

Research Article

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Efficacy of Sacroiliac Joint Manipulation with Exercises and Pelvic Tilt Exercises in Treatment of Low Back Pain

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Abstract

Keywords

Sacroiliac Joint Manipulation, Pelvic Tilt Exercises and Low Back Pain.

Low back pain is a very common problem across the world. The Sacroiliac (SI) joint dysfunction is one of the major causes of low back pain. Dysfunction of the sacroiliac joint can occur from an imbalance in the pelvis. Physiotherapy is one of the most widely used forms of treatment adopted for gaining relief from low back pain. The present study aimed to find out the efficacy of sacroiliac joint manipulation with exercises and Range of motion exercises in the low back pain patients with sacroiliac joint dysfunction. The study concluded from the results that the overall improvement in low back pain is better in the patients who were given Sacro-iliac joint manipulation with exercises as compared to the patients who were given supine pelvic tilt exercises only.

Introduction

Low back pain is defined as an acute, sub-acute or chronic discomfort localized to the anatomic area below the posterior ribs and above the lower margins of the buttock. Low back pain is second only to the common cold as the most common affliction of mankind. According to the European Guidelines for prevention of low back pain, low back pain is defined as "pain and discomfort, localized below the costal margin and above the inferior gluteal folds, with or without leg pain. Chronic low back pain may originate from an injury, disease or stresses on different structures of the body.

The Sacroiliac (SI) joint dysfunction is one of the major causes of low back pain. Dysfunction of the sacroiliac joint can occur from an imbalance in the pelvis. Sustained unilateral force can create an imbalance of stress on the SI joints. According to the report of World Health Organization in 2002, LBP

constituted 37% of all occupational risk factors which occupies first rank among the disease complications caused by work.

Physiotherapy is one of the most widely used forms of treatment adopted for gaining relief from low back pain. It is used in both modes, as a single line of treatment as well as in combination with other treatments such as massage, heat, traction, ultrasound or short wave diathermy. Physiotherapy is ideal for treating mechanical back pain.

The sacroiliac joint (SIJ) is a common pain generator for individuals with low back pain (LBP). The treatment of low back pain remains controversial in spite of a growing number of attempts to evaluate different therapeutic interventions and to develop clinical guidelines. Therefore, the research studies are needed to evaluate the efficacy of therapies used for

management of low back pain with SI joint dysfunction and to reveal the key points of treatment therapy. On the line of this requirement and keeping above in view, the present attempt has been made and planned to see the efficacy of sacroiliac joint manipulation with exercises and ROM exercises (pelvic tilt) in treatment of low back pain.

Objective

To find out the efficacy of sacroiliac joint manipulation with exercises and Range of motion exercises (supine pelvic tilt) on improvement in the low back pain patients with sacroiliac joint dysfunction.

Methodology

The study was conducted at the department of physiotherapy and rehabilitation, Tanta General Hospital, Ganganagar(Rajasthan).A pre-test post-test control group design was used for this study.

120 eligible respondent patients aged 18 to 45 years, including male and female, were selected as sample. 60 patients were included in group- A and 60 for group- B out of 120 samples.

Group A where the selected 60 patients were provided with Sacro-iliac joint manipulation with exercises and Group B where the selected 60 patients were provided with ROM exercises (supine pelvic tilt).

Inclusion Criteria

1. Patients with low back pain referred to physical therapy.
2. Both males & females.
3. Age group: 18-45 years.
4. A chief complaint of pain in the lumbar spine, buttocks and / or lower extremity.
5. A baseline Oswestry disability score of at least 30%
6. At least 3 of 4 commonly used sacroiliac joint Dysfunction tests were positive.

Exclusion Criteria

1. Current pregnancy.
2. Signs consistent with nerve root compression (positive straight leg raise (SLR) test at less than 450, or diminished lower extremity strength, sensation or reflexes.
3. Prior lumbar spine surgery.

4. A history of osteoporosis or spinal fracture.
5. Patients with red flags for serious spinal conditions.

Instruments and tools used for data collection

1. Height adjustment treatment table
2. Visual Analogue Scale (VAS)
3. Modified Oswestry Low Back Pain Disability Questionnaire
4. Measurement of Sacroiliac Joint Dysfunction through
 - I. The Standing Flexion Test
 - II. The Prone Knee Flexion Test
 - III. The Supine Long-Sitting Test
 - IV. Sitting Posterior-Superior Iliac Spines Palpation

Pre-test Assessment

All the subjects were tested using pre-test measurements which included:

- Calculation of spinal range of motion measurement
- Lumbar flexion
- Lumbar Extension
- Lumbar Right and left Side Flexion
- Functional disability measurement using the Oswestry Low Back Pain Disability Questionnaire
- VAS at rest and while active.

