



## A PROSPECTIVE STUDY OF HEALTH RELATED QUALITY OF LIFE BEFORE AND AFTER LUMBAR DISC SURGERY FOR HERNIATED LUMBAR DISC

### Orthopaedics

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### ABSTRACT

Back pain is now an international health issue of major significance. About 80% suffer from back pain at some time in their life. It is ranked as the most frequent cause of limitation of activity in people younger than 45 years. **Aims And Objectives:** To study the null hypothesis that there is no difference between the QOL of life of patients with lumbar disc herniation undergoing open discectomy, before and after surgery. **Materials and Methods:** 100 patients Patients of prolapsed lumbar intervertebral disc hospital who are undergoing elective discectomy for lumbar PIVD at single level Prospective study in the department of Orthopaedics, Katihar Medical College, Katihar from January 2019 – May 2020. All patients fulfilling the inclusion criteria and who voluntarily consented for the study were initially recruited for the study. Out of 100 patients, 15 patients were lost to follow up and 5 patients could not complete the required investigations. So the ultimate sample consisted of 80 patients. **Result:** Most of the patients presented with Low back pain with radiculopathy with insidious onset of symptoms for a period lesser than 6 months. Majority of the patients had herniated disc at the level of L4-L5. All the patients had evidence of degeneration of disc material in the form of loss of disc height more than 50% on MRI of LS spine **Conclusion:** The discectomy procedure not only relieves the pain symptom but also improves depression resulting from pain symptoms, functionality, general health and overall quality of life of patients.

### KEYWORDS

Back Pain, Herniated lumbar disc.

### INTRODUCTION:

Back pain is now an international health issue of major significance. About 80% suffer from back pain at some time in their life. It is ranked as the most frequent cause of limitation of activity in people younger than 45 years by the National Centre For Health Statistics. Only routine examinations, postoperative check ups and upper respiratory tract symptoms surpass back problems as a cause of office visits to physicians.<sup>1</sup> With a 12-month prevalence of 15–45%, a 12-month incidence of up to 20%, and a yearly recurrence rate of up to 60%, low back pain (LBP) is a major health problem. About 75–85% of all individuals will experience LBP at some time during their life (lifetime prevalence)<sup>2</sup> It is also an important cause of sickness absenteeism in our country, therefore finding the most appropriate treatment for it is prudent. Lumbar disc herniation is the most common cause of low back pain and L3-4 and L4-5 levels showed the greatest degree of disc degeneration.<sup>3,4</sup> Low back pain has a severe impact on the individual, families, and society. The annual incidence of prolapsed lumbar intervertebral disc is about 5–10%. Lumbar disc herniation is the pathologic condition for which spinal surgery is most often performed<sup>5</sup>. Discectomy is the frequently done procedure for prolapsed lumbar disc. Disc prolapse amounts for 5% of lower back disorders and is one of the most common causes for surgery<sup>5</sup>. Treatment for lumbar disc herniation can be conservative or surgical, and which one is effective is always controversial<sup>6</sup>. Choosing the best form of treatment has always posed a challenge to the treating physician. Popular forms of conservative treatment are physical therapy, epidural steroid injection, chiropractic, anti-inflammatory agents and opioid analgesics which are a lot cheaper and less invasive than surgical techniques.<sup>5</sup>

Surgery for herniation of a lumbar disc is the most common spinal operation. Surgery is currently the most effective and treatment of choice. Discectomy being the widely done procedure. Health-related quality of life (HRQOL) refers to those dimensions of life which may be affected by a disease and its treatment. The natural course of events after sciatic pain originating from lumbar disc herniation is most often favorable, but surgery is frequently performed in patients with persistent sciatic pain<sup>7</sup>. In recent years, outcome based on patients' own assessments, such as satisfaction with treatment<sup>14</sup>, patients' global assessment, health-related quality of life (HRQOL)<sup>8,11,12</sup> have gained increasing interest in spinal surgery.

There is a wide evidence that severe mental illnesses affect the quality of life to a great extent. General Health Questionnaire (GHQ 12)<sup>7</sup> is a measure of current mental health. It focuses on two major areas – the inability to carry out normal functions and the appearance of new and distressing experiences.

### AIMS AND OBJECTIVES:

1. To study the null hypothesis that there is no difference between the QOL of life of patients with lumbar disc herniation undergoing open discectomy, before and after surgery
2. To study the demographic, clinical, disease related profiles of study population
3. Follow the postoperative development of HRQoL after lumbar disc herniation surgery
4. To evaluate potential relationships between preoperative factors and the development of HRQoL
5. To evaluate predictor variables affecting the outcome of surgery

### MATERIALS AND METHODS:

100 patients Patients of prolapsed lumbar intervertebral disc hospital who are undergoing elective discectomy for lumbar PIVD at single level Prospective study in the department of Orthopaedics, Katihar Medical College, Katihar from January 2019 to May 2020. All patients fulfilling the inclusion criteria and who voluntarily consented for the study were initially recruited for the study.

