www.jmscr.igmpublication.org
Impact Factor (SJIF): 6.379
Index Copernicus Value: 71.58
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v6i4.207

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Original Clinical Research

A Study to Observe the Clinical Improvement after Intervention at Piriformis Point Using Steroid and Local Anaesthetics in Patients with Chronic Piriformis Syndrome with Radiation to Lower Limb

Authors
Dr Siddhartha Sinha Ray[1], Dr Kshetra Madhab Das[2]*, Prof. (Dr.) Nityananda Kar[3]
[1]Senior Resident, Dept. of P.M. & R, NRS Medical College & Hospital, Kolkata
[2]Associate Professor, Dept. of P.M. & R, NRS Medical College & Hospital, Kolkata
[3]Professor & Head, Dept of P.M. & R, NRS Medical College & Hospital, Kolkata
*Corresponding Author
Dr. Kshetra Madhab Das
Associate Professor, Dept of P.M. & R, NRS Medical College & Hospital, Kolkata, India
Email: *kmdpmr@yahoo.com*, Mob: 9830790414

Abstract
Piriformis syndrome is believed to result from compression of the sciatic nerve around the piriformis muscle. Symptoms may include pain and numbness in the buttocks and down the leg. Intervention done by injecting steroid and local anaesthetic agents at the piriformis point is considered as a part of the important nonsurgical management of piriformis syndrome. The aim of this study was to observe the clinical improvement after piriformis point intervention using steroid and local anaesthetics in patients with chronic piriformis syndrome with radiation to lower limb. Twenty eight patients, a part from getting treatment with Non Steroidal Anti Inflammatory Drugs (NSAIDs), muscle relaxants, pregabalin, static spinal exercise, piriformis stretching exercise and local heat, received intervention at piriformis point with steroid and local anaesthetic. Patients were assessed by piriformis point tenderness, radiation, Straight Leg Raising test (SLR) and activity scores before and two weeks after intervention. Resultant data of twenty four patients who have completed the study were analysed in Statistica version6 software with appropriate statistical tools like Kolmogorov-Smirnov goodness-of-fit test, paired t test, frequency distribution. Significant improvement is noted in all outcome measurement tool scores. Though piriformis on both sides have shown improvement, significantly better improvement of piriformis tenderness of intervention side over opposite side clearly indicates towards the direct effect of intervention locally while not ruling out its indirect systemic effect on the opposite side as well.
Keywords: *Piriformis Syndrome; Steroid and Local Anaesthetics, Piriformis point Intervention.*

Introduction

Piriformis Syndrome is a peripheral neuritis of the sciatic nerve caused by an abnormal condition of the piriformis muscle.[1] More than 16% of all adult work disability evaluations and examinations are performed to rate the patient's partial or total disability associated with chronic low back pain.[2] It is estimated that at least 6% of patients who are diagnosed as having low back pain actually have piriformis syndrome.[3,4,5]

Usual symptoms and signs of piriformis syndrome that help to make a clinical diagnosis are as follows[6,7,8,9,10,11]

Symptoms

1) Pain with sitting, standing, or lying longer than 15 to 20 minutes. 2) Pain and/or paraesthesia radiating from sacrum through gluteal area and down posterior aspect of thigh, usually stopping above knee. 3)Pain improves with ambulation and worsens with no movement. 4) Pain when rising from seated or squatting position. 5) Change of position does not relieve pain completely. 6) Contralateral sacroiliac pain. 7) Difficulty in walking (eg, antalgic gait, foot drop). 8) Numbness in foot. 9) Weakness in ipsilateral lower extremity. 10) Headache. 11) Neck pain. 12) Abdominal, pelvic, and inguinal pain. 13)Dyspareunia in women. 14)Pain with bowel movements

