



Multiple Lumbar Disc Dehydration and Lumbar Degenerative Disorders- Can Exercises Be Effective?

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ABSTRACT

With invent of technology in physical activities, changes in life style leads to musculoskeletal ailments. Changes including neck pain and LBA are commonly reported among youngsters. Non pharmacological interventions using patient specific rehabilitation are less evidenced for lowback ache disc dehydration and multiple disc lesions. **Aims & Objective** of this research was to evaluate the efficacy of evaluation based exercises among LBA with multiple lumbar disc lesion. **Materials & Methodology:** 26 year old married research scholar with chronic LBA with acute lumbar disc lesion and dehydration was evaluated and treated with exercises based on her biomechanical problems. With a frequency of thrice a week for 10 sessions using hot pac and specific supervised exercises in Chennai from April 2019 to May 2019 **Results:** Pre and post Oswestry index were analyzed statically ($P<.05$) along with her clinical prognosis **Conclusion:** Patient centric modalities were more effective than symptom based therapy in early rehabilitation of back pain subjects, using biomechanical evaluation and suitable physiotherapy techniques were key projections of this research.

Keywords: CRP - C Reactive Protein , HLAB27 - Human Leucocyte Antigen B27, Oswestry Disability Scale, VD3- Vitamin D3, SLR - Straight Leg Raising, LBA - Lowback Ache, ADL- Activities of Daily Living.

INTRODUCTION

LBP (Lowback Pain) is a global health care concern causing more disability than any other medical condition (Hoy et al 2010). In the diagnosis and treatment of midline lowback pain, degenerative disc must be the possible diagnosis (Micheal Hazz et al 2012), Involves huge costs from \$100-200 billion each year in U.S alone along with loss of productivity (Katz JN

etal 2006). Primary functions of IVD (Intervertebral Disc) is mechanical transmission of loads arising from body weight and, muscle activity through the spinal column (Hayes et al 2001). Agrecan, major proteoglycan of the disc is responsible for maintaining tissue regulation (Urban & Roberts et al 2003). Maintaining extra cellular matrix is essential for a healthy normal

disc (Hutton et al 1999) with bio chemical modification that occurs with disc degeneration is the degradation of aggrecan resulting in the loss of proteoglycans and tissue hydration, which results in the loss of glycosaminoglycans, which in turn result in decrease of osmotic pressure of the disc matrix, in the degraded state, because of the lack of hydration, the discs load bearing function is altered (Urban & Roberts et al 2003). Consequently degenerated discs have less disc height and aberrant mechanical responses to loading, with changes in tissue integrity, neural in growth of disc and increased vascular can became a source of peripheral neuropathy producing pain, weakness and numbness due to nerve damage (Raj et al 2008)

Lumbar fusion surgery is widely used to treat degenerative lumbar diseases such as instability or stenosis (Bono et al 2009)

Along with decompression, stabilization and fusion leads to improved patient outcome (Kaner et al 2013). Rigid internal fixation and fusion can also increase incidence of adjacent segment disease, where dynamic systems can prevent adjacent segment pathology by preserving physiological movements (Ozer et al 2010). Several clinical studies have suggested that DSS (Dynamic Stabilization Surgery) can prevent progression of degeneration compared with discectomy and decompression (Putzier et al 2005). Guehring et al 2006 & Kroebae et al 2005 among animals, improvements in disc health via external spinal instrumentation and compressive loads which could lead to IVD degeneration, with less researchers were available for physiotherapy among disc dehydration and multiple lumbar spine disc lesion this study gets more significant.

Keywords:

LBP – Lowback Pain, Disc Dehydration, IVDP – Inter Vertibral Disc Pressure, ADL – Activities of Daily Living, Oswestry Disability Scale, SLR – Straight Leg Raising

Background Information:

26 year old married female and research scholar with chronic lowback ache was complaining of difficulty in sitting for more than 10 minutes and LBA with her functional activities for 6 months. Since October 2018, NMRI in March 2019 revealed disc dehydration noted at L1-L2, L2-L3, L4-, 45 level disc bulge at L4-L5 and L5- S1 level with bilateral neural foraminal narrowing and ventral medial indentation

Her CRP and HLAB 27 were negative, but VD3 was low at 10ng, was treated with supplements her physical condition as on 5th April 2019 was

1. SLR - 40° increases lumbar pain (Right) Left 60° increases lumbar pain
2. Bilateral hamstring tightness
3. Tender grade III at lumbo sacral region
4. Ambulant with mild hand support for short distance
5. Obliterated lumbar lordosis with mild mobile thoracic kyphosis
6. Weak core muscles
7. Transfers in bed, other activities of ADL independent partially
8. Ankle and knee jerks ++
9. Sitting increases pain with walking moderate pain for short duration, lying no pain was recorded

Aims & Objectives of this original research on a subject with (Non Pharmacologic intervention using specific physiotherapy) lumbar disc dehydration, multiple disc lesion and its impact on QOL

Materials & Methodology:

26 years old female with chronic LBA and multiple disc lesion was treated with hot pac and core strengthening exercises progressed gradually in a period of ten sessions. She was rehabilitated from April to May 2019 with weekly thrice frequency of exercises, as displayed in table 1.

