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Efficacy of Kinesio Taping and Pilate Exercises on Pain and Range of Motion in Lumbar Spondylosi

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Abstract : : low back pain is one of the most common health problems in different communities of the world. The objective of this study was to investigate the effect of the pilate exercise and kinesio taping on pain and range of motion in the lumbar spondylotic patient. For this purpose, 60 female subjects with lumbar spondylosis, with age range from 45 - 65 years, and the body mass index should be less than 35 participated in this study, they were randomly assigned in two equal groups. Group A:Received kinesio taping for four weeks and was changed once every week, Group B: Received pilate exercises program three times per week for four weeks. We used BROM instrument to measure the range of motion in lumbar spine and Visual Analogue Scale (VAS)to measure the intensity of the pain. The results of study indicated that there is significant effect of kinesio taping on pain and range of motion in lumber spondylotic patients.
Keywords: Kinesio taping, Pilate excercise, Lumber spondylosis.

Introduction

Lumbar spondylosis can be described as all degenerative conditions affecting the disks, vertebral bodies, and associated joints of the lumbar vertebrae. Within the literature, lumbar spondylosis encompasses numerous associated pathologies including spinal stenosis, degenerative spondylolisthesis, osteoarthritis and many others. It also captures effects of aging, effects secondary to trauma, "wear and tear," degenerative disease that involve the intervertebral discs, vertebrae, and associated joints**.** [1]The disease is said to be progressive and irreversible, mostly occurring in older patients. Exposure to mechanical stress, due to the loading of the spinal segments while standing and during spinal motion, causes the lumbar region to be the most affected region. When a patient suffers from lumbar spondylosis, osteophytes can form. These are bony overgrowths that occur due to the stripping of the periost from the vertebral body. The patient can also experience joint stiffness, which can limit motion. [2]

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Experimental

Sixty patients diagnosed as lumbar spondylosis at the level of L3-L5 participated in this study. Their mean age was 45-65 years, and body mass index less than 35.

They were randomly distributed into two groups. Each groups consisted of 30 patients and there was no significant difference between the two groups(age, hight, weight) ,there are randomly selected and divided into equal group.

Group(A) : Received KT applied for four weeks and was changed once every week. Three times per week for four weeks as a home exercises program.

Group (B):Received pilate exercises program three times per week for four weeks.

Evaluated Procedures

Patients were assessed just before and after 4 weeks of treatment. The assessment procedure included the following items.

- Pain assessment and range of motion assessment Pain was assessed byVisual Analogue Scale (VAS). It consisted of a horizontal line of 10 cm long, with anchors at either ends. The first anchor represents no pain while the last anchor represents pain as bad as it could possibly be. The patient was asked to place a mark through the line at the point that best describes how much pain was experienced. The measurement was taken as the distance from the zero end to the mark made by the patient Visual analogue scale would give a valid data for chronic pain. [3]

Range of motion assessment:

The BROM II (Back Range of Motion Instrument) measures range of motion of the lumbar and thoracic spine. The BROM II provides readings that can easily be produced by a second examiner. This procedure provides standardized protocol for four types of measurements: Flexion and Extension Measurements ,Pelvic Tilt , Rotation Measurements, Lateral Flexion Measurements.

Treatment procedure :

Taping procedure: Based on the work of Kase et al., 22 , H technique was used in the application of the Kinesiotape. The patient was positioned in a flexed spinal position. The therapist applied 2 longitudinal Kinesio tape strips parallel to the spine from the base of the sacroiliac joint region, or a minimum 2 inches below the point of pain to the inferior angle of the scapula with tension of 20-25%. The third strip is a space correction technique, which is applied over the region of the greatest pain with 100% tension. [4]They received the application of KT for four weeks and it was changed once every weak

