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Original Article

Frequency of Piriformis Syndrome Among Female Physical Therapy Students of Gujranwala, Pakistan

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ABSTRACT

Piriformis Syndrome (PS) is a neuromuscular disorder that is caused when piriformis muscle compresses the sciatic nerve. Its prevalence is very high in sedentary population and young people have more risk factors of getting affected with piriformis tightness that causes PS and later on lower back pain. The incidence rate of PS among patients with lower back pain varies from 5% to 36%, prevalence with sciatic nerve is 17% and prevalence with common peroneal nerve is 81%. Its etiology can be primary or secondary. Primary will be anatomical variation and secondary will be due to any other causes (trauma or local ischemia). It is more common in females with ratio of 3 to 1 **Objective:** To determine the frequency of piriformis syndrome among the female physical therapy students of Gujranwala. **Methods:** It was a cross-sectional study conducted in physical therapy female students of different institutes of Gujranwala. Data was collected from 195 students with Convenient sampling technique. The Diagnostic tools used was Visual Analogue Scale Piriformis syndrome diagnostic criteria. **Results:** Out of 195 female physical therapy students 72 (36.9%) had a high score and had a high probability of having piriformis syndrome. Only (4) 2.1% were unlikely of having piriformis syndrome while in majority of the participants 119 (61%) piriformis syndrome was not considered. **Conclusions:** Female physical therapy students of Gujranwala have a low to moderate probability of having PS, with increased probability of buttock pain associated with prolonged sitting.

INTRODUCTION

Piriformis Syndrome (PS)is uncommon neuromuscular disorder that is caused when the Piriformis Muscle (PM) compresses the sciatic nerve [1]. Piriformis is a deep muscle in gluteal region, it is a small pyramidal shaped flat muscle and a part of lateral rotator, which originates from sacrum (lower spine) and inserts on to the greater trochanter of the femur. Spinal nerves L5 to S2 innervate the piriformis muscle. Piriformis muscle helps in external rotation, abduction of the hip joint and hip flexion during walking [2]. The major cause of PS is unwanted reciprocal inhibition from overactive hip flexion that is psoas major, iliacus and rectus femoris. This imbalance occurs when the hip flexors are trained to be tight and too short, such as when we sit with flexed hip, or sitting all day for work [3]. Hypertrophy, inflammation and anatomical variations of piriformis muscle can lead to this condition. Incidence for PS among patients with having low back pain varies from 5% to 36%. It's etiology can be primary and secondary. Primary will be due to anatomical variation and secondary will be due to any other cause e.g., trauma, local ischemia, limb length discrepancy [4]. Carrying wallet in pocket containing bills, cards and coins are the habit of men. When they sit having wallet in back pocket, they have increased chance of getting the nerves damaged that run in that part of lower back and lead to extreme pain. The other name of this syndrome is "fat wallet syndrome or wallet neuropathy". It involves both sciatic nerve and piriformis muscle as it is neuromuscular condition [5]. Short-term compensation in congenital leg length discrepancy causes PS. While standing, walking, running, the person with leg length discrepancy change posture. Compensatory posture affects the bone position where muscle inserts [6].

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Acute muscle damage can be caused by high radiotherapy. Radiotherapy in cervical cancer causes fat atrophy of muscle that results in PS [7]. Percutaneous endoscopic lumbar discectomy with high level of stress in local anesthesia elevate PS after walking rather than the patient with/without lower leg pain [8]. The prevalence of PS was statistically insignificant in males and females. Its prevalence is very high in sedentary population and young people have more chances of getting affected with tightness of piriformis muscle that causes PS and later on low back pain [9]. In Lasegue's sign, pain is localized to piriformis area while doing 90degrees hip and knee flexion and then extending knee while hip flexed [4]. There are some non- pharmacological interventions also applied such as osteopathic manipulative treatment and this can be used separately or with the combination of the pharmacotherapy options for the management of this syndrome [10].

Previous studies have discussed about the prevalence of PS but there is very little data available about females. As there is more prevalence of PS among female 3:1 ratio and there is no evidence of cross-sectional study on PS among females in Pakistan. The purpose of this study was to find out the frequency of PS among Female physical therapy students of Gujranwala. The outcome of this study will be helpful in giving awareness about postural training to minimize occurrence of PS. It was also educational survey to identify influence of prolong sitting among students. The ultimate goal is to rule out the predominance of PS among the female Physical therapy students of Gujranwala.

METHODS:

An observational cross-sectional study was conducted in Physical Therapy colleges of Gujranwala including Gujranwala Institute of Rehabilitation Sciences, Royal College, Islam Medical College, Ellite College. Sample size was taken as '195'. The sample size was selected through Raosoft Software from the total number of physical therapy students in Gujranwala. Convenience sampling was used. An informed consent was taken from students by telling the aims and objectives of the study. The students were selected on the basis of convenient sampling technique. Firstly, questionnaire recorded the demographic information such as age gender and profession. Piriformis Syndrome Diagnostic Criteria was used to assess the prevalence of piriformis syndrome among the female physical therapy students. A score of 8 to10 is considered probable. If the score is less than 8 or greater than 6, it is considered unlikely. A score less than 6 is not considered [11].

