

RELATIONSHIP BETWEEN LOW BACK PAIN AND HAMSTRING TIGHTNESS

¹ V. Menaka, MPT (ortho), MIAP, ² S.Shankar, MOT (Psychiatry) ³ Raghuram.P, MOT (Paediatric)

¹ Lecturer, Division of Physical Medicine and Rehabilitation, Rajah Muthiah Medical College and Hospital, Annamalai University,

² Senior Tutor, Division of Physical Medicine and Rehabilitation, Rajah Muthiah Medical College and Hospital, Annamalai University,

³ Asst. Professor, Dept.of O.T, SRMC & RI, Chennai

Abstract: This study has been undertaken to investigate Relationship between Low Back Pain and Hamstring Tightness with objective of evaluating any relationship between Low Back Pain and Hamstring tightness by using A double arm plastic goniometer as an experimental tool to measure popliteal angle and by using the experimental design regarding the selection of subjects, selection of experimental variable, testing program. One group consisting of 50 patients with Low Back Pain for a period of more than 6 months and another group consisting of 50 patients without low back pain were taken for this study. With regard to selection of patients under each group, enough care has been taken to establish one to one correspondence of individuals in two groups with sex and age. 76% of the study group with No Low Back Pain had Hamstring tightness to the extent of 40°. 78% of the study group with Low Back Pain had Hamstring tightness above 40°, suggesting the relationship between Hamstring tightness and Low Back Pain clearly. It may be concluded that the Hamstring tightness differs significantly between the patients with Low Back Pain and with No Low Back Pain. Hence, the possibility of a relationship between Hamstring tightness and Low Back Pain is justified. It is so for both right side and left side.

INTRODUCTION

“It is an important to know as much about the man who has the pain, as it to know the pain the man has”.

Low back pain is one of the most common and incapacitating disorders in modern society. In general 60 to 80 percent of the normal population will suffer from Low Back Pain some day and that between 20% and 30% are suffering from it at any given time. It has been around for as long as history has been recorded. It is a national, personal and clinical problem; national because it is experienced in most population; personal because it can remain a major unresolved dilemma and clinical because difficulty in diagnosis and treatments are conflicting and often unrewarding.

The development and maintenance of healthy low back function requires a balance of balance of flexibility, strength and endurance. Specifically the critical components are: low back lumbar flexibility, hamstring flexibility, hip flexor flexibility, strength and endurance of the forward and lateral abdominals and strength and endurance of the back extensor muscles. Most of our populations have some amount of hamstring tightness. So, in the present study, the relationship between low back pain and hamstring tightness has been investigated.

There are various methods available for the evaluation of hamstring tightness. In the study, popliteal angle is used as an investigative tool for the measurement of hamstring tightness.

OBJECTIVE

- ❖ To evaluate any relationship between Low Back Pain and Hamstring tightness.

REVIEW OF LITERATURE

Fartan 1975, Foster and fulton 1991, have shown that a lack of pelvic mobility due totightness in the hip flexors, could limit pelvic mobility and cause strain on the lumbar spine. Hence the investigations suggested adequate flexibility of the oblique, Hamstring, hip flexor and low back muscles is necessary for a healthy lower back.

Plowman 1992, have shown that there is a significant relationship between Hamstring tightness and Low Back Pain.

Harreby M. Nygaard B, Jessen T, Larsen E, Storr-Paul, Lindahl A, Fisher I, Laegard E, conducted a cross sectional questionnaires based on survey of low back pain in 13-16 year old children. The questionnaire were divided into two parts which contain about the children's leisure time sports activity and Low Back Pain in relation to frequency and severity, influence of daily living and use of health system. The school doctor measured body height and weight, degree of hypermobility and the tightness of the Hamstring muscles. The results showed increase in low Back Pain prevalence of 6.4% from 14-15 years of age, independent of gender, 14% fulfilled the criteria for general hypermobility and 12.2% had tightness of Hamstring muscles of more than 40°.

Sharpe, Liehmon And Snodgrass 1988, says that recurrent back pain has been found to be predictable from both low lumbar extension range of motion and low Hamstring flexibility.

METHODOLOGY

The experimental design regarding the selection of subjects, selection of experimental variable, testing program are presented in this chapter.

Selection of subjects

One group consisting of 50 patients with Low Back Pain for a period of more than 6 months and another group consisting of 50 patients without low back pain were taken for this study.

With regard to selection of patients under each group, enough care has been taken to establish one to one correspondence of individuals in two groups with sex and age.

