Original Article

STUDY OF TREATMENT OUTCOME OF PIRIFORMIS SYNDROME WITH AND WITHOUT PHYSIOTHERAPY TREATMENT

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Abstract

The purpose of this Study is to: Compare the effectiveness of Medicine, Physiotherapy and their combination in the management of Piriformis Syndrome (PS).

Methodology: This interventional study was conducted at the Department of Physiotherapy and Orthopedics Unit I, King Edward Medical University/ Mayo Hospital Lahore. A total number of 50 people were taken in this study. The subjects were divided into 3 groups. In the first group 14 subjects were included, in the second group 20 subjects were included and the third group 16 subjects were taken. **Group I:** In this group patients were taken with using medicine only and was taken from OPD department unit I, Mayo Hospital Lahore. **Group II:** In this group those patients were included who were already taking medicine and were also referred to get Physiotherapy treatment. **Group III:** In this group those patients were included who were taking only Physiotherapy treatment. These were taken from Physiotherapy Department, Mayo Hospital Lahore. Informed consent was taken from the patients or attendants. Patients included in the group who were taking only medicine were interviewed by direct and indirect method and were followed after every week about their conditions by phone or email, and were requested for reassessment after every two months up to six months.

Results: The mean age of all patients was 46.26 ± 8.25 years. In this study flexion before the treatment and when measured at different intervals after the start of the treatment, it was different for all the treatment options which were used for patients and in the treatment group in which patient was given medical and physiotherapy flexion was quite improved as compared to other treatment groups. i.e. (p-value = 0.001). Lateral rotation before the treatment and when measured at different intervals after the start of the treatment it was different for all the treatment options which were used for patients and in treatment group in which patient was given medical and physiotherapy was quite improved as compared to other treatment groups. i.e. (p-value = 0.002). When patients were tested for Piri-

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formis. The pain level of patients in group II was significantly improved on (VAS). On follow-up it was seen that the patients with combined treatment groups were recovered significantly as compared to other groups.

Conclusions: Based on the results of statistical data analysis, it is concluded that the prognosis of the disease is best in the group of patients whom both the physical and medical treatment were given, rather than the other two groups whom only physical or only medical treatment was given. It justifies the hypothesis of this study report that "The combination of Physiotherapy and Medicine is a better management for the treatment of Piriformis Syndrome".

Key words: Piriformis Syndrome, Physical Therapy.

Introduction

Piriformis syndrome is an elusive clinical entity. It is characterized by buttock pain with a variable component of sciatic nerve irritation and probably represents the most common cause of extra spinal sciatica.[1]

The Literature reported that at least 6% of patients actually Suffered with Piriformis syndrome who are initially diagnosed with Low Back Pain.[2-4]

A large scale formal prospective outcome trial using Class A study, designed as outlined by the American College of Physicians, found that the weight of the evidence – based medicine is that Piriformis Syndrome should be considered as a possible diagnosis when sciatica occurs without a clear spinal cause.[5,6]

Sciatic nerve passes through the Piriformis muscle in 15 – 30% population rather than underneath it.[7] According to some studies, such people have greater possibilities of Piriformis Syndrome than the general population.[8]

People can suffer with Piriformis syndrome due to the entrapment of the sciatic nerve after it exits the greater sciatic notch in gluteal region.[9,10] Normally sciatic nerve have two variations in the gluteal region. sciatic nerve lies inferior to the Piriformis muscle and superior to the Gemellus Superior muscle in one of the variations.[7] Sciatic Nerve usually suffered with entrapment in this area, possibly because of Myospasm or contracture of any of these muscles.[11]

The second cause of entrapment may be when the sciatic nerve or any of the branches of the sciatic nerve passes through the Piriformis muscle. The Possibility of this variation is 1 – 5%.[12,13]

Some studies rate the occurrence of Piriformis Syndrome from 5% to 36%.[2,3,14] Among the patients having Low Back Pain.