Interventions

Group A-

Manipulation with Exercises

After that the patient is asked to perform following Exercises.

1. Single Knee Stretch
 2. Knee Rotation-
 3. Bridging-
 4. Spinal Extension exercise/Cobra-
 5. Child's Pose Stretch
 6. Hamstring stretching.
- Glutei sets-

Patient was asked to lie on his/her back and tighten his/her buttocks as much as he/she can. Hold for 10 sec and repeat 8-10 times

Group B -

Traditional Physiotherapy Exercises

1. Single Knee to chest stretch
2. Prone on elbows into press-up
3. Lower trunk rotation
4. Hamstring Stretch
5. Bridging

Pre-test Measurements of the patients: All subjects are tested using pre-test measurements, which includes

calculation of spinal range of motion measurement, as per functional disability measurement using the Oswestry Low Back Pain Disability Questionnaire, and average VAS at rest and while active.

Post-test Measurements of the patients: All subjects are tested by using post-test measurements for improvement evaluation after last session of therapy during a four week treatment intervention course through selected therapies.

Data Analysis

Hip joint flexion

Pre-Post Comparison:

Table 1: Pre-post comparison

	Pre to Post comparison	Mean difference	Std. Deviation	Wilcoxon Test p-value
Group A	Right	-14.46667	5.86708	3.478e-11
	Left	-17.30000	6.17623	1.623E-11
Group B	Right	-12.63333	5.71637	1.235E-10
	Left	-14.81667	6.17949	2.90E-10

Since p-value for average scores when compared for Pre to Post of Flexion of Right side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group A. Since p-value for average scores when compared for Pre to Post of Flexion of Left side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group A. Since p-value for average scores when

compared for Pre to Post of Flexion of Right side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group B. Since p-value for average scores when compared for Pre to Post of Flexion of Left side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group B.

Hip joint extension

Pre-Post Comparison:

Table 2: Pre-post comparison

	Pre to Post comparison	Mean	Std. Deviation	Wilcoxon Test p-value
Group A	Right	-4.78333	2.42928	2.205E-11
	Left	-5.01667	2.22841	3.192E-11
Group B	Right	-4.00000	2.30695	1.235E-10
	Left	-4.15000	2.70483	2.903E-10

Since p-value for average scores when compared for Pre to Post of Extension of Right side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group A. Since p-value for average scores when compared for Pre to Post of Extension of Left side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group A. Since p-value for average

scores when compared for Pre to Post of Extension of Right side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group B. Since p-value for average scores when compared for Pre to Post of Extension of Left side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group B.

Abduction

Pre-Post Comparison:

Table 3: Pre-post comparison

	Pre to Post comparison	Mean	Std. Deviation	Wilcoxon Test p-value
Group A	Right	-11.11667	3.79604	1.599E-11
	Left	-10.88333	2.96929	1.514E-11
Group B	Right	-9.36667	5.12543	3.958E-11
	Left	-7.76667	6.01232	1.728E-09

Since p-value for average scores when compared for Pre to Post of Abduction of Right side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group A. Since p-value for average scores when compared for Pre to Post of Abduction of Left side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group A. Since p-value for average

scores when compared for Pre to Post of Abduction of Right side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group B. Since p-value for average scores when compared for Pre to Post of Abduction of Left side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group B.

Adduction

Pre-Post Comparison:

Table 4: Pre-Post comparison

	Pre to Post comparison	Mean	Std. Deviation	Wilcoxon Test p-value
Group A	Right	-2.90000	1.51490	5.163e-12
	Left	-2.41667	.49717	3.263E-12
Group B	Right	-2.80000	1.47062	1.625e-11
	Left	-1.85000	2.23853	1.434E-07

Since p-value for average scores when compared for Pre to Post of Adduction of Right side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group A. Since p-value for average scores when compared for Pre to Post of Adduction of Left side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group A. Since p-value for average

scores when compared for Pre to Post of Adduction of Right side when compared using Wilcoxon Signed rank test is greater than that of 0.05 indicates no significance of change in from Pre-score to Post-Score in Group B. Since p-value for average scores when compared for Pre to Post of Adduction of Left side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group B.