### INCLUSION CRITERIA:

Symptomatic patients with diagnosis of lumbar prolapsed intervertebral disc confirmed by MRI / CT, with failure to conservative treatment undergoing open discectomy and who were able to give informed consent

### EXCLUSION CRITERIA:

- Back pain less than 6 weeks
- Symptomatic but no evidence of disc herniation on CT/MRI
- Those who have had previous discectomies
- Presence of other spinal pathologies
- Any diagnosed co morbid chronic psychiatric illness
- Any diagnosed chronic debilitating medical illness

All patients meeting selection criteria were approached. Written informed consent was taken. Demographic details were recorded first. Diagnosis was confirmed using the MRI L-S spine (plain). Clinical assessments were done next. All the assessments were completed over 1-2 sessions. The HRQOL instruments were administered before surgery and at 1<sup>st</sup>, 3<sup>rd</sup>, 6<sup>th</sup> month follow ups.

### Operative Procedure Of Discectomy By open Method:

Patient was positioned in the prone position, over bolster rest. care being taken to see if the abdomen is free to prevent undue engorgement of the epidural veins and thus decrease the extent of intraoperative blood loss. A vertical midline incision was made after localizing the level of the disc. The paraspinal muscles dissected from

lamina and then lamina exposed. Lamina along with ligamentum flavum was excised. The cord was retracted, the disc herniation identified and discectomy carried out using disc removing forceps. The entire disc at that level was removed. The cord and the roots were confirmed to be decompressed and lying freely in their respective canals. The Wound was closed in layers and dressing done.

#### STATISTICAL ANALYSIS:

Analysis was carried out using the Statistical Package for Social Scientists (SPSS), 11.0 (Illinois, CA).

#### RESULT:

##### The main findings of this study were:

Majority of the patients had herniated disc at the level of L4-L5. All the patients had evidence of degeneration of disc material in the form of loss of disc height more than 50% on MRI of LS spine

The detailed analysis of scores of 8 subscales of SF-36 showed that the scores of all subscales improved significantly after surgery at the end of 6 months. The most affected scores at baseline were bodily pain and physical functioning which however improved significantly after surgery.

The GHQ-12 scores were higher before the surgery suggesting poor general health which did not improve at 1<sup>st</sup> and 3<sup>rd</sup> month follow up but improved significantly at the end of 6 months

The scores of both the subscales of JOA improved significantly at the end of 6 months. The scores of VAS improved significantly at all the 3 follow ups. The mean score of MADRS did not change significantly at 1<sup>st</sup> and 3<sup>rd</sup> follow up but improved significantly at the end of 6 months. The prevalence of depression in our population before surgery was 13.75%. At the end of 6 months 82% of the depressed patients achieved remission. Female gender had significant positive correlation with scores of PF at 6 months, GH at baseline, RE at baseline and MH at baseline. Baseline VAS score had significant negative correlation with baseline PF score and significant positive correlation with GH at 6 months and MADRS score at 6 months. Baseline GHQ 12 score had significant negative correlation with PF, RP, BP, GH, vitality, RE and MH subscales at baseline. It also showed significant positive correlations with MADRS scores both at baseline and at 6 months.

**Table 1: Clinical Profile of Study Population**

|                                    |                        |           |
|------------------------------------|------------------------|-----------|
| Presenting complaints – N (%)      | LBP with radiculopathy | 42 (52.5) |
|                                    | Radiculopathy          | 28 (35)   |
|                                    | Paresthesias           | 10 (12.5) |
| Duration of symptoms – N (%)       | < 6 months             | 70 (87.5) |
|                                    | > 6 months             | 10 (12.5) |
| Onset of symptoms – N (%)          | Insidious              | 80 (100)  |
| History of trauma                  | Nil                    | Nil       |
| Past history of similar complaints | Nil                    | Nil       |
| History of steroid intake          | Nil                    | Nil       |
| Family history of similar symptoms | Nil                    | Nil       |

**Table 2: Details of Neurological Examination**

|                                  |               |          |
|----------------------------------|---------------|----------|
| SLRT                             | 60-80 degrees | 80 (100) |
| Bulk LL (B/L)                    | Normal        | 80 (100) |
| Power in all muscle groups of LL | 5/5           | 80 (100) |
| Tone LL                          | Normal (B/L)  | 80 (100) |
| Reflex at knee and ankle         | 2/5           | 80 (100) |
| Babinski reflex                  | Flexor (B/L)  | 80 (100) |
| Sensory blunting                 | Absent        | 80 (100) |