Inclusions Criteria

- Both male and female patients were selected.
- One group of patients with Low Back Pain of 6 months and another group of patients without Low Back Pain.
- These patients had no neurological involvement.
- The age group varies between 35 and 55 years.

Experimental tools

A double arm plastic goniometer was used to measure popliteal angle.

Orientation of subject

Prior to the measurement, the investigator convinced the purpose of the study to the subjects to win their confidence and to get maximum possible co-operation from the subjects.

Testing Program

- Each patient is positioned in supine lying with one hip flexed to 90° and knee of the same limb also fully flexed.
- Place the fixed axis of the goniometer on the lateral condyle of the femur, fixed arm is parallel to the femur and the movable arm is parallel to the leg.
- Then, the knee extension is done up to 0°, by maintaining hip in 90° flexion.
- The same procedure is done in another limb also.
- If the knee can be fully straightened or to within 10°, then the hamstrings are within normal limits.
- If the leg can only be partially extended, it indicates tight hamstrings.

DATA ANALYSIS AND STATISTICS

S.NO	AGE/ SEX	OP/IP NO.	POPLITEAL ANGLE	
			LT	RT
1	45/F	8706	43°	55°
2	48/F	10832	40°	35°
3	50/M	5636	52°	49°
4	43/M	4858	45°	40°
5	41/M	67753	30°	40°
6	55/F	56678	51°	49°
7	55/F	9837	39°	64°
8	35/M	5965	65°	90°
9	35/M	71414	60°	40°
10	35/M	1900	55°	52°
11	54/F	4396	26°	35°
12	53/F	89308	55°	51°
13	35/M	6248	50°	58°
14	41/M	4111	62°	61°
15	35/M	2859	62°	58°
16	38/M	90807	51°	48°
17	38/F	89587	49°	53°
18	36/F	77315	25°	50°
19	35/F	76829	65°	65°
20	47/F	77969	60°	50°
21	45/F	77433	40°	40°
22	36/F	99042	45°	47°
23	37/F	97222	49°	52°
24	38/F	97328	53°	48°
25	48/F	10822	45°	47°
26	48/F	250295	22°	45°
27	40/F	99928	45°	40°
28	40/F	79080	75°	70°
29	36/F	71425	65°	60°
30	35/F	95374	49°	43°
31	50/F	99641	45°	48°
32	35/F	76940	30°	35°
33	42/F	10916	55°	55°

34	45/F	96665	49 ⁰	43 ⁰
35	45/F	89506	58 ⁰	52 ⁰
36	46/F	5620	45 ⁰	42 ⁰
37	50/F	86633	65 ⁰	65 ⁰
38	35/F	48383	40 ⁰	45 ⁰
39	40/F	74787	87 ⁰	85 ⁰
40	50/F	8315	52 ⁰	50 ⁰
41	50/F	69985	45 ⁰	40 ⁰
42	45/F	77525	46 ⁰	30 ⁰
43	45/M	70990	45 ⁰	53 ⁰
44	55/F	88432	50 ⁰	47 ⁰
45	54/F	72360	50 ⁰	55 ⁰
46	35/F	5810	10 ⁰	45 ⁰
47	35/F	254956	48 ⁰	60 ⁰
48	45/F	9941	43 ⁰	45 ⁰
49	35/F	99483	30 ⁰	40 ⁰
50	35/F	10839	47 ⁰	49 ⁰
MEAN			48.26⁰	50.38⁰