Signs

1) Tenderness in region of sacroiliac joint, greater sciatic notch, and piriformis muscle. 2) Tenderness over piriformis muscle. 3) Palpable mass in ipsilateral buttock. 4) Traction of affected limb provides moderate relief of pain. 5) Asymmetrical weakness in affected limb. 6) Piriformis sign positive. 7) Lasègue sign positive. 8) Freiberg sign positive. 9) Pace sign (flexion, adduction, and internal rotation test result) positive. 10) Beatty test result positive. 11)Limited medial rotation of ipsilateral lower extremity. 12) Ipsilateral short leg. 13) Gluteal atrophy (chronic cases only). 14) Persistent sacral rotation toward contralateral side with compensatory lumbar rotation

Injection at piriformis point with steroid and local anaesthetic has been one of the common modes of non surgical treatment in piriformis syndrome. The site of injection is located by using SI joint and greater trochanter as landmarks.[12,13]

A number of studies with intervention at piriformis point have indicated clinically significant improvement after injection in patients with piriformis syndrome.[12,14,15,16]

Aims and Objectives

This study has been conducted with the aim to observe whether there is significant improvement in patients with chronic piriformis syndrome after intervention at piriformis point using steroid and local anaesthetics.

Materials and Methods

This Prospective Study was conducted in the Department of Physical Medicine & Rehabilitation. N.R.S. Medical College & Hospital, Kolkata.

Approval from the Institutional Ethical Committee for the study and Informed consent from all patients included in the study were obtained. Twenty eight patients of clinically diagnosed piriformis syndrome were included in the study. Patients with peripheral neuropathy, myelopathy, bone disorders, neuro-mascular conditions, inflammatory conditions, cardiac conditions, local or systemic infections, diabetes and patients having contra indications to steroid and local anaesthetics were excluded from the study.

All patients were treated with NSAIDs, muscle relaxant, pregabalin, static spinal exercise, piriformis stretching exercise and local heat. Patients were assessed as per assessment criteria. Piriformis point tenderness, radiation, Straight Leg Raising test (SLR) and activity score were assessed.

All patients received intervention at piriformis point of the respective side with symptoms with steroid (triamcinolone acetonide) and local anaesthetics (bupivacaine 0.25%). The patients were assessed using outcome assessment tools as per study protocol before injection (0 week) and 2 weeks after injection.

Four patients dropped out during follow up. Finally, twenty four patients completed the study.

Resultant data were analysed in Statistica version6 software with appropriate statistical tools as applicable like Kolmogorov-Smirnov goodness-of-fit test, paired t test, frequency distribution.

Result

Twenty eight patients were initially included in the study but later four of them dropped out during follow up and ultimately twenty four patients completed the study. Age of the patients ranged from 30 years to 61 years with mean age of 43.21 years. Symptom duration ranged from 6 months to 3 years with mean being 15.71 months. Among the twenty four patients fifteen are female and nine are male.

Among twenty four patients, three complained of bilateral pain, nine complained of only right sided radiation and twelve patients complained of only left sided radiation (Table 1). Intervention was done on the side of pain in all twenty one cases of unilateral symptom while three patients with complain of bilateral radiation were given injections on the side of maximum pain and incidentally all of them received injection on the left side. Altogether Fifteen patients received intervention on left side and nine patients received it on the right side. (Table 2)

All Five parameters of assessment such as piriformis point tenderness of intervention side; piriformis point tenderness of opposite side; radiation score; SLR of the intervention side; SLR of the opposite side; and activity score have shown statistically significant improvement from pre intervention to post intervention follow up. (Table 3)

Improvement in piriformis point tenderness is observed in both the sides irrespective of the side of intervention but more improvement is seen on the ipsilateral side and this difference between ipsilateral and contralateral side is shown to be statistically significant. (Table 4)

Regarding SLR, improvement is also observed in both the sides irrespective but more on the ipsilateral side and this difference between ipsilateral and contralateral side is also statistically significant. (Table 5)