Usually the people during the fourth and fifth decades of their life have great chances of suffering with Ps and the individuals of all occupations and activity levels can be the victims.[15,16] One study reported that documented incidence of PS is 6% high in females as compare to males.[2]

Some Clinicians treat Piriformis Syndrome with injections having local anesthetic and steroid or botulinum toxin. The use of dilute local anesthetic and steroid in the region of the sciatic nerve have also been reported by some researchers. The injections were applied blindly in older technique, while in latest techniques muscle electromyography or computed tomography (CT) is used to locate the piriformis muscle and nerve stimulator to locate the sciatic nerve.[10,12] In cases when there is entrapment of sciatic nerve in Piriformis Muscle, surgical intervention is done as treatment of choice so that the muscle can be thinned, removed or divided. In such cases Obturator internus, gemelli, and quadratus femoris muscles start doing the function of piriformis muscle as all these muscles have same insertion.[10,11]

In Physiotherapy treatment Piriformis Muscle can be relaxed by advising the patient lie down with the knee of the affected side bent. The patient is instructed to pull the knee of the affected side across the body toward the chest of opposite side. Patients are advised to hold the position for 5 seconds and gradually hold it up to 60 – second.[11] This position rotates the hip inward and relaxes the piriformis muscle of that side. Initially, this Patient are guided to perform this exercise every 2 hours.[11]

Another exercise is performed to relax the hamstring muscles in the back of the thigh. Because the spasm in piriformis muscle causes the tightness in hamstrings, and this increase the pressure on the sciatic nerve. The patient is asked to lie on his/her back and keep the leg of normal side straight and flat than the affected leg is taken straight upward and this position is maintained for 10 seconds to stretch the hamstring muscles.[17]

Materials and Methods

Longitudinal interventional study design was used and study was conducted at the Department of Physiotherapy and Orthopedics Unit I, King Edward Medical University / Mayo Hospital Lahore. Study was completed in six months after the approval of synopsis.

A total number of 50 people were taken in this study. The sample size had been calculated by using the 6% prevalence of PS, 5% level of significance. 6% level of precession.

The subjects were divided into 3 groups at convenient basis. In the first group 14 subjects were contained, in the second group 20 subjects were included and the third group contained 16 subjects.

Group I: In this group patients were taken with using medicine only. This group was taken from Out Patient Door, Mayo Hospital Lahore.

Group II: In this group those patients were included who were already taking medicine and were referred to get Physiotherapy treatment along with current treatment.

Group III: In this group those patients were included who were taking only Physiotherapy treatment. These were taken from Physiotherapy Department, Mayo Hospital Lahore.

Sampling Technique and Sample Selection Criterea

Randomized sampling technique was used to get the data.

Inclusion Criteria

1. All patients having age 40 years or more than 40 years.
2. Patients of each gender.
3. Patients already diagnosed with Piriformis Syndrome.

Exclusion Criteria

1. Patients having other orthopedic disease like knee pain, disc pain, lumbago and sacroiliac pain.
2. Patients having traumatic injuries.

Methodology

Informed consent was taken from the patients or attendants. Patients included in the group who are taking only medicine were interviewed by direct and indirect method and were followed after every week about their conditions by phone or email, and were requested for reassessment after every two months up to six months.

The patients who were selected for Physiotherapy were received in Physiotherapy Department Mayo Hospital Lahore. The patients were requested to lie prone on five feet high wooden couch. Ultra Sound treatment was given with the machine having following specification;

Power Supply	AC 110 – 220 V
Power Consumption	65-95 VA + 15%(AC adaptor), 35VA + 15% (Battery)
Output Power	8.0W MAX
Ultrasound Frequency	800 KHz

Transmission gel was applied and Ultra sound machine was adjusted at the following specifications;

Coupling	Aqua gel
Intensity	0.5 to 1.00 W/cm^2
Output mode	70%
Duration	8 – 12 minutes

After Ultra Sound treatment the patient were asked to lie supine. Then Piriformis muscle was stretched. The patient was asked to touch the knee to the opposite side of chest while his leg was rotated out ward to give maximum stretch to Piriformis muscle. This position was held for 15 seconds and then the patient was instructed to relax the leg. This exercise was repeated for 10 times in one treatment session. Patient was given treatment on daily basis for four weeks. The patient was followed by phone for six months to checks the recurrence of symptoms.