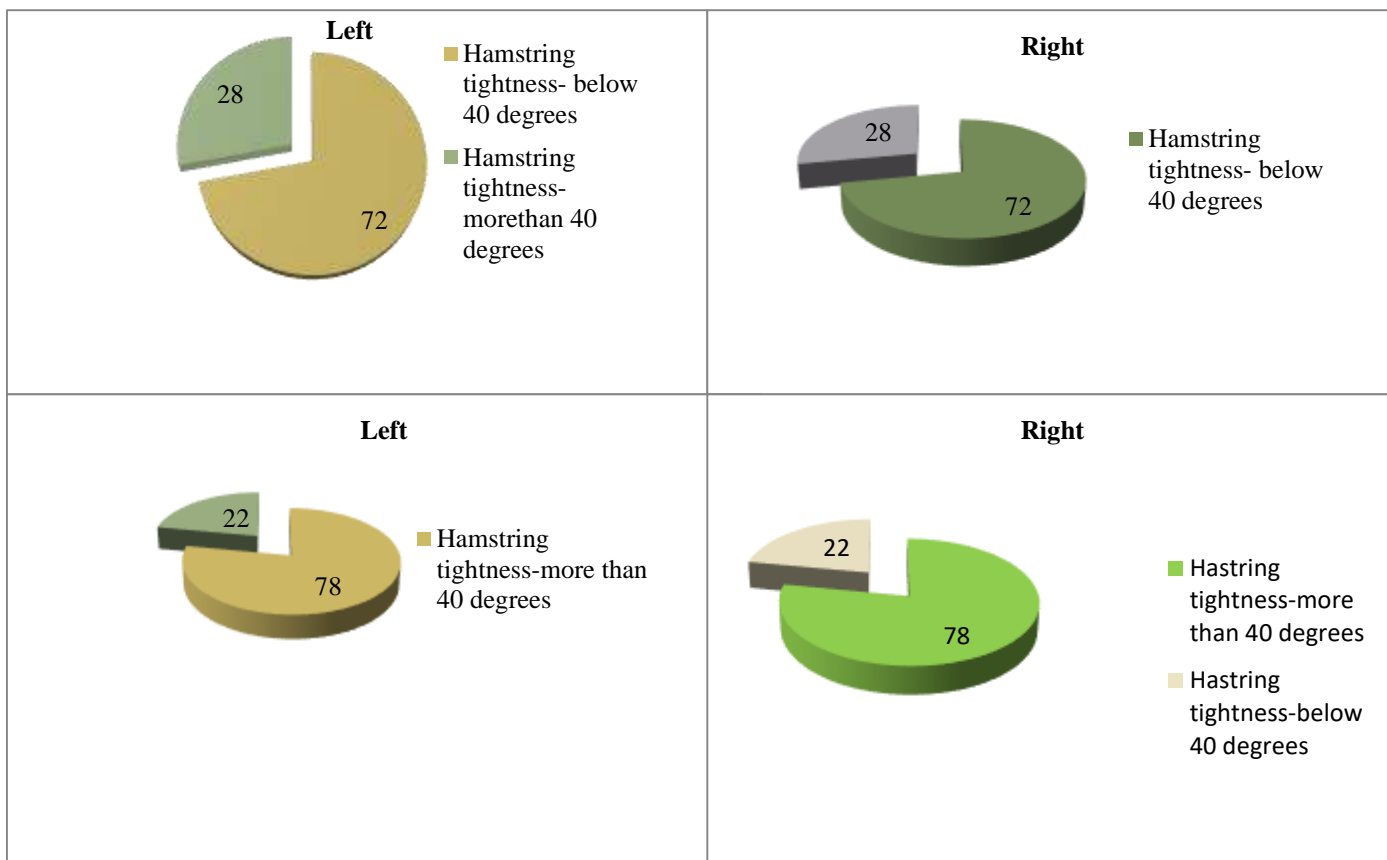
LOW BACK PAIN GROUP

NO LOW BACK PAIN GROUP

S.NO	AGE/ SEX	OP/IP NO.	POPLITEAL ANGLE	
			LT	RT
1	47/F	91677	21 ⁰	41 ⁰
2	50/F	71909	30 ⁰	30 ⁰
3	52/M	94160	41 ⁰	38 ⁰
4	45/M	7853	32 ⁰	38 ⁰
5	43/M	72500	40 ⁰	45 ⁰
6	55/F	81673	32 ⁰	34 ⁰
7	55/F	99354	31 ⁰	36 ⁰
8	35/M	91474	33 ⁰	35 ⁰
9	35/M	86052	40 ⁰	35 ⁰
10	35/M	89025	50 ⁰	40 ⁰
11	53/F	90181	65 ⁰	60 ⁰
12	52/F	90249	40 ⁰	40 ⁰
13	35/M	12620	37 ⁰	30 ⁰
14	42/M	71739	40 ⁰	40 ⁰
15	35/M	4665	35 ⁰	28 ⁰
16	36/M	92391	33 ⁰	38 ⁰
17	40/F	78341	45 ⁰	40 ⁰
18	38/F	95790	47 ⁰	42 ⁰
19	35/F	96640	41 ⁰	33 ⁰
20	45/F	97041	43 ⁰	40 ⁰
21	45/F	254473	40 ⁰	35 ⁰
22	38/F	83969	48 ⁰	45 ⁰
23	39/F	6302	35 ⁰	38 ⁰
24	40/F	9233	27 ⁰	32 ⁰
25	46/F	7541	27 ⁰	23 ⁰
26	50/F	9983	26 ⁰	38 ⁰
27	40/F	25440	32 ⁰	44 ⁰
28	40/F	6343	35 ⁰	30 ⁰
29	35/F	99910	40 ⁰	35 ⁰
30	35/F	99668	32 ⁰	35 ⁰
31	51/F	8302	40 ⁰	43 ⁰
32	35/F	7271	32 ⁰	35 ⁰
33	42/F	78726	30 ⁰	35 ⁰
34	45/F	79145	30 ⁰	25 ⁰
35	45/F	8147	35 ⁰	15 ⁰
36	46/M	3249	38 ⁰	40 ⁰
37	50/F	7718	27 ⁰	30 ⁰
38	35/M	94646	38 ⁰	40 ⁰
39	40/F	25309	40 ⁰	38 ⁰
40	51/F	2293	40 ⁰	43 ⁰
41	50/M	11964	40 ⁰	45 ⁰
42	45/F	26087	40 ⁰	35 ⁰
43	46/M	21002	36 ⁰	40 ⁰
44	53/F	26079	37 ⁰	42 ⁰
45	55/M	21021	36 ⁰	43 ⁰
46	35/F	257283	45 ⁰	38 ⁰
47	37/F	25428	48 ⁰	52 ⁰
48	47/F	99608	36 ⁰	38 ⁰
49	35/F	7761	33 ⁰	30 ⁰
50	35/F	26064	46 ⁰	45 ⁰
MEAN			37.3⁰	37.4⁰

