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Original Article

Prevalence of Piriformis Tightness in Sciatic Patients

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ABSTRACT

Piriformis muscle is supplied by sciatic nerve and its origin is from sacrum through first to fourth sacral foramina, from the edge of greater sciatic foramen and from pelvic surface of the sacrotuberous ligament. **Objective: T**o calculate the prevalence of piriformis muscle tightness in sciatic patients. **Methods**: This cross-sectional study was conducted in Gujranwala and physical examination of piriformis tightness in sciatic patients involved piriformis stretch test. Demographic data, Semi-structured questionnaire, and consent form were used to collect data. All data was analyzed by Statistical Package for Social Sciences (SPSS) version 21.0. Sample size for this study was 251. T-test was used for quantitative data and *Chi square* for qualitative data. P ≤ 0.05 was considered as significant value. All the results were calculated at 95% confidence level. **Results:** Prevalence of piriformis muscle tightness in sciatic patients is high. Results shows that total 251 sample size, 181(72.1%) patients tested positive for Piriformis stretch test while 70(27.9%) tested negative for piriformis stretch test. **Conclusion:** Piriformis stretch test was statistically significant and resulted positive in most of the cases.

INTRODUCTION

Piriformis muscle is supplied by sciatic nerve and its origin is from sacrum through first to fourth sacral foramina, from the edge of greater sciatic foramen and from pelvic surface of the sacrotuberous ligament [1]. Sciatic pain is aching and sharp and if there is compression on S1 then pain is felt posteriorly and if compression is present on L5 then pain will be felt dorsolateral but always it comes from middle or lower buttock. Sciatic pain and piriformis muscle are interrelated to each other but this is not a new discovery [2]. LBP and buttock pain having sciatica can be caused by Piriformis syndrome (PS). PS come under differential diagnosis if pain is in low back/buttock and radiating down the back of leg [3]. There is no significant relation between chair height, chair weight and cushion support with piriformis tightness in case of prevalence of piriformis tightness in bankers and people with high BMI and in fourth decade of life and in such cases, Pain is aggravated by sitting position and released by rest [4]. Piriformis tightness is just the shortening of muscle length may be due to sedentary lifestyle whereas PS is neuritis of sciatic nerve which happens due to injury of piriformis muscle but sometimes they both gets confused with each other [5]. Sciatica is a symptom not a disease and it is rarely caused by primary neuritis and due to disease of piriformis muscle that is type of leg pain becomes the reason for unusual disorder of piriformis muscle or due to any traumatic injury. Sciatica show piriformis like symptoms is still vague [6]. Risk factors of PS and chances of getting this is depends upon the risk factors of work duration. In case of online taxi driver, the big risk factor that associates with getting of PS is the habit of putting wallet in the back pocket [7]. Piriformis is one of the main muscles around the hip joint which gets shorten in prolonged sitting duration work of desk job people due to limited flexibility. Piriformis muscle is abductor, extensor and external rotator of hip joint [8]. Wherever the compression is present sideways to the near

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of nerve supplying the piriformis muscle but the symptoms of pain scattering will remain the same [9]. Current study was planned to calculate the prevalence of piriformis muscle tightness in sciatic patients. To provide the information that how much piriformis tightness caused by sciatica so in the future to control the tightness of piriformis muscle and to improve prognosis in sciatic patients. To help the physiotherapists in protecting the muscle tightness in sciatic patient. According to stated life time prevalence of low back pain and sciatica which is defined as pain or numbness in the buttock and at the backside of thigh area infrequent radiations towards the feet are common symptoms is as high as 60% to 90% [14]. Many studies stated this that everywhere 0.3% to 6% of people who had pain in lower back area and leg pain named sciatica have any connection with disease of piriformis muscle [15]. Around 15% of the time, the muscular anatomy neighboring the crossing of the sciatic nerve and the piriformis muscle is strange and about 30% of the time, the lumbosacral plexus that build up the sciatic nerve do not join proximal to the sciatic nerve [16]. In 17% of population, the connection between sciatic nerve and piriformis muscle is present. Almost six kinds are defined here but not any kind is match to our description [17]. Risk factors of PS and chances of getting this is depends upon the risk factors of work duration. In case of online taxi driver, the big risk factor that associates with getting of PS is the habit of putting wallet in the back pocket [18]. Some job holders on long sitting chairs are more prone to develop tightness of PS like tech professionals, call center employees, government officials, motor vehicle drivers etc. In sedentary people, frequency of stiffness in muscle named piriformis was present with high percentage [19]. It is ignored by the practitioner due to patient's misunderstanding and overlying symptoms with other lower leg diseases. 6-7% of people with low back pain show positive symptoms for piriformis syndrome [20]. To tell people that too much time seated position should be avoided and walking after twenty minutes is good. During driving we should stop the car for standing and do stretching for sometimes. Gluteus area should be saved from lesions. To increase the knowledge that Piriformis stiffness can occur again so stretching on daily basis can avoid this.

