

CORE MUSCLES STRENGTHENING ON A GERIATRIC SUBJECT WITH SCIATICA AND HAMSTRING TIGHTNESS – EVIDENCE BASED CASE STUDY

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ABSTRACT

Introduction: Sciatica along with lowback pain can be crippling with pain and associated disability. Independent life style among geriatric subjects largely influenced by musculoskeletal changes including hamstring tightness, lowback ache, sciatica and knee pain. **Aims & Objectives** of this study was to 1. Analyse efficacy of core strengthening exercises on this subject with sciatica and hamstring tightness. 2. To evaluate her functional outcome **Materials & Methodology:** This 71 year old female with sciatica, hamstring tightness and knee pain was treated with core strengthening exercises, hamstring stretching and strengthening of knee muscles. With weekly twice frequency during the period from May 2017 to June 2017.

Results: Pre and post Oswestry and womac functional rating scale were statistically analysed. With womac score ($P<.05$) and Oswestry functional scale ($P<.05$) showing statistically significant results. **Conclusion:** with an increasing geriatric population and the duty of scientific community to provide them good quality of life is paramount. The findings of this study strongly evidence the concept of high quality health care for geriatric subjects with musculoskeletal problems.

KEYWORDS: Hamstring tightness, lowback ache, sciatica and knee pain.

INTRODUCTION

1. An increasing geriatric population in recent years and increase of life expectancy among this group, diagnosis, preventive means and prognosis of their difficulties are of at most

importance in enhancing their quality of life with care and sensitivity to resolving their needs and difficulties (Bize et al 2007). Muscle atrophy, determination of endurance capacity and muscle weakness during ageing process all lead to decrease of physical activity and consequently to diseases (Guralink et al 1994).

2. Physical inactivity is a modifiable risk factor for cardiovascular disease and a widening variety of chronic diseases, bone and joint diseases (Osteoporosis and Osteoarthritis) and depression (Lee and Skerett et al 2001).
3. Sciatica is characterized by radiology pain in an area of the leg typically served by one nerve not in the lumbar or sacral spine, sometimes also associated with sensory and motor deficits (Wilco peul 2007 & Cherkin et al 1994). It has direct and indirect costs (Val Tuder et al 1995) and with 1.5 million disk surgeries annually worldwide (Fry Moyer et al 1988).
4. USA has the highest rate of spinal surgery (5 times that of Great Britain (Deyo et al 2001) but studies comparing surgical and conservative treatment for back pain among 280 patients in a 10 year follow up found no appreciable differences in outcome were found (Arya 2014).
5. Therasa 2004 has reported that by effectively improving physiological weakness such as poor balance, muscle weakness, with physical training can improve quality of life, increase independency in elderly people and control various complications of old age (Mac Rae et al 1996).
6. Evidence suggests resistance and Flexibility exercises performed twice a week to maintain functional status promote lifelong physical activity and enhance overall quality of life (Blair et al 2001).

Aims and objectives of this original research study was a) to analyse the efficacy of core strengthening exercises on sciatica b) to evaluate functional outcome on subjects quality of life with Oswestry and WOMAC scale.

MATERIALS AND METHODOLOGY

Past medical history of this 71 year old female subject with known type II diabetic subject for twenty years on insulin (Therapy 16 units of human mixtard) and T. Glycophage C/O.

Left lowback, hip knee pain and difficulty in walking graduate, vegetarian mother of two children living with husband alone in an independent house in a metro city.