Table 1: Side of pain

side	**BL**	**RT**	**LT**	Total
no.	3	9	12	24
Row %	12.5%	37.5%	50%	

Table 2: Side of Intervention

Side	**RT**	**LT**	**Totals**
2	9	15	24
Row %	37.5%	62.5%	

Table 3: Before-after comparison of numerical variables – paired t test

Variables	Mean	Std.Dv.	N	Diff.	Std. Dv. Diff.	t	df	p
ScRadiat_1	6.38	1.765	24	2.5000	0.511	23.979	23	0.000
ScRadiat_2	3.88	1.569						
ScPainPIpsi_1	7.37	0.495	24	4.8750	1.650	14.473	23	0.000
ScPainPIpsi_2	2.50	1.445						
ScPainPContra_1	1.13	2.133	24	0.8750	1.569	2.732	23	0.012
ScPainPContra_2	0.25	0.676						
SLRIpsi_1	43.75	16.101	24	-18.7500	7.974	-11.519	23	0.000
SLRIpsi_2	62.50	9.891						
SLRContra_1	67.50	9.891	24	-6.2500	10.135	-3.021	23	0.006
SLRContra_2	73.75	7.109						
ScActive_1	2.75	0.676	24	-3.3750	0.495	-33.434	23	0.000
ScActive_2	6.13	0.797						

Table 4: Comparison of piriformis point tenderness improvement between Intervention Side and Opposite Side (paired t test)

variables	Mean	Std.Dv.	N	Diff.	Std.Dv. Diff.	T	df	p
Diff Pain Ipsi	4.88	1.650	24	4.000	1.911	10.2539	23	0.000
Diff Pain Contra	0.88	1.569						

Table 5 Comparison of SLR improvement between Intervention Side and Opposite Side (paired t test)

variables	Mean	Std.Dv.	N	Diff.	Std.Dv. Diff.	T	df	p

Diff SLR Ipsi	18.75	7.974	24	12.500	9.891	6.1914	23	0.000
Diff SLR Contra	6.25	10.135						

Discussion

Twenty four patients of chronic piriformis syndrome with mean age of 43.21 years and average duration of symptoms around 16 months completed our study. Among those patients 9 were male and 15 were female patients. Both the average age of the study population and the obvious female preponderance corroborates with epidemiological profile found in other studies with patients of piriformis syndrome.[12,14,15]

Three out of total twenty four patients had piriformis pain and tenderness on both side and all of them had more intense pain on the left side. The other twenty one patients had unilateral symptoms. Of them twelve had pain on the left side and rest nine had pain on the right side. Here clear predominance of left sided pain is an interesting observation.

In study by Benzon et al[12] similar preponderance of left sided piriformis pain has been noted. But another study by Osizik et al[14] showed right sided preponderance.

Significant improvement is seen after two weeks of follow up in piriformis tenderness both on intervention side and the opposite side, Radiation Score, Activity Score and SLRs both on ipsilateral and contralateral side. Improvement seen in all the parameters of the study clearly points to the effectiveness of the treatment provided to the patients.

Similar studies by Benzon et al[12], Ozisik et al[14], Jeong et al[15] and Rivers et al[16] have shown similar type of statistically significant improvement after local intervention in patients of piriformis syndrome.

Though piriformis tenderness on both intervention side and opposite side has shown improvement, there is significant difference between the improvement of piriformis tenderness of intervention side and opposite side. Ipsilateral side (on the side of intervention) has shown better improvement than the contralateral side (on the opposite side of intervention) and this difference in improvement is shown to be statistically significant. It indicates that the efficacy of the intervention to improve the ipsilateral side pain probably due to direct local effect is significantly better than the improvement on the contralateral side which may be due to indirect systemic effect of the injection or resultant biomechanical alteration associated with pain control.

Improvement of SLR follows a similar kind of pattern like the tenderness of piriformis. Here also improvement is better on the intervention side than the opposite side. This may be due to direct effect of the decrease in pain at the piriformis.