Follow-up

The patients were treated maximum for 6 weeks according to their requirements and were followed for six months to check the recurrence of symptoms.

Results

Descriptive Statistics for Age (Years), Weight (Kg), Height (H)

			N	Mean	SD	Maximum	Minimum	p-value
Age	Treatment	Medical	14	45.92	8.23	41.00	65.00	0.778
		Medical and PT	20	47.25	9.06	41.00	67.00	
		PT	16	45.31	7.56	40.00	59.00	
Total			50	46.26	8.25	40.00	67.00	
Weight	Treatment	Medical	14	73.89	14.95	52.00	110.00	0.503
		Medical and PT	20	73.40	9.68	56.00	90.00	
		PT	16	77.56	8.66	63.00	97.00	
Total			50	74.87	11.05	52.00	110.00	
Height	Treatment	Medical	14	5.54	.22	5.10	5.90	0.711
		Medical and PT	20	5.64	.52	5.10	7.00	
		PT	16	5.58	.15	5.30	5.90	
Total			50	5.59	.35	5.10	7.00	

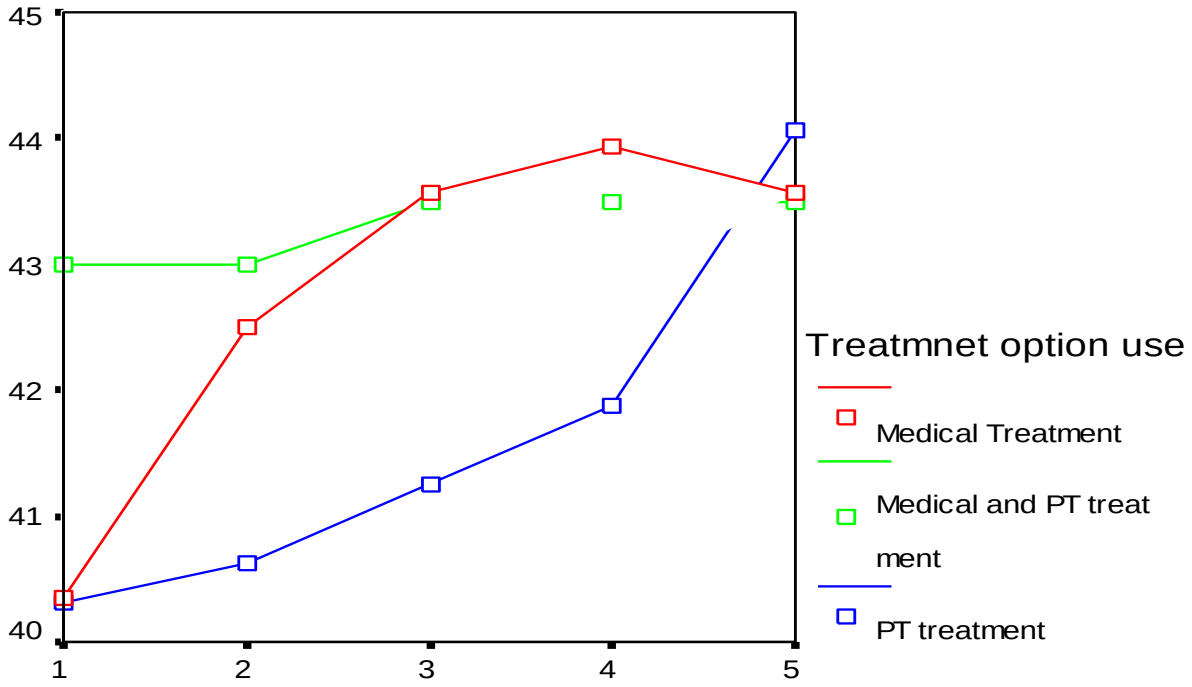
The mean age of patients who were given medical treatment only was 45.92 ± 8.23 years. The minimum age in this group was 41 years and maximum age was 65 years. Patients who were given combination treatment (Medical and Physiotherapy) their mean age was 47.25 ± 9.06 years. The minimum age in this group was 41 years and maximum age was 67 years. Third group in which patients were given only phyisotherapy treatment their mean age was 45.31 ± 7.56 years. The minimum age in this group was 40 years and maximum age was 59 years. P-value = 0.778 showing that age was same in all three treatment group. Similarly weight and height for all the patients in all three treatment groups was same i.e. p-value (Weight) = 0.503 and p-value (Height) = 0.711.