Pilates based exercise

Participants completed one hour of a supervised (1:4 ratio) Pilates exercise twice per week for 6-weeks. Each session included a 10-minute warm-up concentrating on movements of the trunk musculature. Participants were taught to find lumbar spine neutral (LSN) as the intermediate position between retroversion and anteversion. Activation and control of the TrA and MF muscles was established with expiration during diaphragmatic breathing in different positions (standing, sitting, supine, prone and four-point kneeling) based on the Pilates technique. The exercise intervention included the following Pilates movements, spine stretch forward, spine twist, single leg stretch, rolling, the hundred, diamond press, side kick and shoulder bridge. Exercise intensity and duration was progressed in accordance with the ACSM guidelines for chronic low back pain.[5]

Result

Group A

A paired sample t test was applied to find the comparison of VAS no, VAS faces, Flexion, Extention, Lateral pending and Rotation before and after treatment of Group A. As shown, there was a significant increase in Flexion, Extention and Lateral pending RT and LT.

Paired Sample t-test

	Mean difference	**d.f**	**t-value**	**p-value**	**Result**
VAS No. before treatment-VAS No. after treatment	1.00	4	1.118	0.326	Not significant
VAS Faces before treatment-VAS Faces after treatment	0.60	4	2.449	0.070	Not significant
Flexion before treatment-Flexion after treatment	-1.20	4	-6.532	0.003	Significant increase
Extention before treatment- Extention after treatment	-1.70	4	-6.668	0.003	Significant increase
Lateral Pending RT before treatment-Lateral pending RT after treatment	-2.0	4	-3.65	0.022	Significant increase
Lateral Pending LT before treatment-Lateral pending LTafter treatment	-1.8	4	-3.087	0.037	Significant increase
Rotation RT before treatment-Rotation RT after treatment	-0.40	4	-1.633	0.178	Not significant
Rotation LT before treatment-Rotation LT after treatment	-0.20	4	-1.00	0.374	Not significant

Group B

RESULT: A paired sample t test was applied to find the comparison of VAS no, VAS faces, Flexion, Extention, Lateral pending and Rotation before and after treatment of Group B. As shown, there was a slight significant increase in Flexion, Extention and rotation RT.

Paired Sample t-test

	Mean difference	**d.f**	**t-value**	**p-value**	**Result**
VAS No. before treatment-VAS No. after treatment	1.20	4	6.000	0.004	Significant decrease
VAS Faces before treatment-VAS Faces after treatment	0.40	4	1.633	0.178	Not significant
Flexion before treatment-Flexion after treatment	-0.65	4	-5.099	0.007	Significant slightly increase
Extention before treatment- Extention after treatment	-0.50	4	-3.162	0.034	Significant slightly increase
Lateral Pending RT before treatment-Lateral pending RT after treatment	-1.2	4	-1.500	0.208	Not Significant
Lateral Pending LT before treatment-Lateral pending LT after treatment	-0.50	4	-2.236	0.089	Not Significant
Rotation RT before treatment-Rotation RT after treatment	-0.80	4	-4.000	0.016	Significant slightly increase
Rotation LT before treatment-Rotation LT after treatment	-0.60	4	-2.449	0.070	Not significant