External Rotation

Pre-Post Comparison:

Table 5: Pre-post comparison

	Pre to Post comparison	Mean	Std. Deviation	Wilcoxon Test p-value
Group A	Right	-7.28333	1.47397	1.26E-11
	Left	-6.88333	1.49680	1.32E-11
Group B	Right	-2.95000	1.50056	8.61E-11
	Left	-2.48333	1.42009	5.60E-11

Since p-value for average scores when compared for Pre to Post of **ER** of Right side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group A. Since p-value for average scores when compared for Pre to Post of **ER** of Left side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group A.

Since p-value for average scores when compared for Pre to Post of **ER** of Right side when compared using Wilcoxon Signed rank test is greater than that of 0.05 indicates no significance of change in from Pre-score to Post-Score in Group B. Since p-value for average scores when compared for Pre to Post of **ER** of Left side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group B.

Internal Rotation

Pre-Post Comparison:

Table 6:Pre-post comparison between Group A and Group B for internal rotation

	Pre to Post comparison	Mean	Std. Deviation	Wilcoxon Test p-value
Group A	Right	-0.25	0.54072	0.001496
	Left	0	0	NA
Group B	Right	-0.23333	0.42652	0.000211
	Left	-0.08333	0.27872	0.03689

Since p-value for average scores when compared for Pre to Post of **IR** of Right side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group A. No difference is observed for Pre to Post of **IR** of Left side and therefore no test is applied to test the significance in Group A. Since p-value for average scores when compared for Pre to

Post of **IR** of Right side when compared using Wilcoxon Signed rank test is greater than that of 0.05 indicates no significance of change in from Pre-score to Post-Score in Group B. Since p-value for average scores when compared for Pre to Post of **IR** of Left side when compared using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change in from Pre-score to Post-Score in Group B.

Oswestry Disability Index

Pre-Post Comparison:

Table 7:Pre-post comparison

	Group A	Group B
Z	-6.741	-6.744
p-value	.000	.000

Since p-value for average scores when compared for Pre to Post using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change from Pre-score to Post-Score in Group A. Since p-value for

average scores when compared for Pre to Post using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change from Pre-score to Post-Score in Group B.

Visual Analogue Scale (VAS) Score

Pre-Post Comparison:

Table 8: Pre-post comparison

	Group A	Group B
Z	-6.781	-6.832
p-value	.000	.000

Since p-value for average scores when compared for Pre to Post using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change from Pre-score to Post-Score in Group A. Since p-value for average scores when compared for Pre to Post using Wilcoxon Signed rank test is less than that of 0.05 indicates significance of change from Pre-score to Post-Score in Group B.

patients who are part of Group A i.e. where the selected 60 patients were given Sacro-iliac joint manipulation with exercises as compared to Group B where the selected 60 patients were given ROM exercises (Supine pelvic tilt).The study also concluded that there is a better improvement in extension of those patients who are part of Group A i.e. where the selected 60 patients were given Sacro-iliac joint manipulation with exercises as compared to Group B where the selected 60 patients were given ROM exercises (Supine pelvic tilt).The study further concluded that there is a better improvement in right lateral flexion and left lateral flexion of those patients who are part of Group A i.e. where the selected 60 patients were given Sacro-iliac joint manipulation with exercises as compared to Group B where the selected 60 patients were givenROM exercises (Supine pelvic tilt).In pre evaluation comparison it is concluded

Conclusion

The study concluded from the results that the overall improvement in low back pain is better in Group A i.e. where the selected 60 patients were given Sacro-iliac joint manipulation with exercises than the Group B where the selected 60 patients were given ROM exercises (Supine pelvic tilt).The study concluded that there is a better improvement in flexion of those

from the study that in flexion there is a significance of difference between Group A and Group B. The scores are better in Group B at pre evaluation. It is concluded from the study that in extension there is a significance of difference between Group A and Group B. The scores are better in Group B at pre evaluation. Study also concluded that there is no significance of difference between Group A and Group B in case of right lateral flexion. Whereas left lateral flexion it is concluded that there is a significance of difference between Group A and Group B. The scores are better in Group B at pre evaluation. In post evaluation comparison it is concluded from the study that in flexion there is no significance of difference between Group A and Group B. The scores are better in Group A at post evaluation. It is concluded from the study that in extension there is a significance of difference between Group A and Group B in post evaluation scores. The scores are better in Group A at post evaluation. Study also concluded that there is a significance of difference between Group A and Group B in case of right lateral flexion in post evaluation scores and the scores are better in Group A at post evaluation. Whereas left lateral flexion it is concluded that there is no significance of difference between Group A and Group B. The scores are better in Group B at post evaluation.

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