Follow up for Abduction with respect to Treatment option used

Treatment option used		Mean	Std. Deviation	N
Abduction before treatment	Medical Treatment	40.35	6.344	14
	Medical and PT treatment	43.00	2.51	20
	PT treatment	40.31	5.31	16
	Total	41.40	4.84	50
Abduction after 1 week	Medical Treatment	42.50	4.27	14
	Medical and PT treatment	43.00	2.51	20
	PT treatment	40.62	5.12	16
	Total	42.10	4.05	50
Abduction after 2 week	Medical Treatment	43.57	2.34	14
	Medical and PT treatment	43.50	2.35	20

Treatment option used		Mean	Std. Deviation	N
	PT treatment	41.25	4.28	16
	Total	42.80	3.21	50
Abduction after 4 week	Medical Treatment	43.92	2.12	14
	Medical and PT treatment	43.50	2.35	20
	PT treatment	41.87	3.09	16
	Total	43.10	2.65	50
Abduction after 6 week	Medical Treatment	43.57	2.34	14
	Medical and PT treatment	43.50	2.35	20
	PT treatment	44.06	10.03	16
	Total	43.70	5.87	50

Treatment option used (p-value) = 0.331



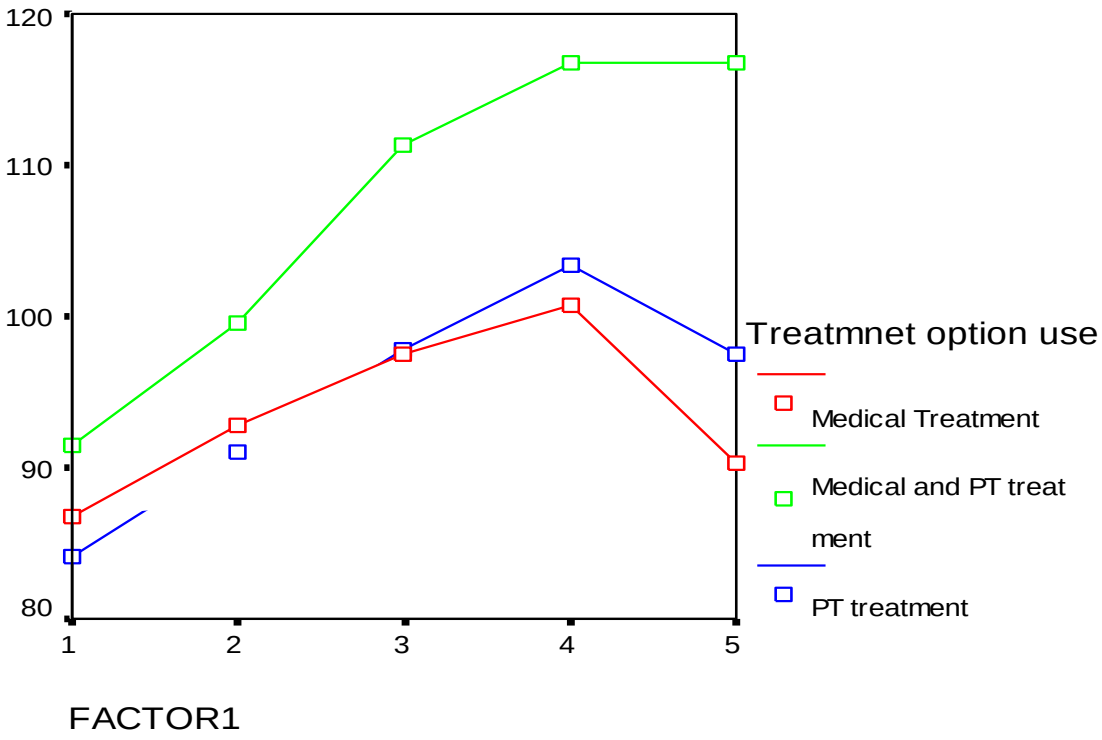
(Figure X) Abduction was same when measured on different intervals i.e. (p-value = 0.592).