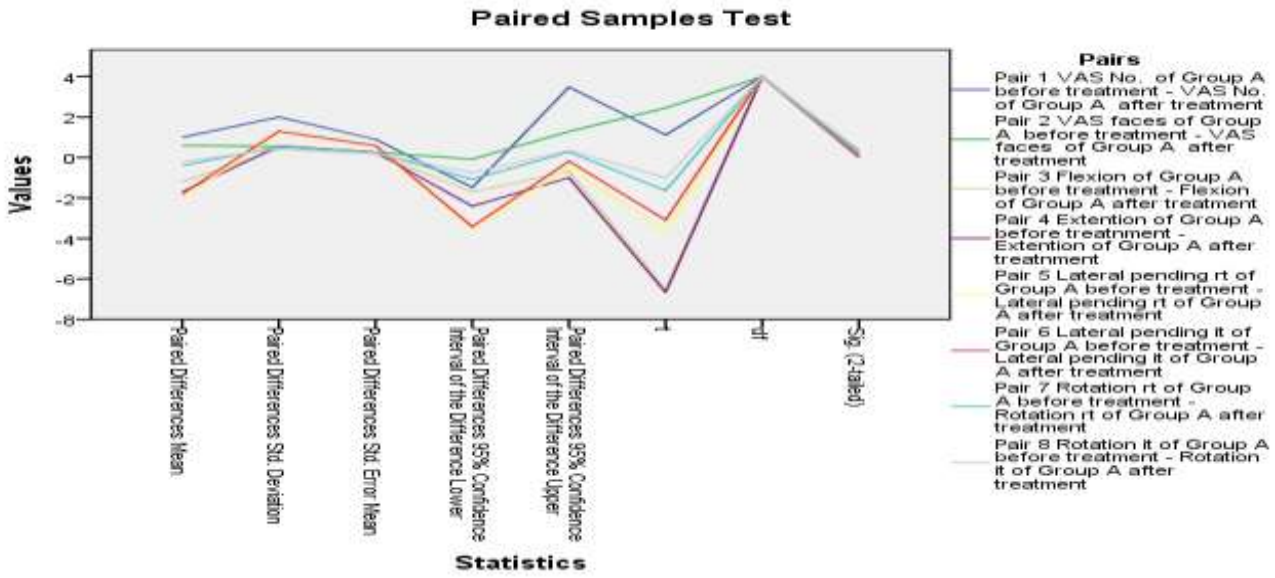

FIGURE below depicting Paired Sample t-test of comparison between between before treatment and after treatment of Group A

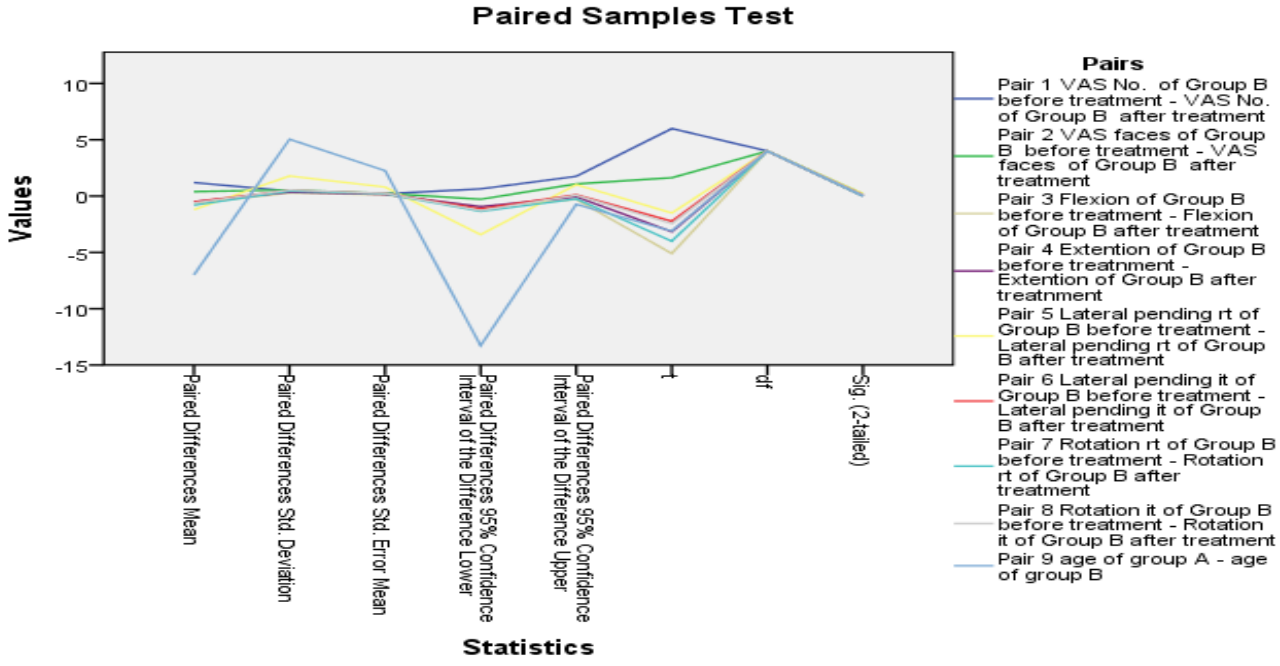

FIGURE below depicting Paired Sample t-test of comparison between between before treatment and after treatment of Group B