Table 1: Methodology, Clinical Prognosis and Results:

Schedule / Sessions	Activity	Outcome with Function
First and Second Sessions	1. Isometric abdominal contractions in crook lying 2. Unilateral lumbar stretch 3. Prone position. Spinal extension and unilateral gluteus maximus, hamstring	Mild reduction in pain, but still continent hot pacs but no lymbosacral belt were used throughout
3 rd and 4 th	4. Cat and camel exercises and 5. Pelvic bridging started with physioball in floor level	Moderate improvement with her walking and slight increase in her ADL
5 th	6. Pelvic stabilization in side lying	Started sitting for short duration with back rest for half an hour.
6 th	7. Reach Standing: Lower extremity exercises	Able to travel in two wheeler and started social activities
7 th	8. Sitting: Quadriceps, Hip abductors strengthening	Confidence level has increased and her activities were increased steadily
8 th	9. Number of repetitions and resistance were increased	
9 th	10. Core strengthening exercises were intensified with sitting on ball	Able to sit and work, travel for hours together with ease and comfort
10 th	11. Sitting on ball home programme were taught and decreased the frequency of sessions	

Major Functional Outcome:

Advised to report bimonthly for follow up and review till today, with patient's adherence she has restarted her scholarly activities with ease and confidence

Statistical Results:

Oswestry LBA disability scale, a subjective scoring of 10 items on a point scale was used

prior to beginning of the study and after ten sessions with hot pac and specific exercises alone.

The scores were statistically analyzed and to be discussed with evidence. Table 2 of results on Oswestry LBA disability scale using paired 't' test:

Mean		SD	SE	t	P
Pre	68	19	10.96	4.10	<.05
Post	69				

After first session she was able to appreciate mild pain reduction, but next few sessions slight apprehension with any activity could exacerbate her pain was noted, but with due explanation she got involved in the process of rehabilitation further.

Discussion:

- The inability of the degenerative disc to uniformly distribute a load can lead to pain and effects on anatomical spinal structures and may cause facet arthrosis, spinal stenosis, instability and severe disability over time (Urban et al 2003), studies have shown that Axial IVD distraction can induce extracellular matrix gene expression (Guehring et al 2006) and affect disc nutrition via fluid movement (Urban et al 2004) however axial distraction can only be achieved via stabilization systems, as subjects with segmental instability and disc herniation, along with Microdiscectomy, lumbar dynamic stabilization alone provides better prognosis (Yelmiz et al 2017)
- A degenerated disc cannot self-regenerate and long-term elevated or impaired intradiscal pressure prevents regeneration (Kasra et al 2003), however distraction or stabilization may provide suitable conditions for rehydration and regeneration (Cho et al 2010)
- Yilmaz et al 2017 among 59 subjects with painful disc using dynamic stabilization system claims to decelerate the degeneration process and appear to facilitate disc hydration. **Contrary to these studies this research subject was conservatively treated with non-pharmacological means, using specific exercises has functionally**

improved and able to sustain the progress with regular follow-ups, a key outcome of this presentation.

- Lumbar stabilization exercises (Jeong et al 2017) among 30 lumbar disc herniation subjects with 30/ minutes / day for thrice a week in 4 weeks with one group for center stabilization resistance and another group for 3 dimensional exercises, sacral angle using X-ray disc herniation index with NMRI and (Korean Oswestry Disability Index) KODI. Where lumbar stabilization subjects an improved mobility and stability of sacroiliac joint, improved proprioception and a positive effects on lumbar disc function recovery (Kaya et al 2012). **This research subject with lumbar disc dehydration and multiple disc lesions was treated with stabilization exercises and shown adequate functional recovery in line with above studies and as shown in results table 2**

Conclusion:

Conservative physiotherapy should apply biomechanical concepts to maximize patients rehabilitation among lowback subjects, failing which surgical intervention may super Code can hamper QOL of LBA subjects is evident as major outcome of this research. Further follow up with due adherence of the subject studied validate statistical findings and positive clinical prognosis.

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