So this muscle is under pressure during stance phase. It is also said that piriformis muscle is more on risk of injury due to hypertrophy. Gait problems enhance it, as it causes excessive internal rotation of hip for example in leg length problems.(15)

Few patients also develop swelling, a visible hard mass of sausage shape in buttock due to piriformis muscle spasm. Shortened piriformis muscle also affects external rotation of hip. When patient of piriformis syndrome lies in supine position, the foot of affected extremity rotates externally, an important diagnosis for piriformis syndrome called positive piriformis sign. And when try to place back the foot in midline position, it causes pain.(16)

MATERIALS AND METHODS:

It was a comparative cross sectional study. Data was taken from Pakistan Society for the Rehabilitation of the Disabled and Ittefaq (PSRD) hospital and was complied at Riphah International University Lahore. Non-probability, purposive sampling was used. Sample was divided further into group A and B. In group A, working women with low back pain was taken. In group B, non- working women with low back pain was selected. All women with confirmed low back pain of age range from 20-60 were included. While all patients with low back pain having history of trauma and spinal surgery or having other orthopedic disease like knee pain, disc pain, lumbago, sacroiliac pain were excluded. After clinical evaluation patients were diagnosed as piriformis syndrome using FAIR test (flexion, adduction, internal rotation) and piriformis stretch test. All collected data was entered in computer programme SPSS version 20 and analyzed through this software. Mann Whitney U test was used to compare quantitative data in working and non-working woman. Chi-square test was used to see any association between qualitative data, piriformis syndrome in working and non working women with low back pain. P-value $\leq$ 0.05 was considered as significant.

RESULTS:

The mean weight (kg) of working women was 56.57±4.57 kg with minimum recorded weight of 50 kg and maximum recorded age of 70 kg. The mean weight (kg) of non-working women was 59.57±8.75 kg with minimum recorded weight of 48 kg and maximum recorded weight of 90 kg. The mean BMI of patients in non working group was 21.67±2.976 with minimum recorded BMI of 18 and maximum recorded BMI of 30. Baseline measurement of bith groups is mentioned in table A and B. The statistical difference of mean BMI and height among the two groups was insignificant (p-values= 0.616, 0.694 respectively) whereas mean weight among the two groups was statistically significant (p-value= 0.04). On the basis of above mentioned diagnostic criteria, prevalence of piriformis syndrome was found in 76 (86.36%) women. Of which, 35 (80%) patients were in working group while 41 (93%) patients belong to non-working group. It is found that this syndrome is common in both working and non-

working women. However, there is no significant difference found between two groups (p-value = 0.06) in term of prevalence.

Table -1: **Descriptive Statistics and comparison of Duration of marriage, Gravidity and Parity (n = 63)**

Study Group		Duration of marriage (Years)	Gravidity	Parity
Working (n=29)	Mean	18.45	--	--
	Mode	15	1	1
	Std. Deviation	13.566	--	--
	Minimum	1	1	1
	Maximum	40	7	6
Non-working (n=34)	Mean	14.29	--	--
	Mode	7	4	2
	Std. Deviation	9.612	--	--
	Minimum	3	0	0
	Maximum	35	8	6
p-value		0.161	0.064	0.410

Table -2: **Descriptive Statistics and comparison of work and rest related parameters in both study groups**

		Mean	Std. Deviation	Minimum	Maximum	p-value
Working Hours	Working	7.77	2.631	4	14	0.337
	Non-working	7.27	2.203	2	12	
	Total	7.52	2.426	2	14	
Standing Hours	Working	5.73	3.106	1	14	0.633
	Non-working	6.00	2.146	3	10	
	Total	5.86	2.657	1	14	
Sleeping Hours	Working	6.30	2.064	2	10	0.272
	Non-working	5.75	2.544	1	10	
	Total	6.02	2.319	1	10	
Sitting Hours	Working	4.75	1.966	2	10	0.563
	Non-working	4.48	2.416	2	13	
	Total	4.61	2.194	2	13	

Fig-1: Prevalence of Piriformis syndrome (using FAIR test)