Comparison Of Group A and Group B

UnPaired T TEST

1. Comparison of Vas No. and Faces (Before and After Treatment) Between Group A and Group B

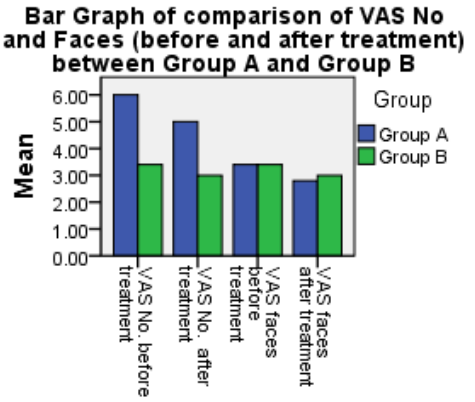

Fig 1

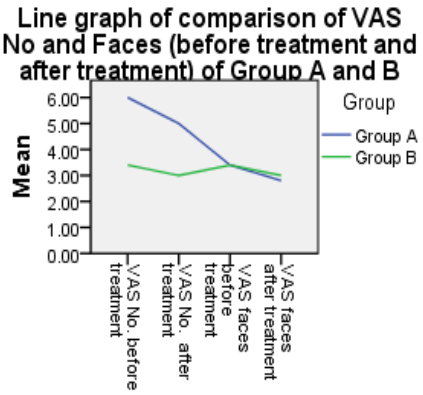

Fig 2

Fig 1 and Fig 2 are the graphs of comparison of VAS No. and Faces Between Group A and Group B.

2. Comparison of Flexion (Before and After Treatment) Between Group A and Group B:

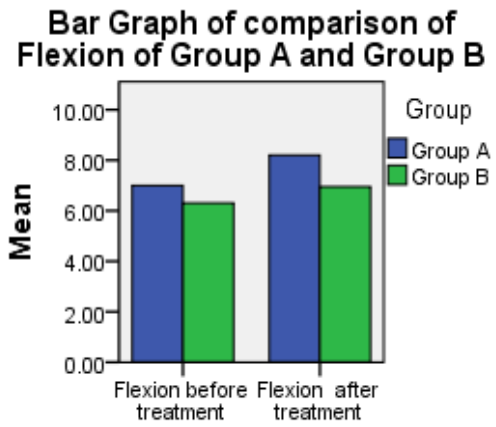

Fig 3

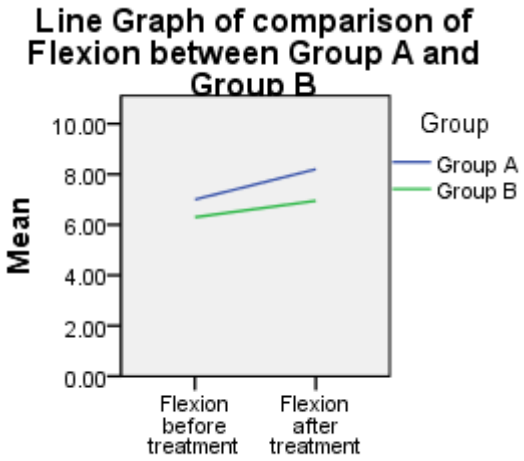

Fig 4

Fig 3 and Fig 4 are the graphs of comparison of Flexion Between Group A and Group B.