Data Collection Procedure:

It was a cross-sectional study, performed in 6 months. Sample size of 195 students was taken. The data was collected from female Pysical Therapy students of different Physical Therapy Institutes of Gujranwala. Convenient sampling technique was used. Visual Analogue Scale (VAS) and Piriformis Syndrome Diagnostic Criteria was used. Consent form was signed from each individual before collection of data. All ethical considerations were taken during data collection. Inclusion Criteria was age 18-25 years, only female participants, Physical therapy students and exclusion criteria was Leg length discrepancy, History of any recent trauma or tumor. Piriformis muscle syndrome diagnostic criteria, VAS was used.

Statistical Analysis

Data was analyzed using SPSS version 21. Frequency and Percentage tables and Bar Charts were used for Quantitative Variables. Pie Charts were used for Qualitative variables.

RESULTS:

Table 1 shows that out of 195 female physical therapy students, 68 (34.9%) claimed to have unilateral or bilateral buttock pain,63 % of total students showed 0 scoring for no lower back pain and 36.9% had score 1, 141 (72.3%) students showed negative lasegue's maneuver, while 138 (70.8%) triggered buttock pain with prolonged sitting, 76 (39%) had sciatic pain with painless time periods throughout the day, 80 (41%) subjects complained of pain with stretching. According to this table Gujranwala institute of rehabilitation sciences have highest percentage of students who participate in this research that is 59 %. The sum of total scores of all questionnaires is 195, in which minimum scoring is 4 and maximum is 10 among all students with mean and standard deviation of 6.04±2.590 (Table 2). Frequencies and percentages of all the subjects according to scores of PS Diagnostic Criteria are shown in Table 3.

Participating Colleges	Frequency	Percentage
Gujranwala institute of rehabilitation sciences	115	59.0
Royal college	22	11.3
M. Islam college	10	5.1
Elite college	48	24.6
Total	195	100.0

Table 1: Frequency of number of students from each institute

	N	Minimum	Maximum	Mean	SD
Total Sum of Score	195	4	10	6.04	2.590
N (listwise)	195				

Table 2: Frequency of scoring among the students

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No.	Diagnostic Criteria of Piriformis Syndrome	Frequency		Percentage	
1	Unilateral or bilateral buttock pain with fluctuating periods without pain throughout the course of the day	0	1	0	1
		127	68	65.1%	34.9%
2	No lower back pain	0	1	0	1
		123	72	63.1%	36.9%
3	Axial spinal palpation painless (L2 to S1)	0	1	0	1
		38	157	19.5%	80.5%
4	Negative Lasegue's maneuver	0	1	0	1
		54	141	27.7%	72.3%
5	Seated position (often for a prolonged period) triggering buttock pain and/or sciatic pain	0	1	0	1
		57	138	29.2%	70.8%
6	Sciatic pain with fluctuating periods without pain throughout the course of the day	0	1	0	1
		119	76	61.0%	39.0%
7	Buttock pain next to the projection of the piriformis muscle reproduced by Stretching maneuvers (FAIR, Freiberg, HCLK)	0	1	0	1
		123	72	63.1%	36.9%
8	Contraction resisted maneuvers (Beatty)	0	1	0	1
		160	35	82.1%	17.9%
9	Palpation	0	1	0	1
		148	47	75.9%	24.1%
10	Sciatic pain (L5, S1 or truncal sciatic area) reproduced by the extension of clinical maneuvers (several tens of seconds)	0	1	0	1
		138	57	70.8%	29.2%
11	Stretching	0	1	0	1
		115	80	59.0%	41.0%
12	Resisted contraction	0	1	0	1
		130	65	66.7%	33.3%
13	Absence of perineal irradiation	0	1	0	1
		25	170	12.8%	87.2%

Table 3: Frequency and Percentage of Subjects with scores on the Piriformis Syndrome Diagnostic Criteria