Anthropometric MeasurementsBMI: 24 Kg/m²

Heart Rate: 68/mt

WC: 92 cm

O/E

- Bilateral genu varum
- Varicosities recorded mild degree on both lower extremities
- Tenderness grade II over, sacroiliac (Left), Lumbosacral Junction and Left Knee Medial Joint Line II Grade
- Dorsal oedema of feet grade II
- ROM (Range of Motion)
- Hip – Extreme ranges painful and restricted

Knee – 0⁰-12⁰ (Right) 5⁰-110⁰ Flexion (Active Range) (Left)

Ankle –NAD

Spine – Moderate as pain prevents from full evaluation

Both Upper Extremities: Range of motion and motor power nil deficit

- Vastus medial's lag bilateral
- Abdominal muscles – II/ V, Bilateral hip abductors, extensors and knee muscles 3/5
- Gait ambulant unaided with antalgic gait with lumbar list to right
- Independent for self care, but standing for more than 5 minutes painful, also walking she was unsteady with pain and fear of falling
- Balance in standing – moderate as able to stand with finger support for few seconds
- Pain increasing on activities increasing at Lumbosacral region. Also radiates posteriroly up to knee joint
- Bilateral hamstring tightness, patella femoral glide painful (Left)
- Exaggerated lumbar lordosis and mild wasting of hamstrings and gluteus maximus of left

Treatment Given

1. Alignment correction exercises using pillows and Physioball
2. Core strengthening exercises
3. Strengthening of hip and joint muscles
4. Home programme with ironman posture, pelvic bridging, quadriceps exercises, balance exercises in standing and walking for short distance along with hotpac application as and when pain arises.

Duration: 25- 30 minutes, Frequency: Weekly Twice, Total Number of Sessions: 8 Sessions.

RESULTS

Table 1: of results of paired 't' test of pre and post Oswestry and womac scale of the subject.

Test	Womac Score	Oswestry Score
Pre	81	51
Post	40	35
SD	29	11.31
SE	5.38	3.36
t	7.62	4.17
P	<.01	<.01

Subjective Womac Score: 24 items on a 5 point scale related to functioning of knee
 Subjective Oswestry Score on 9 items on a 6 point scale related to lowback functional SD – Standard Deviation, SE – Standard Error, P- Level of Significance.

Table 2: Clinical Prognosis of the Subject.

Session	Nature of Exercises Used	Post RX Clinical and Subjective Findings	Sets and Repetitions	Duration	Frequency
I	1. Isometric contraction in of abdominal muscles in crook lying 2. Hamstring stretching in supine, side lying Active spinal extension on fore arm in prone position 3. Side lying hip abductors prone hip extensors active resisted exercises	1. Moderate difference in antalgic gait Pain at lowback had decreased from VAS 8 to 5 Hamstring tightness has decreased	6 sets 3 repetition	20 minutes	Twice a Week
II	Added with above exercises: 1. Supine pelvic bridging with Physioball Side plant with folded pillow between thighs Prone with folded pillow between thighs and squeezing the same	1. Level of confidence has increased Pain has decreased on VAS from 5 to 3 Partial self care activities she has begun	9 sets 5 repetition	30 minutes	
III	Along with I +II Closed kinematic exercises with feet on ball, pelvic bridging Pushing against the ball for isometric hamstring, abdominal contractions Side lying ball in between thigh – plank exercises	1. Lower back pain has considerably SLR has become pain free Self care she has fully resumed	12 sets 8 repetition	35 minutes	
IV	With I + II + III Prone position with stomach resting on the ball glutens maximums, hamstring strengthening Spiral extension	1. Walking has become near normal Able to sit for more than few hours	15 sets 10 repetition	40 minutes	
V	Along with I, II, III +IV with support in holding standing posture, manual resistance for hip and knee movements and Home programme	1. Able to resume work 2. Functional activities have improved Pain has largely decreased few second holding each exercises	18 sets 5 repetition	45 minutes	

Clinical Prognosis Noted Includes

1. Reduction in pain over lumbar, sacroiliac areas following therapy the subjects movements, physical activities have improved
2. She was able to walk with improved cadence gait, pain free and stable for short distance in closed environment
3. She was confident as evidenced with improved participation in social activities
4. Started walking continuously with monitoring for 15-20 minutes

DISCUSSION

The critical questions to be answered scientifically in this research outcome with evidenced approach were discussed as below:

1. Does sciatica among elderly be treated conservatively with exercises?

Surgical discectomy may be considered for patients with sciatic, who do not respond to initial conservative management but the role of surgery for chronic lowback ache is under debate (Fritzel et al 2001).