Conclusion

Significant improvement in follow up is seen in piriformis point tenderness on both side, radiation, activity score and SLRs of both sides providing evidences of clinical efficacy of intervention at piriformis point in piriformis syndrome. Most importantly tenderness on ipsilateral side has shown better improvement than tenderness on contralateral side. This fact points towards the direct local action on ipsilateral side while also highlighting the indirect systemic action or effect of biomechanical alteration on contralateral side.

Acknowledgement

Prof. (Dr.) Avijit Hazra- Professor, Dept. of Pharmacology, IPGME & R, Kolkata for Statistical Analysis

Funding/Support Source /: NIL

References

1. Di Giovanna EL, Schiowitz S, Dowling DJ, eds. An Osteopathic Approach to Diagnosis and Treatment. 3rd ed. Philadelphia, Pa: Lippincott Williams &Wilkins; 2005.
2. Centers for Disease Control and Prevention. Prevalence of disabilities and associated health conditions among adults—United States, 1999 [published correction

appears in MMWR Morb Mortal Wkly Rep. 2001;50:149]. MMWRMorb Mortal Wkly Rep. 2001;50:120-125.
3. Pace JB, Nagle D. Piriformis syndrome. West J Med. 1976;124:435-439.
4. Papadopoulos EC, Khan SN. Piriformis syndrome and low back pain: a new classification and review of the literature. Orthop Clin North Am. 2004;35:65- 71.
5. Hallin RP. Sciatic pain and the piriformis muscle. Postgrad Med. 1983;74:69- 72.
6. Chaitow L. Soft Tissue Manipulation: A Practitioner's Guide to the Diagnosis and Treatment of Soft-Tissue Dysfunction and Reflex Activity. 3rd ed.Rochester, Vt: Healing Arts Press; 1988.
7. Benson ER, Schutzer SF. Posttraumatic piriformis syndrome: diagnosis and results of operative treatment. J Bone Joint Surg Am. 1999;81:941-949.
8. Te Poorten BA. The piriformis muscle. J Am Osteopath Assoc. 1969;69:150- 160.
9. Foster MR. Piriformis syndrome. Orthopedics. 2002;25:821-825.
10. Retzlaff EW, Berry AH, Haight AS, Parente PA, Lichty HA, Turner DM, et al. The piriformis muscle syndrome. J Am Osteopath Assoc. 1974;73:799-807.
11. Hughes SS, Goldstein MN, Hicks DG, Pellegrini VD. Extrapelvic compression of the sciatic nerve. An unusual cause of pain about the hip: report of five cases. J Bone Joint Surg Am. 1992;74:1553-1559.
12. Honorio T. Benzon, M.D.,* Jeffrey A. Katz, M.D.,Hubert A. Benzon, B.A., Muhammad S. Iqbal, M.D.Piriformis Syndrome Anatomic Considerations, a New Injection Technique, and a Review of the Literature Anesthesiology 2003; 98:1442–8 © 2003
13. Fishman SM, Caneris OA, Bandman TB, Audette JF, Borsook D: Injection of the piriformis muscle by fluoroscopic and electromyographic guidance. Reg Anesth Pain Med 1998; 23:554–9
14. Pinar Akdemır Ozısık1, Mustafa Toru2, C. Cem Den k3, Ozden O. Taskıran4, Begum Gundog mus4 CT-Guided Piriformis Muscle Injection for the Treatment of Piriformis Syndrome Piriformis Sendromu Tedavisinde BT Eşliğinde Piriformis Enjeksiyonu Turk Neurosurg 2014, Vol: 24, No: 4, 471-477
15. Hee Seok Jeong, Guen Young Lee, Eu Gene Lee, Eu Gene Joe, Joon Woo Lee, Heung Sik Kang Long-term assessment of clinical outcomes of ultrasound-guided steroid injections in patients with piriformis syndrome Ultrasonography 34(3), July 2015
16. W. Evan Rivers, Juan Francisco Asenjo, Myofascial Injections in Practical Management of Pain (Fifth Edition), 2014