



ORIGINAL RESEARCH PAPER

Physiotherapy

COMBINED ROLE OF CORE MUSCLE ACTIVATION AND PILATES ON REFORMER IN A GERIATRIC PATIENT WITH DEGENERATIVE LUMBAR SPONDYLOSIS AND L4-L5 PROLAPSED INTERVERTEBRAL DISC.

KEY WORDS: Core Muscle Activation, Geriatrics, Lumbar Spondylosis, Pilates, Prolapsed Intervertebral Disc

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ABSTRACT

The case report highlights the fact that core muscle activation with progressive limb loading and pilates on the reformer, even for an individual belonging to the geriatric age group, is very effective to cure low back pain. In patients belonging to geriatric population therapists prefer more of electrotherapeutic and conventional forms of physiotherapy. This case report discusses how we went about with a different outlook for the patient. Mrs K who belongs to the geriatric population, was diagnosed with Degenerative Lumbar Spondylosis with L4-L5 Prolapsed Intervertebral Disc. She had pain in performing activities of daily living, had antalgic gait and a lot of apprehension due to difficulty of participation in the daily activities and recreational ventures. After assessing her in detail, she was begun on a core muscle activation exercise program, which initially was in the unloaded position, thereafter with progressive limb loading. She was subsequently progressed on the pilates reformer machine. Within 3 weeks of her physiotherapy treatment she was able to do her activities without pain and resume her social activities as well. Her quality of life improved. Thus we conclude that core muscle activation and pilates reformer does show good results even in the geriatric population who have good cognition and must be used by therapists to treat patients belonging to that age group.

INTRODUCTION:

Low back pain due to lumbar spondylosis and disc bulges are common in the geriatric age group. Here the therapists normally stick to a more electrotherapy based management and conventional physiotherapeutic exercises because they consider it to be easier for geriatric patients to remember and understand. But if the patient is cognitively good and pro exercise we must inculcate good core muscle activation which can be progressed to tailor made mat pilates and reformer exercise program, if it is indicated in the patient.

PATIENT INFORMATION:

Mrs K, 69 year old female, a housewife and a fitness enthusiast, came to the physiotherapy department of a multispeciality hospital with severe low back pain with pain referring to the buttocks and heaviness in bilateral lower limbs. She noted that the pain started after she suddenly bent her back to lift an object from the ground and it aggravated further when she performed certain unsupervised exercises including extreme stretch postures after watching a video on the Internet. The aggravating factors were bending from lower back, lifting weights, pushing or pulling objects. Even 10 meters of walk would lead to pain at the back of her thigh despite wearing the lumbar brace for support. Her relieving factors were lying supine.

CLINICAL AND DIAGNOSTIC INFORMATION

After 2 weeks of bedrest, as recommended by her homeopathic consultant, she came to the physiotherapy department. The outcome measures taken were pain scale, that is VAS, which she rated as 2/10 at rest and 7/10 on activity. The Becks Depression Inventory score pointed towards mild depression. The Oswestry score revealed moderate disability. Her participation restrictions included social gatherings and recreational activities like kitty parties and group yoga sessions.

A thorough assessment was conducted. On observation, in standing, patient had a kypholordotic posture. There was a waddling gait and the Trendlenburgs sign was positive. Observation of the lumbar active movements revealed that there was a lumbar hypomobility (confirmed by Schober test) and a hypermobility at the hip joint and thorax compensating for the same, when the lumbar flexion, extension, side flexion

and rotation movements were actively performed by the patient. Transitions from one position to other took longer.

Radiographically, patient presented with intervertebral disc space reductions in L3-S1 segments, with loss of upper lumbar lordosis and exaggerated lumbo sacral angle. Also there was a diffuse disc bulge at L4-5 level. Pain and reduction in disc spaces may have led to the reduction in lumbar range.

On palpation, there was tenderness in the right gluteal region extending from L5 vertebrae. Straight leg raise and Fabers test were performed which were negative. Arthrokinematics were reduced at the lumbar and lumbosacral region and the muscle tone felt flabby. There was mild tightness in Gastrocnemius, Hamstrings and Pyriformis.

THERAPEUTIC INTERVENTIONS WITH DISCUSSION

Patient was educated regarding the ergonomics she needed to take care of. She was advised to sit with her back supported on a firm chair and to avoid sitting on floor. She was asked to avoid lifting heavy loads and explained the right lifting mechanics if she really needed to lift any object.

The treatment was started in an unloaded position and there after progressed to limb loaded position. [1] First the muscle length (tightnesses) and intersegmental control was targeted which once achieved was progressed to improving strength and endurance.

It started with targeting the muscles of the lumbar corset which is responsible for the local stabilizer function and controlling the intersegmental control of the spinal vertebrae. The transversus abdominis activation, pelvic floor activation, multifidus activation and deep glutei activation were begun with, followed by exercises to improve the control of quadriceps and hamstrings and reducing tensor fascia lata overactivity. The function of the hip extensors and the gluteus maximus is known to be a key role in the stability and control of the lumbar-pelvic region. [2,3] She was simultaneously given electrical muscle stimulation to her erector spinae which primarily act as stabilizers of the back, to improve the recruitment pattern of its motor units and thus the intersegmental control due to normalization of firing pattern. [4] Patient followed up daily for one week thereafter

alternate days. Thereafter she was taught activation of gluteus medius muscle.

She was then progressed to standing exercises which included mini squats to improve glutei, quadriceps and gastrocnemius control. Lunges were then added along with weight shift and weight transference exercises. Standing hip abductor, extensor and flexor strengthening were also included. As a home program she was doing the above exercises which were further progressed with use of therabands and 1 kg weight cuffs.

Patient was further progressed on the pilates reformer. Pilates approach to improve posture and control movement can thus be supported within a theoretical context of neuromuscular control which builds upon the concept of stability about a local spinal segment.[5] Centering on core and spine muscles, concentration, precision, control, breathing and flow were the key principles followed.[4] We worked on the core muscles, calf muscles, quadriceps, hamstrings, glutei, rectus abdominis, obliques, arm muscles, shoulder girdle muscles and trunk rotators. Breathing was coordinated with the movements. Initially exercises were done with one heavy spring and one light spring. Once substantial control was obtained resistance was progressed to two heavy springs and one light spring. All the exercises shown in Figure 1 were given to her and progressed gradually with ample active rest periods. Within three weeks of physiotherapy, patient rated her VAS at rest as 0/10 and rated exhausting activity as 1/10. The waddling gait had reduced considerably. The gait speed and control improved drastically. The Becks depression inventory score now showed no depression possibly due to good endogenous endorphin release post the exercises on reformer. Oswestry scale showed no disability. There was improvement in the quality of life and patient was successfully able to get back to her social and recreational activities and also gradually weaned off her lumbar brace. She claimed to have felt stronger and happier.

Thus we conclude that core muscle exercises and mat and reformer pilates exercises work considerably well even in the geriatric population and must be considered by therapists as a choice of treatment of low back pain if the patient is cooperative and cognitively good.



Figure 1. Exercises done by the patient on the reformer.[6]

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