

# An Evidenced Study of Pelvic Tilt Based Exercises in Lumbar Disc Degeneration

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**Abstract:** Lowback pain remain a common clinical entity. Biomechanical evaluation and suitable exercises with evidence in lowback pain rehabilitation are not much studied. Aims & Objectives of this original research was to study the influence of pelvic tilt and exercises in low back pain subject with lumbar disc degeneration Materials & Methodology: This study was conducted between 30.10.2018 to 25.11.2018 in Chennai. Male subject with lumbar disc degeneration of 37 years was evaluated and treated with suitable corrective exercises based on pelvic tilt. He was treated with a thrice a week frequency for 10 sessions. Results: This pre and post Oswestry scale were statistically analysed with  $P < .001$  Conclusion: Rehabilitation with biochemical based means are shown to be more effective among subjects with lumbar degeneration.

**Keywords:** Oswestry Scale, CLBP – Chronic Lowback Ache, SLR – Straight Leg Raising, APT – Anterior Pelvic Tilt

## 1. Introduction

Chronic lowback pain, (Lowback pain which persists for more than 12 weeks) is the most frequently reported clinical symptoms of orthopaedic diseases than 50% of people in the US are affected by CLBP (Lawrence et al 2006) and it is the primary cause of work absence and permanent disability (Aluko et al 2013)

The traditional approach to lowback ache has failed as an effective treatment for subjects with chronic lowback ache are recent researches are suggestive of patient – centered approach to lowback pain (Osullivan et al 2012).

## 2. Background Information

37 year old male with chronic lowback ache was multiple disc lesions of lumbar as revealed in NMRI  
SLR – 65° with increasing pain down both hamstrings

Ambulant unaided, mesomorph, employed where frequent lifting of heavy LPG cylinders are involved, restricted forward lumbar flexion, bilateral hamstring tightness, hip flexor tightness, obliterated lumbar lordosis pain increasing while long sitting and his daily activities

### Why pelvic tilt exercises in lowback ache?

Lower lumbar lordosis plays an important role in sagittal alignment and balance (Jang et al 2007) flat back posture decreases lumbar lordosis of the spine (Sahrmann et al 2002) and this induces changes in spinal discs, creating abnormal pressures when absorbing shock between vertebrae, creating stress in spinal muscles tendon and ligaments (Jang et al 2007) flat back syndrome is characterized by forward inclination of the trunk, inability to stand upright and lowback pain (Wiggins et al 2003). Hence the exercises for flat back syndrome includes trunk backward extension and pelvic anterior tilt exercises (Neuman et al 2009). This original research strives to analyse stretching and strengthening exercises of muscles related to anterior pelvic

tilt on a subject with chronic lumbar degeneration on his functional activities.

**Aims & Objectives** of this original research was to evaluate the efficacy of pelvic based exercises in a chronic lowback ache subject

## 3. Materials & Methodology

An experimental case control study design, this study subject with chronic lowback ache ethical committee and his consent were obtained. Duration of this study was between 30.10.2018 and 25.11.2018 was conducted in Chennai a Metropolitan city of India. Based on the evaluation hip flexors and knee flexors were stretched and strengthening of hip, knee and spine extensors, abdominal muscles were carried out in a progressive manner with an increase in number of repetition, exercises were done in side, supine, prone, sitting on the ball and standing at an intensity of 60-70% maximal heart rate. The frequency was twice a week each session lasting for 30-35 minutes. The clinical prognosis was evaluated using Oswestry scale by statistical means

## 4. Results

Table 1 showing results of pre and post Oswestry lowback pain score

Mean	SD	SE	t	p
Pre		4.6	9	<.001
Post	8			

Reduction from 60% severe to minimal 16% disability on Oswestry lowback pain disability scale of 10 items on a 5 point scale

## 5. Discussion

### Presenting along is the course of clinical prognosis:

- With initial 3 sessions not much of symptomatic relief could be achieved but from 4<sup>th</sup> session he and significant loss of pain reduction and able to carry his daily activities involving lifting of weights, frequent bending and turning activities of the spine with relative ease
- No electrotherapy modalities were used except hot pac application to lowback region when required
- Also its worthy to state no pharmacological means were used with in this period
- After a weeks time home programme with a set of exercises were included
- Lumbar forwarded flexion, has increased after two weeks session
- Hamstring tightness, hip flexor tightness have shown reduction with an increased extension of hip and knee
- Lowback ache has decreased adequately with an improved Oswestry scale
- Straight leg raising is non symptomatic up to 90<sup>0</sup> after 3 weeks of therapy (radicular symptoms recorded prior to starting with SLR at 65<sup>0</sup>)

However to continue the progress he is adviced and attending weekly once session for further rehabilitation. He had mobile upper thoracic kyphosis for which he is continuing the treatment with physical means.

- 1) Strengthening exercises for anterior pelvic tilt includes erector spinae, ilipsoas and rectus femories (Neuman etal 2009) and a similar 37 year old male Korean subject with chronic lowback pain was treated with strengthening exercises of the above three muscles for two weeks resisted exercises of 3 sets of 30 repetitions daily has recorded an increased lumbar ROM, decreased lowback pain (Yoo 2013). **This research presentation goes well with the above study with the age, sex, complaints, evaluation and therapy outcome.**
- 2) Minicozzi etal 2016 have reported among 46 lowback ache subjects (With pelvic tilt exercise) that patients experiencing pain increase may have a poorer pre care status than patients with a decreased pain response pelvic tilt maneuver is performed with the patient supine. Hips are flexed to 45<sup>0</sup>, knees flexed to 90<sup>0</sup>, the patient is then flatten the lumbar spine without raising their buttocks of (Liebenson & Oslance 1996) and involves a degree of lumbar flexion and a reduction of lordosis (Levine & Whittle etal 1996)
- 3) It gives relief of lowback pain and involves contraction of abdominal muscles (Workman etal 2008). Shin etal 2015 combined pelvic anterior posterior exercises on a gym ball
  - Ludwing etal 2016 has among 54 male adolescents with an increased pelvic angle >14<sup>0</sup>, resistance training of hamstring, rectus abdominis and gluteus maximums in a 12 week period with reducing A.P.T. Due to muscular imbalance the pelvis tilts forward and lumbar lordosis increases. When the thoracic spine compensates for this mal position, an increased thorocal khyphosis and a typical postural weakness develop. Strength and stretch exercises as proven therapeutic interventions for the involved muscle

groups (Page etal 2012) and targeted strength programs for the muscle groups that reduce pelvic tilt in an improvement of posture in subjects with anterior pelvic tilt (Klee etal 1994)

- An increased APT, a key cause of hyper lordosis of the lumbar spine. Which is a typical characteristic of a poor posture with negative health implications (Smith etal 2008 & Jentzch etal 2013)

**This study subject who had thoracic kyphosis was treated with strengthening of spinal extensors at thoracic and cervical spine as line with above reports by page 2006;**

## 6. Conclusion

Biomechanical based evaluation and treatment of a lumbar pain subject with biomechanical concepts including pelvic tilt, motor weakness, soft tissue tightness should be aimed at patient centric approach and maximise early rehabilitation instead of following conventional usage of electronic traction, electrotherapy modalities for analgesic effect. As this approach using biomechanical means aims at cause to be treated and not the symptoms, physiotherapists clinical reasoning and selection of therapy based on patient specific problems in line with evidenced practice improves professional standard.

**Limitations** of this presentation was case study experimental design and of short duration, qualitative outcome measures were not used. However the study can be validated with larger sample size and RCTS

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