**Table 3: Details of Radiological Evaluation of the Spine**

|                 |                                       |       |           |
|-----------------|---------------------------------------|-------|-----------|
| X-ray L-S spine | Lithesis absent                       |       | 80 (100)  |
|                 | Lithesis present                      |       | 0         |
| MRI L-S spine   | Level of disc herniation              | L4-L5 | 62 (77.5) |
|                 |                                       | L5-S1 | 17 (21.3) |
|                 |                                       | L3-L4 | 1 (1.3)   |
|                 | Disc degeneration present             |       | 80 (100)  |
|                 | Loss of disc height – superior to 50% |       | 80 (100)  |

#### DISCUSSION:

This study was aimed at studying the HRQOL of patients undergoing

lumbar disc herniation surgery and whether the surgery improves quality of life of these patients. The duration of follow up in our study was 6 months. Most of the prospective studies in this area have similar follow up period of 3 months to 1 year duration.<sup>12</sup> The longest follow up period was of 7 years in one study<sup>12</sup>, however they found that there were no significant changes in the outcome variables between 2 year and 7 year follow-ups. Our study sample consisted of 100 patients initially, with final population of 80 patients owing to loss of subjects in follow up and other unavoidable issues discussed earlier. This size of the sample was adequate compared to other studies like study by Kagaya et al<sup>11</sup> (N-45 subjects), pilot study by Saban et al<sup>11</sup> (N-57 subjects), 2 and 7 year follow up study by Silverplatt et al<sup>12</sup> (N-117 subjects) and so on. None of the studies had very long term longitudinal prospective design with large population based studies. So, case-control studies like current study would provide much meaningful estimates of HRQOL in these patients.

The demographic characteristics of our study population was similar to other previous studies. The characteristics like religion and race could not be compared as other similar studies were not found from India.

This male preponderance was found in all other previous studies.<sup>12</sup> Male predominance can be owed to more outdoor and strenuous job types amongst males (especially in Indian scenario) leading to disc degeneration and male dominance of help seeking in health sector.

The major presenting symptom in our population was radiculopathy which is back pain radiating to the leg along the nerve distribution. In previous studies back pain or leg pain were the chief complaints.<sup>12</sup> However few studies have divided patients into back pain and leg pain category.<sup>12</sup> Our study population did not have any neurological sequelae. This could be probably due to the lesser duration of symptoms before presentation (less than 6 months in 70 patients). Majority of our patients had the level of disc herniation at L4-L5 (77.5%) which is similar to study by Kagaya et al.<sup>13</sup> We excluded other co morbidities as they had a bearing on quality of life of patients and in psychiatric co morbidity levels. This could have biased the results. In study by Kagaya et al<sup>11</sup> major diagnosed psychiatric illnesses were excluded similarly.

We considered using SF-36 because it gives a holistic measure of HRQOL and JOA alone does not measure quality of life of low back pain patients.<sup>12</sup> So the initial lack of improvement can be correlated to depression. An average depressive episode lasts for 6 months. Some of the patients received treatment for depression but were not compliant. We concluded that low back pain interferes the most with bodily pain, physical functioning of HRQOL which is supported by the conclusions deduced in study by Kagaya et al.<sup>11</sup>

The mental health component of SF-36 in our study population started improving from 1<sup>st</sup> month onwards and maintained improvement further. This finding is supported by other studies by Farzanegan et al.<sup>12</sup> Quality of life improved after 2 years, with no further improvement after 5 more years. Low quality of life and severe leg pain at baseline were important predictors of improvement in quality of life after disc herniation surgery.

In our study both subjective and clinical subscales of JOA showed significant improvement at all the levels of follow-up except for the 1<sup>st</sup> month score of subjective symptoms subscale which did not show significant improvement. These results are supported by other studies.

Data regarding depression and anxiety in patients undergoing disc surgery are rare, and studies differ widely depending on the assessment methods used. In a systematic review by Zieger et al<sup>12</sup>, the prevalence rates for depression and anxiety in patients undergoing disc surgery varied between 21.5% and 49.3% before and between 4.1% and 79.6% after disc surgery. Our study found a prevalence of 13.75% of depression amongst subjects before surgery and the prevalence dropped down to 12.5%, 10% and 2.5% respectively at 1<sup>st</sup>, 3<sup>rd</sup> and 6<sup>th</sup> month follow ups respectively. Baseline GHQ 12 score had significant negative correlation with PF, RP, BP, GH, vitality, RE and MH subscales at baseline. It also showed significant positive correlations with MADRS scores both at baseline and at 6 months. In other words, worse general health at baseline (which is a measure of depression) led to poor HRQOL. Similarly more occurrence of depression on MADRS scale. These findings are supported by studies by Silverplatt et al<sup>12</sup> and Jansson et al.<sup>12</sup>

**CONCLUSION:**

The discectomy procedure not only relieves the pain symptom but also improves depression resulting from pain symptoms, functionality, general health and overall quality of life of patients. Females with back pain have better quality of life than male counterparts. Severity of pain is associated with poor physical functioning and higher depression rates. Pre surgical general health has a bearing on all the aspects of quality of life.

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