RCT have recorded matched treatment for patients with lowback ache had significant functional outcomes than unmatched treatment and with Weight bearing exercise, especially resistance exercise, appears to have the greatest effects on bone mineral density (Warburton et al 2001). Prevents bone loss associated with aging (Baron et al 2002).

Resistance training have greater benefits for glycemic control (Dunstan et al 2005) as the subject benefits from being a chronic diabetic.

2. How much progression on genu varum be achieved?

Genu varum, hamstring tightness, hyper lumbar lordosis Sharma et al 2002 have recorded 50% subjects with low back ache had hamstring tightness, tight hamstrings with maladaptive positive strategies (Marshall 2009) and probable indirect involvement in the pathogenesis of lowback pain which were of clinical significance with prevention and treatment of lowback ache (Carregaro 2009). Hamstring tightness could lead to an increased patella femoral compressive force, which may eventually lead to an increased patella femoral compressive force, which may eventually lead to patella femoral syndrome often associated with osteoarthritis (Turner 1994).

However (Koley and Lidhi 2011) have among 102 subjects of both sex with lowback ache in Punjab India, based study have revealed no relation between lowback pain and hamstring flexibility.

3. What type of exercises to be prescribed?

Treatments for Low Back Ache

Evidence with NSAID and muscle relaxants shows strong evidence, but with side effects. Also strong evidence shows bed rest and specific back exercises are not effective moderate evidence, shows that spinal manipulation, multidisciplinary treatment are effective for sub acute pain relief. Lowback ache, sciatica, geriatric, prevalence, cost surgery, core, knee and lowback ache, RX, exercises. However no evidence shows effectiveness of lumbar supports, traction, massage or acupuncture in sub acute lowback ache (Van Tucker & Koes 2000).

4. What was the functional impact on quality of life of this subject following this specific therapy?

Functional impact on QOL

Among elderly populations regular physical activity can lead to reduction in risk factors for chronic diseases and disability (ACSM 1998) and routine physical activity can improve musculoskeletal fitness (Warburton & Gledhill 2001) along with an improvement in overall health status, eliminating the onset of disability, dependence mobility, bone health, glucose homeostasis psychological well being and overall quality of life (Katz Marzyk 2004 & Craig 2002). This study subject in line with these studies has recorded highly improved quality of life as displayed in the table of results 1.

5. Are core strengthening effective among geriatric subjects?

Core & Exercises on Geriatrics

Spinal stabilization exercises have been shown to decrease pain, disability and risk of recurrence after a first episode of back pain (Hides et al 2001). As core stabilization training put much stress on lumbar and abdominal muscles, these training has improved balance, strength of muscles as well the coordination in these muscles (Sonya et al 2009) Rodrigue et al 2010 increases, with pilates among elderly females recorded with an improved quality of life than those performed with no assistive devices. As shown in the clinical prognosis this study subject has benefited both knee and lowback region as evidenced with her life improved overall quality of life outcome with specific exercises she was treated with.

Critical Appraisal on this Study

With pain and inability to move around the subject has used self medication with anti inflammatory and analgesic drugs, developed in six months with an elevated urea to 75 and creatinine to 2.5 and getting treated by nephrologists prior coming to physiotherapy. Reasonable clinical prognosis could be attributed to subject's adherence to therapy, involvement in home programme and being non –obese.

Limitations of this original research was conducted but follow up is getting continued, only clinical and subjective ratings were used as tools of outcome of therapy. Further studies with larger sample size of both sex, to include more variables and compare other therapy modalities.

The author declares no financial conflict with any regarding publication of this research.

CONCLUSION

Lowback pain is debilitating on self care for physical and social activities especially among geriatric subjects. Low back pain with sciatica can result in atrophy of posterior thigh, gluteus maximums subsequently altering the normal mechanics movements of peripheral joints and spine. Hence early intervention as soon as the patient is stable with due corrective means of exercises be advocated for enhancing a good quality and dignified life of the senior citizens and not do accept their suffering as part of ageing which may increase level of depending and disability. The author has no conflict of financial or any other interest with publication of this original research study.

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