RESULTS

- ❖ 76% of the study group with No Low Back Pain had Hamstring tightness to the extent of 40°.
- ❖ 78% of the study group with Low Back Pain had Hamstring tightness above 40°, suggesting the relationship between Hamstring tightness and Low Back Pain clearly.



DISCUSSION

This study was done on patients with Low Back Pain and without Low Back Pain. I had selected 100 patients based on the selection criteria. Those patients were divided into 2 groups contain 50 patients each. They were measured Hamstring tightness by popliteal angle to find whether there is any relationship with Low Back Pain. Hence according to my study, the result obtained on the basis of statistical analysis and the test for equality of means carried out for right side measurement shows, 'Z' value 6.86 which is greater than 1.96 leads to rejection of null hypothesis and the result with the left side shows the 'Z' value computed greater than 1.96. Hence, concluded that average amount of Hamstring is not same for patients with and without Low Back Pain.

It may also be noted that 'Z' value calculated for right side observations is larger than 'Z' value pertaining to left side measurements.

These results have been concluded because, the inflexible hamstrings,

- ❖ Disrupts forward and lateral movement places excessive stretch on hamstrings, leading to low back and hamstring pain.
- ❖ Restricts anterior pelvic rotation and exaggerates posterior tilt; both cause increased disc compression; excessive stretching causes strain and pain⁽⁵⁾.

Foster and Fulton in 1991, suggested that adequate flexibility of the oblique, hamstring, hip flexor and low back muscles is necessary for a healthy lower back.

Then, plowman in 1992, have also shown that there is a significant relationship between Hamstring tightness and Low Back Pain.

And also Harreby M. Nygaard B, Jessen T, Larsen E, Storrpaul conducted a cross sectional questionnaires based on the survey of low back pain in 13-16 year old children and resulted that 14% fulfilled the criteria for general hypermobility and 12.2% had tightness of hamstring muscles of more than 40 degrees.

Cailliet 1998, Gracovetsky 1990, says that effective functioning of back requires. Coordination of all vertebrae, the pelvis, the hip and thigh muscles, the fascia and ligaments.

Nourbakhsh MR, Arab AM, conducted a study on relationship between mechanical factors and incidence of low back pain and resulted that only muscle endurance and weakness are associated with Low Back Pain and structural factors such as size of lumbar lordosis, pelvic tilt, leg length discrepancy and the length of abdominal, hamstring and iliopsoas muscles are not associated with the occurrence of Low Back Pain.

Hence, in this study, I had found that there is relationship between Hamstring tightness and Low Back Pain. Still large samples of study will provide better results.

Further, this study can also be done to find whether there is any relationship between Low Back Pain and structural factors such as size of lumbar lordosis, pelvic tilt, leg length discrepancy and the length of abdominal and iliopsoas.

CONCLUSION

It may be concluded that the Hamstring tightness differs significantly between the patients with Low Back Pain and with No Low Back Pain. Hence, the possibility of a relationship between Hamstring tightness and Low Back Pain is justified. It is so for both right side and left side.

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