3. Comparison of Extention (Before and After Treatment) Between Group A and Group B:

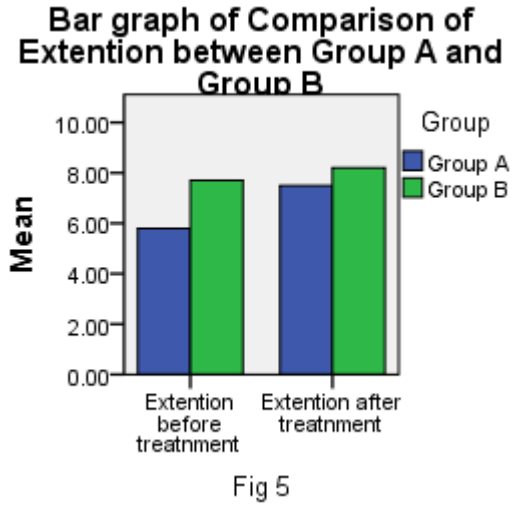

Fig 5

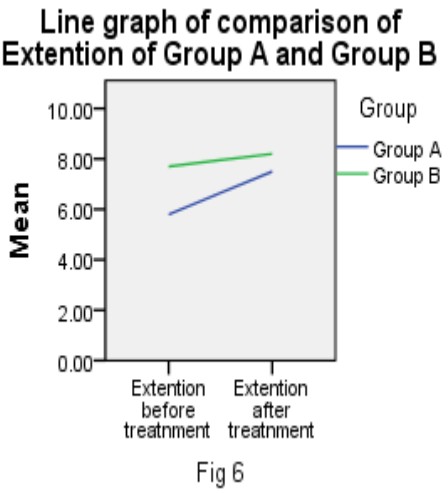

Fig 6

Fig 5 and Fig 6 are the graphs of comparison of Flexion Between Group A and Group B.

4. Comparison of Lateral Pending Rt, Lt (Before and After Treatment) Between Group A and Group B

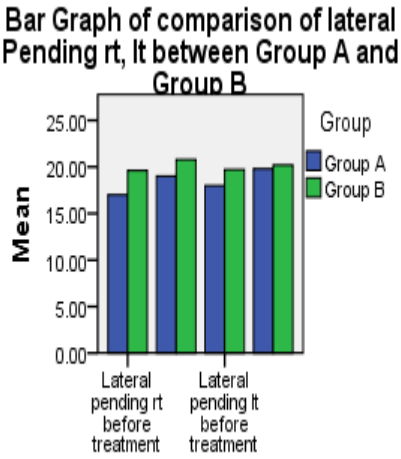

Fig 7

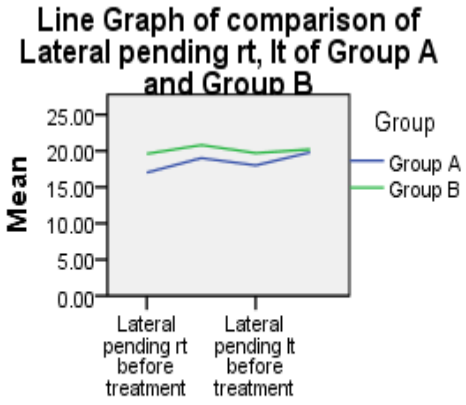

Fig 8

Fig 7 and Fig 8 are the graphs of comparison of Lateral pending RT, lt Between Group A and Group B.

5-Comparison of Rotation Rt, Lt (Before and After Treatment) Between Group A and Group B