Follow-up for Flexion with respect to Treatment option used

Treatment Option Used		Mean	Std. Deviation	N
Flexion before treatment	Medical Treatment	86.78	12.65	14
	Medical and PT treatment	91.50	9.88	20
	PT treatment	84.06	12.00	16
	Total	87.80	11.61	50

Treatment Option Used		Mean	Std. Deviation	N
Flexion after 1 week	Medical Treatment	92.85	13.96	14
	Medical and PT treatment	99.60	11.05	20
	PT treatment	90.99	13.19	16
	Total	94.95	12.94	50
Flexion after 2 week	Medical Treatment	97.50	15.90	14
	Medical and PT treatment	111.25	10.74	20
	PT treatment	97.81	13.41	16
	Total	103.10	14.56	50
Flexion after 4 week	Medical Treatment	100.71	16.62	14
	Medical and PT treatment	116.75	10.03	20
	PT treatment	103.43	12.47	16
	Total	108.00	14.60	50
Flexion after 6 week	Medical Treatment	90.35	27.97	14
	Medical and PT treatment	116.75	10.03	20
	PT treatment	97.50	24.96	16
	Total	103.20	23.878	50

Treatment option used (p-value) = 0.001

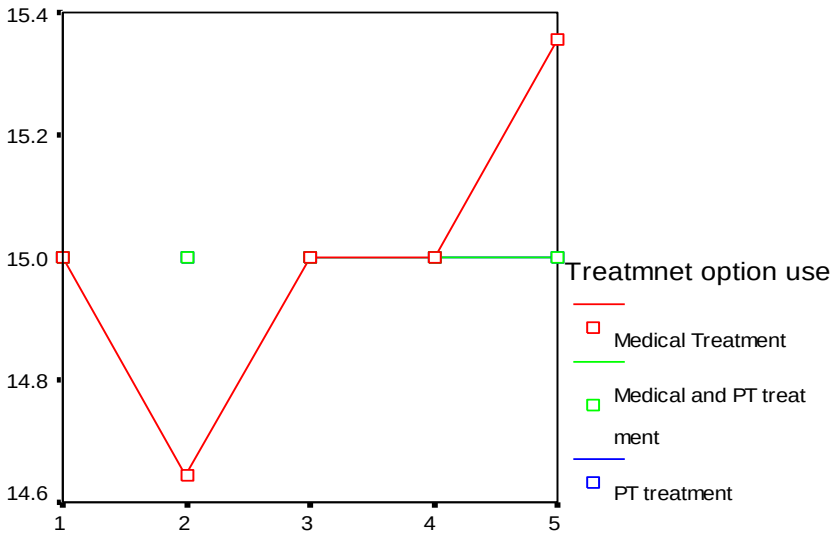


(Figure XI) Flexion was different when measured on different intervals i.e. (p-value=0.001).

Follow up for Extension with respect to Treatment option used

Treatment Option Used		Mean	Std. Deviation	N
Extension before treatment	Medical Treatment	15.00	.00	14
	Medical and PT treatment	15.00	.00	20
	PT treatment	15.00	.00	16
	Total	15.00	.00	50
Extension after 1 week	Medical Treatment	14.64	1.33	14
	Medical and PT treatment	15.00	.00	20
	PT treatment	15.00	.00	16
	Total	14.90	.70	50
Extension after 2 week	Medical Treatment	15.00	.00	14
	Medical and PT treatment	15.00	.00	20
	PT treatment	15.00	.00	16
	Total	15.00	.00	50
Extension after 4 week	Medical Treatment	15.00	.00	14
	Medical and PT treatment	15.00	.00	20
	PT treatment	15.00	.00	16
	Total	15.00	.00	50
Extension after 6 week	Medical Treatment	15.35	4.58	14
	Medical and PT treatment	15.00	.00	20
	PT treatment	15.00	.00	16
	Total	15.10	2.36	50

Treatment Option Used (p-value) = 0.592
Treatment Option Used Vs Extension (p-value) = 0.76