METHODS

This Cross-sectional study was conducted in two settings of Gujranwala, Allama Iqbal memorial hospital and Med care Hospital. Semi-structured questionnaire along with consent form was used to collect data. 251 participants included who were diagnosed with sciatica [3], having age between 25 to 55 years and those who had reported cases OA of spine or hip [1]. Females with pregnancy [10], stroke [1], Any congenital deformity of Lower Limb (Perth's disease, DDH.) [11]. Recent Surgeries of lower limb and spine (fractures of femur or tibia, Foraminotomy, and Nucleoplasty, also called plasma disc compression or osteotomy) [5] were excluded from this study. Data was collected by demographic data, semi structured questionnaire, Piriformis stretch Test. All data was taken from Sciatic Patients. The age, gender and marital status of participants were present. T-test was used for quantitative data and Chi square for qualitative data. Piriformis stretch test was performed when the patient's position was supine, the leg which needed to be checked was moved by flexing it at the acetabular joint and knee joint (there was crossing of one leg on the other leg) other leg was straight. Hip joint was in flexion maintained at 60 degrees. One hand of the therapist was placed on the anterior superior iliac spine for stabilization and was standing at that side which needed to be tested. By moving the knee into adduction, a stretch was created on the piriformis muscle. If the muscle was tight then patients complained unpleasant feeling at the greater trochanter and test was thought to be positive.

RESULTS

Results have been obtained by analyzing the data collected from 251 sciatic patients. Questionnaire and Piriformis stretch test was used to collect the data and association between different variables was found by performing statistical analysis. It indicates that the prevalence rate of piriformis tightness is quite prominent in sciatic patients showing a higher probability of unfavorable consequences. Out of total 251 sample size, 181(72.1%) patients tested positive for Piriformis stretch test while 70(27.9%) tested negative for piriformis stretch test with P- value <0.001 which is statistically significant. Table 1 shows the demographic characteristics such as age, gender and marital status among total population. Table 2 shows the diagnostic test which has been categorized into two categories, positive and negative. Out of total 251 sample size, 181(72.1%) patients tested positive for Piriformis stretch test while 70(27.9%) tested negative for piriformis stretch test.

Variables	Categories	n (%)
Age (years)	25-30	79(31.5)
	31-35	56(22.3)
	36-40	47(18.7)
	41-45	20(8.0)
	46-50	22(8.8)
	51-55	27(10.8)
Gender	Male	133(53)
	Female	118(47.0)
Marital status	Married	201(80.08)
	Unmarried	50(19.92)
Total		**251(100)**

Table 1: Demographics of studies population

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Diagnostic Tests	Variables	n(%)	Chi square value	P- Value
Piriformis Stretch Test	Positive	181(72.1)	49.088	<0.001*
	Negative	70(27.9)		
Total			251(100)	

Table 2: Diagnostic tests for Piriformis syndrome

Variables	Chi-square Value	Spearman correlation	p-value
Age (years)	12.672	0.107	0.027*
Gender	4.974	-0.141	0.026*
Occupation	8.382	-0.112	0.136*
Marital Status	4.388	-0.132	0.036*

Table 3: Association of Piriformis stretch test with demographic characteristics

Table 3 shows the association of piriformis stretch test with demographic characteristics. Association between piriformis stretch test and Age (years) was found to be statistically significant with p-value= 0.027*, association between piriformis stretch test and Gender was found to be statistical significant with p-value= 0.026*, association between piriformis stretch test and Occupation was not found to be statistical significant with P-value = 0.136* and association between piriformis stretch test and Marital status was found to be statistical significant with p-value= 0.036*.

Prevalence of Piriformis tightness	Variables	n (%)	Chi-Square Value	P-Value
Level of discomfort at hip region	Yes No	232(92.4) 19(7.6)	180.753	<0.001*
Use of stairs in daily routine	Yes No	183(72.9) 68(27.1)	52.889	<0.001*
Discomfort t hip area while lifting object from floor	Yes No	224(89.2) 27(10.8)	154.618	<0.001*
Discomfort while sleeping	Yes No	139(55.4) 112(44.6)	2.904	0.088*
Discomfort while sitting on hard surface	Yes No	208(82.9) 43(17.1)	108.466	<0.001*
Perform ADLs without any restrictions	Yes No	90(35.9) 161(64.1)	20.084	<0.001*
Drive easily without any discomfort	Yes No	94(37.5) 157(62.5)	15.813	<0.001*
Perform exercise daily	Yes No	57(22.7) 194(77.3)	74.777	<0.001*