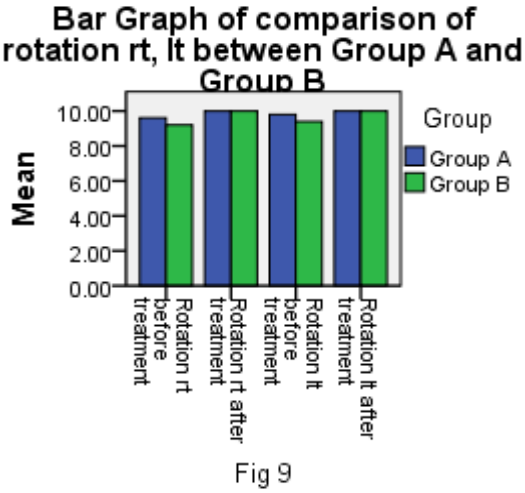

Fig 9

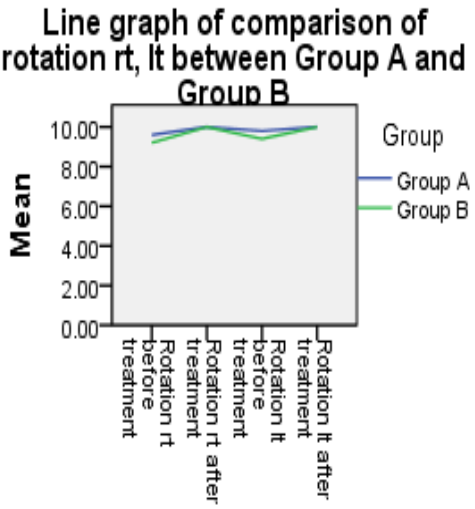

Fig 10

Fig 9 and Fig 10 are the graphs of comparison of rotation RT, lt Between Group A and Group B.

Discussion

It was found that mean of Visual Analog scale for pain- number and faces decreased after treatment of Group A. Before treatment the mean of VAS No was 6 and it decreased to 5, Flexion and Extention increased after treatment of Group A. Before treatment the mean of Flexion was 7 and it increased to 8.20. And the mean of Extention was 5.80 before treatment which increased to 7.50, Lateral pending RT increased after treatment of Group A. Before treatment the mean of Lateral pending RTwas 17 and it increased to 19. And the mean of Lateral pending LTwas 18 before treatment which increased to 19.80, Rotation RT increased after treatment of Group A. Before treatment the mean of rotation RTwas 9.60 and it increased to 10. And the mean of rotation LTwas 9.80 before treatment which was increased to 10, found that mean of Visual Analog scale for pain-number and faces decreased after treatment of Group B. Before treatment the mean of VAS No was 5 and it decreased to 3.80, Flexion and Extention increased after treatment of Group B. Before treatment the mean of Flexion was 6.30 and itwas increased to 6.95. And the mean of Extention was 7.70 before treatment which

increased to 8.20, Lateral pending RT increased after treatment of Group B. Before treatment the mean of Lateral pending RT was 19.60 and it increased to 20.80. And the mean of Lateral pending LT was 19.70 before treatment which increased to 20.20, of Rotation RT increased after treatment of Group B. Before treatment the mean of Rotation RTwas 9.20 and it increased to 10.00. And the mean of Rotation LTwas 9.40 before treatment which increased to 10.00.

Recently Pilates based exercises have been increasingly incorporated into physiotherapy rehabilitation programmes.[6] The Pilates technique focuses on the principles of centring, postural alignment, co-ordination, concentration, breathing, precision and movement sequencing.[7] These principles aim to allow dysfunctional movement to be isolated perfected then integrated back into functional movement[8] and teach control of spinal movement during activities of daily living.[9]

The results of the present investigation are in accordance with Taylor et al.[10] and Natour et al.[11] who observed improvements in pain and self-reported disability after 6 and 12-week Pilates interventions respectively. However in contrast to our study Natour et al.[11] measured functional disability using the Roland-Morris Disability Questionnaire which unlike the ODQ requires a response to all questions regardless of patient relevance

Improvements in the perception of functional disability and pain as a result of the Pilates exercise may contribute to improvements in core muscle endurance and range of motion. CE improved post-intervention which is in accordance with the work of Natour et al.[11] who purported that Pilates improved core strength because of higher levels of TrA contraction. In addition Kamioka et al.[12]reported that there was strong evidence that in a healthy population Pilates exercise improved flexibility and enhanced muscular endurance in the short term.

Conclusion

From tables of group A: A paired sample t test is applied to find the comparison of VAS no, VAS faces, Flexion, Extention, Lateral pending and Rotation before and after treatment of Group A. There was a significant increase in Flexion, Extention and Lateral pending RT and LT.

From tables of group B: A paired sample t test is applied to find the comparison of VAS no, VAS faces, Flexion, Extention, Lateral pending and Rotation before and after treatment of Group B. There was a slight significant increase in Flexion, Extention and rotation RT.

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