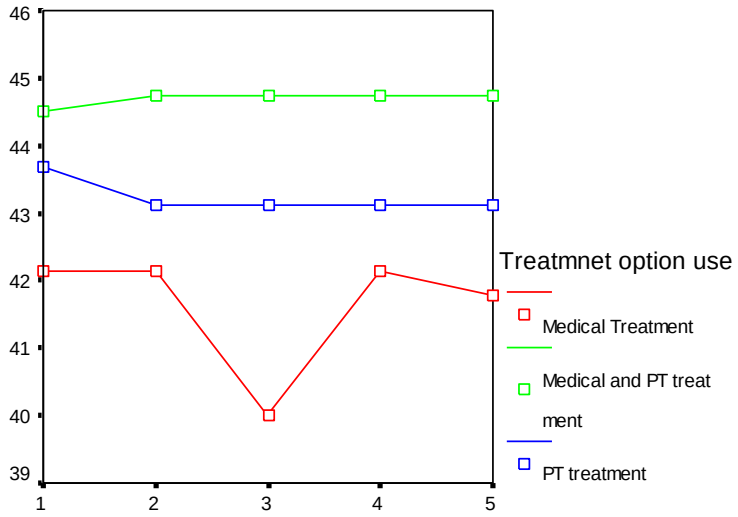


(Figure XII) Extension was same when measured on different intervals i.e. (p-value = 0.592). Extension was when compared with treatment options used it turns out to be insignificant (p-value = 0.765) i.e. Extension was same in treatment options used for the patients.

Follow up for Medial Rotation with respect to Treatment option used

Treatment Option Used		Mean	Std. Deviation	N
Medial Rotation before treatment	Medical Treatment	42.14	4.25	14
	Medical and PT treatment	44.50	1.53	20
	PT treatment	43.68	3.68	16
	Total	43.58	3.28	50
Medial Rotation after 1 week	Medical Treatment	42.14	4.25	14
	Medical and PT treatment	44.75	1.11	20
	PT treatment	43.12	2.50	16
	Total	43.50	2.90	50
Medial Rotation after 2 weeks	Medical Treatment	40.00	8.32	14
	Medical and PT treatment	44.75	1.11	20
	PT treatment	43.12	2.50	16
	Total	42.90	4.95	50
Medial Rotation after 4 weeks	Medical Treatment	42.14	4.25	14
	Medical and PT treatment	44.75	1.11	20
	PT treatment	43.12	2.50	16
	Total	43.50	2.90	50
Medial Rotation after 6 weeks	Medical Treatment	41.78	4.20	14
	Medical and PT treatment	44.75	1.11	20
	PT treatment	43.12	2.50	16
	Total	43.40	2.93	50

Treatment Option Used (p-value) =0.339



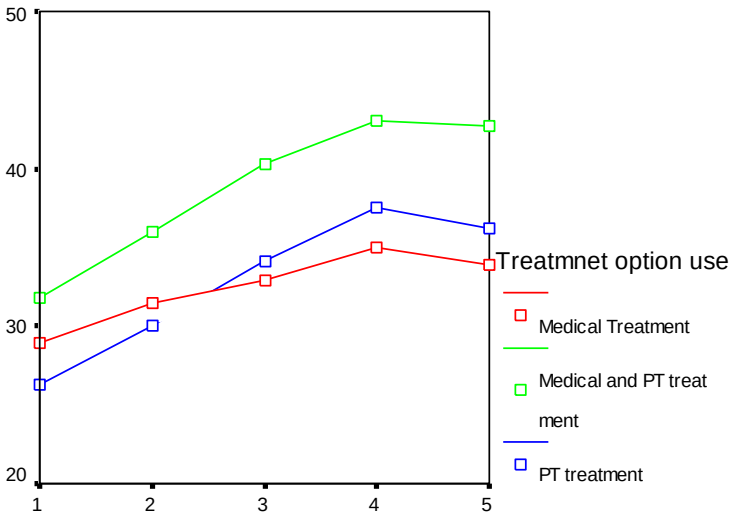
Treatment Option Used Vs Medial Rotation (p-value) = 0.299

(Figure XIII) Medial rotation was same when measured on different intervals i.e. (p-value = 0.339). When Medial rotation was compared with treatment options used it turns out to be insignificant (p-value = 0.299) i.e. Medial rotation was same in treatment options used for the patients.