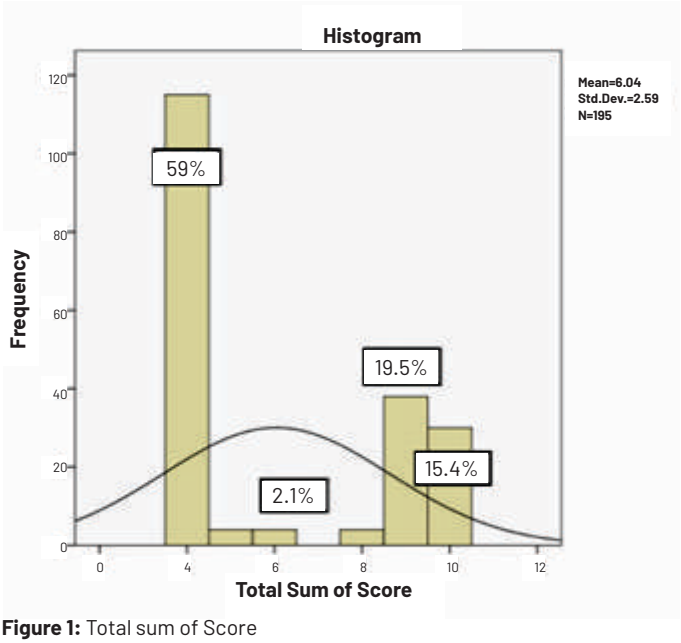

Figure 1: Total sum of Score

The maximum frequency (59.0%) of students with score 4, (2.1%) with score 6, (19.5%) with score 9 and (15.4%) with score 10 (Figure 1). Figure 2 shows that 119 (61.0%) students are not considered for PS, 72 (36.9%) have probably PS and 4 (2.1%) are unlikely diagnosed as PS.

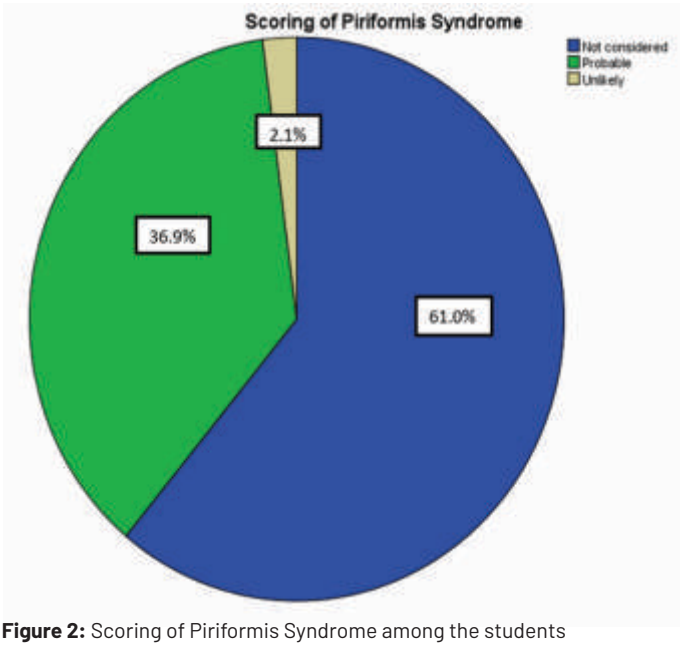

Figure 2: Scoring of Piriformis Syndrome among the students

DISCUSSION:

In a study, 6% patients with low back pain had PS while this study showed that 36% of students had low back pain [4]. In our research 36 % students have pain reproduced by stretching maneuvers. Recent studies [9] suggested that Piriformis muscle consists of type-I fibers and has a great ability to develop tightness when the prolong stress is applied to this muscle. Due to shortness of piriformis muscle, it creates pressure to the sciatic nerve which passes under it in 80% of population. While in our research 70.8% students presented with sciatic nerve compression with prolong sitting due to shortened piriformis muscle. A previous study suggested that PS ratio for male and female is 6:1 while in our study ratio is 3:1 among females of PS [12]. Another study concluded that females are more likely to affect with PS than males [13]. PS is a painful condition which may misdiagnosed as chronic buttock and low back pain. Modified FAIR test is used for the piriformis syndrome diagnosis [14]. Treatment decisions in a study proved effective in 8/8 patients with primary and in 9/13 patients with secondary PMs [15].

In another study, 30 female subjects divided in to two groups group A receiving MET and group B receiving static stretching. Treatment duration was 10-15 min/ session for 7session/week for two weeks. This study revealed that MET along with short wave diathermy is more effective than stretching with short wave diathermy [16]. Dry needling plus conventional physical therapy was found to be superior with immediate effect to reduce pain and increase internal rotation range in a study [17]. Findings of a study conducted in US showed that only 72 percent knew about the term PS others didn't acknowledged its existence. Furthermore, 55%

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thought the disease was over-diagnosed, while 38% said it was under-diagnosed [18]. the prevalence and risk factor of piriformis syndrome also depends on the daily life habits such as wallet in the back pocket which increases the risk factor for Piriform syndrome in the taxi driver [19].

Approximately two Million Americans have wallet neuritis associated with Piriformis syndrome [20]. A significant improvement in the pain and functional status with combination of neural mobilization and strengthening exercise was observed in another study [21]. Overuse of the piriformis muscle, such as in long-distance walking or running, or direct compression can cause micro trauma. Because the piriformis muscle is strained throughout the gait cycle, it is thought to be more prone to hypertrophy than other muscles in the region. Gait abnormalities can emerge as a result of greater internal rotation and adduction, such as when a leg length difference is present [22].

CONCLUSION:

This study concludes that female physical therapy students of Gujranwala have a low to moderate probability of having piriformis syndrome, most of the participants that showed probability of piriformis syndrome involved buttock pain that triggered with prolonged sitting.

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