Table 4: Prevalence of Piriformis Tightness

Table 4 shows the questions of questionnaire which has been categorized into two categories, yes or no. Out of total 251 sample size, 232(92.4%) patients having discomfort at hip region while 19(7.6%) did not have discomfort at hip region, 183(72.9%) patients use stairs in daily routine while 68(27.1%) did not use stairs in daily routine, 224(89.2%) patients had discomfort at hip area when lifting object from floor while 27(10.8%) had no discomfort at hip area when lifting object from floor, 139(55.4%) patients had discomfort while sleeping whereas 112(44.6%) had no discomfort while sleeping, 208(82.9%) patients had discomfort while sitting on hard surface whereas 43(17.1%) had no discomfort while sitting on hard surface, 90(35.9%) patients perform ADLs without any restriction whereas 161(64.1%) cannot perform ADLs without any restriction, 94(37.5%) can drive easily without any discomfort whereas 167(62.5%) cannot can drive easily without any discomfort and 57(22.7%) perform exercise daily while 194(77.3%) do not perform exercise daily.

DISCUSSION

In previous study, a total of two hundred sedentary healthy individuals were studied and amongst them one hundred and fifty-nine subjects were known as having tightness in piriformis muscle, the frequency of piriformis muscle tightness thus present was 79.5% [1]. The results of current study show that out of all 251 patients, the prevalence of piriformis muscle tightness is 181(72.1%) and 70 (27.9%) patients had no tightness. A previous study that was conducted in India, in which prevalence of piriformis muscle tightness in bankers is 51.92% and out of all 260 participants 135 participants had piriformis muscle tightness [4]. According to current study 181 subjects with percentage of 72.1% had piriformis muscle tightness while 70 subjects (27.9%) had no tightness of piriformis muscle from the total of 251 subjects. In our current study, 251 patients reported with sciatica were included, out of total 251 sample size, 181 (72.1%) patients tested positive for Piriformis stretch test while 70 (27.9%) tested negative for piriformis stretch test. Another study conducted in Faisalabad city supports our study, out of 190 subjects, 125 participants with percentage of 65.4% tested positive for piriformis stretch test means they had tightness of piriformis muscle while 65 participants (34%) tested negative for piriformis stretch test and did not have tightness of piriformis muscle [12]. In yet another study, 93 subjects with chronic low back pain were enrolled that was caused by so many different reasons. Among these participants, 16 patients (17.2%) had tightness in piriformis muscle and out of which 82.8% patients presented with sciatica also [13]. On comparing this study with current study with a sample population of 251 sciatic patients, the prevalence of piriformis muscle tightness is 72.1% having 181 participants while 70 subjects (27.9%) had no tightness of piriformis muscle from the total of 251 subjects. Piriformis muscle tightness is common in different populations and so many studies conducted on this issue. Recently a study revealed that the prevalence of piriformis muscle tightness in middle aged men with age range between 36-46 years, out of all 120 subjects is 38 (31.75%) [11]. Our study supports these previous results as out of total 251 subjects, 65(82.3%) were in the range between 25-30 years, 40 (71.4) in the range between 31-35 years, 26(55.3%) in the range between 36-40 years, 14(70.0%) in the range between 41-45 years, 14(63.6%) in the range between 46-50 years and 22(81.5%) in the range between 51-55 years had piriformis muscle tightness. In a study 2910 cases from outpatient department (OPD) were reported with lower backache or hip pain with sciatica and among all

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of those cases 182 participants (6.25%) had tightness in piriformis muscle tested with stretch tests for piriformis muscle [3]. Whereas in current study 251 participants were taken who were reported with sciatica and among all of these 251 cases reported with sciatica 181 patients had tightness in piriformis muscle confirmed with piriformis muscle stretch test and on the other hand 70 participants (27.9%) had no tightness in piriformis muscle on performing piriformis muscle stretch test. Limitation of the study is that the strength of Gluteus Medius muscle was not measured and BMI was not noted which may lead to piriformis tightness. It is recommended that further study should focus on specific population and it should be done to find out the association. 3

CONCLUSIONS

This study was conducted to analyze the prevalence of piriformis tightness in sciatic patients. It indicates that the prevalence rate of piriformis tightness is quite high in sciatic patients. This study shows that the ratio of males and females suffering from piriformis tightness was almost equal. Most of the patients affected with piriformis tightness were married. Government job holders and house wives were mostly affected with tightness. Therefore, rest is important for patients for making accurate health decisions in such critical aspect of life.

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