Follow-up for Lateral Rotation with respect to Treatment option used

Treatment Option Used		Mean	Std. Deviation	N
Lateral rotation before treatment	Medical Treatment	28.92	7.11	14
	Medical and PT treatment	31.75	4.94	20
	PT treatment	26.25	5.91	16
	Total	29.20	6.25	50
Lateral rotation after 1 week	Medical Treatment	31.42	9.69	14
	Medical and PT treatment	36.00	5.28	20
	PT treatment	30.00	6.83	16
	Total	32.80	7.57	50
Lateral rotation 2 weeks	Medical Treatment	32.85	10.50	14
	Medical and PT treatment	40.25	5.49	20
	PT treatment	34.06	5.23	16
	Total	36.20	7.79	50
Lateral rotation after 4 weeks	Medical Treatment	35.00	10.91	14
	Medical and PT treatment	43.00	4.97	20
	PT treatment	37.50	5.47	16
	Total	39.00	7.88	50
Lateral rotation after 6 weeks	Medical Treatment	33.92	10.95	14
	Medical and PT treatment	42.75	5.95	20
	PT treatment	36.25	5.91	16
	Total	38.20	8.43	50

Treatment Option Used (p-value) = 0.000



Treatment Option Used Vs Lateral Rotation (p-value) = 0.002

(Figure XIV) Lateral rotation was significantly different when measured on different intervals i.e. (p-value = 0.000). When Lateral rotation was compared with treatment options used it turns out to be significant (p-value = 0.002) i.e. Lateral rotation was different in treatment options used for patients.

Discussion

People during the fourth and fifth decades of life are more prone to suffer with PS. The mean age in this study was 46.26 ± 8.25 years with minimum age was 30 years and maximum age was 60 years. As the females have wider quadriceps femoris muscle angle so they are more prone to suffer with PS as compare to males. In this study comprises of 24 female patients and 26 male patients. Because PS is puzzled with other conditions so difficulty arose in accurate finding of exact prevalence of PS.

In many conditions those presented as Low Back Pain including PS, (NSAIDS) and acetaminophen had been widely used as medicine of choice. After one week of treatment, there was dramatic reduction in Symptoms in Patients taking NSAIDs, compared with the patients using placebo. After 14 days of treatment, Muscle relaxants were found nearly five times better as compared to placebo. While in carefully selected patients, Steroid injections were proven very helpful.

Selected exercises and stretching techniques were applied in patients who were given Physical Therapy Treatment. The aim of physical therapy is to eliminate symptoms and it was done through a structured program designed to increase the ROM and the supporting strength of these muscle groups In this study flexion before the treatment and when measured at different intervals after the start of the treatment, it was different for all the treatment options which were used for patients and in the treatment group in which patient was given medical and physiotherapy flexion was quite improved as compared to other treatment groups. i.e. (p-value = 0.001) It has been reported in some studies that heat therapy, cold therapy, BTX-A injection, and ultrasound gives additional benefit when used along with Physical Therapy. In order to lessen the discomfort associated with direct treatment applied to an irritated or tense piriformis muscle, Heat or cold therapy can be given before Physiotherapy session or home based exercise Program. In this study Lateral rotation before the treatment and when measured at different intervals after the start of the treatment it was different for all the treatment options which were used for patients and in treatment group in which patient was given medical and physiotherapy was quite improved as compared to other treatment groups. i.e. (p-value = 0.002) Both Iontophoresis and sonophoresis have been beneficial along with physical therapy though neither has been studied extensively in the treatment of patients with PS.

Conclusion

On the basis of results, it is concluded that the prognosis of the disease is best in the group of patients whom both the physical and medical treatment was given, rather than the other two groups whom only physical or only medical treatment was given. It justifies the hypothesis of this study report that "The combination of Physiotherapy and Medicine is a better management tool for the treatment of piriformis syndrome".

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