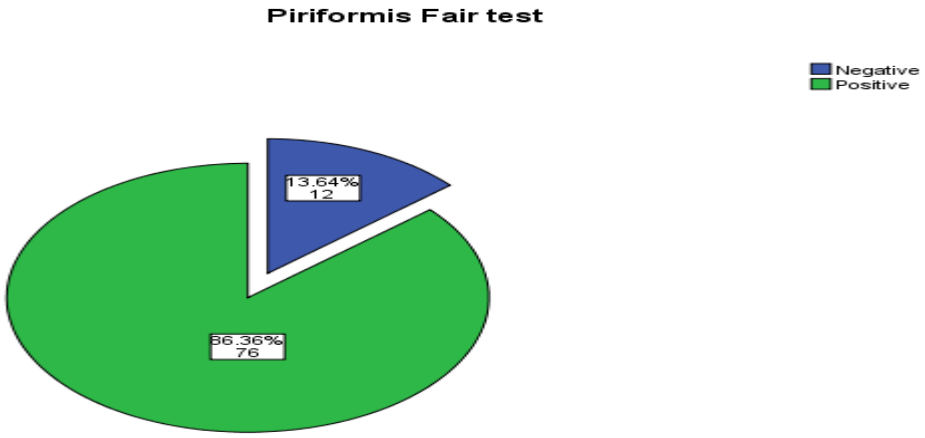
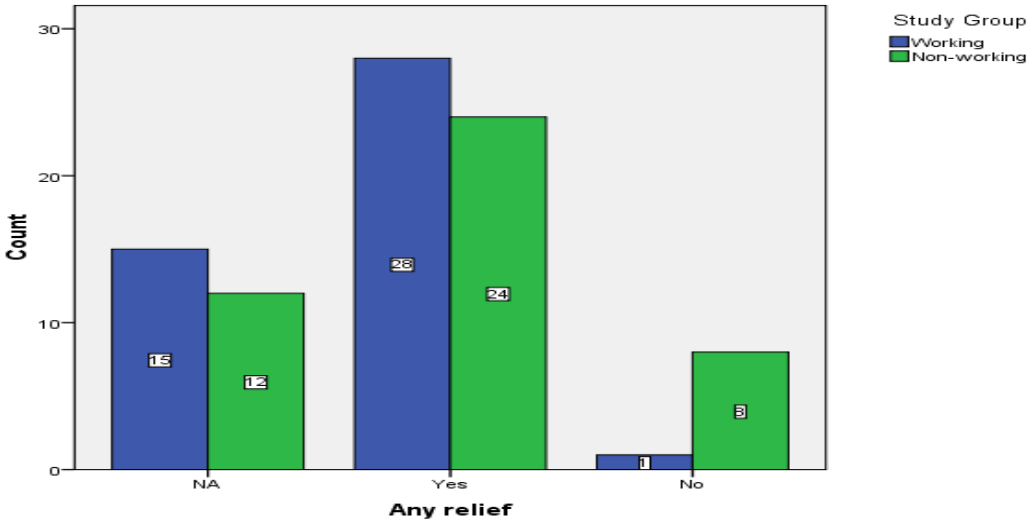


Fig-2: Comparison of Pain relief using Physical therapy treatment in both study groups



P-value = 0.048

DISCUSSION:

Piriformis syndrome is a neurological condition with characteristic feature of pain from buttock to thigh area. This disorder is ignored by many specialists because of its similarity of features from hip pathology, sacroiliac joint disorder, radiating pain from lumbar area.(17) Our finding also suggests a high prevalence of this syndrome. However, proper diagnosis of piriformis syndrome depends on understanding of anatomy of sciatic nerve and piriformis muscle and their relationship in addition to applying reliable and valid diagnostic test. Many studies have discussed about anatomy, pathology, and diagnosis and treatment strategy for this syndrome.(18)Therefore, it is important to adopt an integrated approach. The integrated procedure to diagnose piriformis syndrome consists of its anatomical understanding, function

of piriformis muscle, and detailed evaluation of patient and also understanding of mechanism how piriformis muscle can compress sciatic nerve. Studies have discussed about the treatment options of piriformis syndrome, one option is to use just physical treatment and mobilization method, and the other is to combine first option with medicines to relieve pain and swelling of sciatic nerve and piriformis muscle.(10)

We planned this study to investigate theprevalence of piriformis syndrome in working and non-working women with low back pain. The prevalence of piriformis was higher in working patients compared to non-working women. However, this difference is not statistically significant. Another study showed the same percentage.(15) Occurrence of piriformis syndrome in patients of low back pain documented about 6%-18%. Other study also highlights working women especially health care workers (nurses) suffering from piriformis syndrome. This recorded incidence correlate with the previous study.(19)Piriformis syndrome occurs most frequently during the fourth and fifth decades of life and affects individuals of all occupations and activity levels,(15) while our study showed that it is also prevalent in young female. These findings are not consistent with our study. However, we used a valid and reliable test to diagnose this syndrome. Therefore, we are confident that our finding has some grounds.

Limitations of this study are convenience sampling was used. Moreover, data was collected only from one center. Therefore, generalizability of this study should warrant caution. We only considered few baseline variables. Future research should consider all the possible confounders.

CONCLUSION:

Due to high prevalence of piriformis muscle syndrome among female patients with low back pain, clinicians must consider its possibility during differential diagnosis of low back pain. There is also a need to develop an awareness program of disability and treatment of the piriformis muscle syndrome among women. There is a need of research on this syndrome as there are many gaps in knowledge. This will help us to set up an optimal care for this population. Moreover, in future, there is a need to explore epidemiologic factors, risk factors, and optimal treatment for this syndrome. It is also essential to consider the length of time from symptom onset to initial presentation as this is still unknown. The proportion of patients presenting with low back pain who demonstrate symptoms and signs consistent with piriformis syndrome is also unknown and merits further consideration. Our study was preliminary in nature. Therefore, a larger cross sectional study on nation level in order to explore the full impact of this syndrome is necessary.

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