

RESEARCH ARTICLE

Prevalence and Severity of Preoperative Disabilities in Iranian Patients with Lumbar Disc Herniation

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Abstract

Background: Literature recommends that refractory cases with lumbar disc herniation and appropriate indications are better to be treated surgically, but do all the patients throughout the world consent to the surgery with a same disability and pain threshold? We aim to elucidate the prevalence and severity of disabilities and pain in Iranian patients with lumbar disc herniation who have consented to the surgery.

Methods: In this case series study, we clinically evaluated 194 (81 female and 113 male) admitted patients with primary, simple, and stable L4-L5 or L5-S1 lumbar disc herniation who were undergoing surgical discectomy. The mean age of the patients was 38.3 ± 11.2 (range: 18-76 years old). Disabilities were evaluated by the items of the Oswestry Disability Index (ODI) questionnaire and severity of pain by the Visual Analogue Scale (VAS). Chi-square test was used to compare the qualitative variables.

Results: Severe disability (39.2%) and crippled (29.9%) were the two most common types of disabilities. Mean ODI score was 56.7 ± 21.1 (range: 16-92). Total mean VAS in all patients was 6.1 ± 1.9 (range: 0-10). Sex and level of disc herniation had no statistical effect on preoperative ODI and VAS. The scale of six was the most frequent scale of preoperative VAS in our patients.

Conclusion: Iranian patients with lumbar disc herniation who consented to surgery have relatively severe pain or disability. These severities in pain or disabilities have no correlation with sex or level of disc herniation and are not equal with developed countries.

Keywords: Lumbar disc herniation, Oswestry disability index, Visual analogue scale

Introduction

Point prevalence of low back pain (LBP) in the general population ranges from 12% to 33%, while its lifetime prevalence may increase to 84% (1, 2). Moreover, the disease is the second most common cause of consultation with a doctor (3). Lumbar intervertebral disc degeneration is a common finding in patients with LBP; especially in its herniated form and it can result in severe leg pain and disability (4-7). The literature recommends that refractory cases with lumbar disc herniation with the appropriate indications should be treated surgically (8-10). However, do all patients throughout the world consent to the surgery with a same disability threshold? It seems that in some countries, due to some probable issues such as cultural beliefs (e.g., misbeliefs of lumbar disc surgery) or economic concerns (e.g., low income level or public insurance coverage), the percentage of the patients who consent to surgery is different. In this study, we aim to elucidate the prevalence and severity of disabilities

and pain in Iranian patients with lumbar disc herniation who have consented to the surgery.

Materials and Methods

In this case series study, after local institutional review board approval (code number 910873) we clinically evaluated 194 admitted patients with lumbar disc herniation who were to undergo surgical discectomy. This evaluation was performed just one or two days before the surgical operation. Our inclusion criteria were patients who were admitted for lumbar discectomy, simple and primary lumbar disc herniation with refractory complains with more than six weeks nonoperative treatment, and a progressive neurologic deficit associated with stable psychological conditions. Patients with cauda equina syndrome, two or more levels of lumbar disc herniations, worker's compensation, unstable spine, revision surgeries, or who needed some kind of spinal instrumentation or fusion were excluded from the study. Due to the low prevalence of other

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Figure 1. A 26 years old man presented with left L4-L5 disc herniation and lateral trunk shift (list). After appearance of severe disability and deformity, the patient finally consented to surgical discectomy. Preoperative ODI, leg and lumbar VAS were 60%, 8, and 6, respectively for six months.

disc herniations and in order to avoid distortion of the results, only the patients with L4-L5 or L5-S1 disc herniation were considered.

This evaluation was performed by two types of questionnaires. Disabilities were evaluated by the Oswestry Disability Index (ODI) questionnaire version 2.1 and severity of pain was separately scored by the Visual Analogue Scale (VAS) (11, 12). Previously, the ODI questionnaire had been translated and validated for Persian speaking patients (13). ODI scores 0-20%, 21-40%, 41-60%, 61-80%, and 81-100% were assigned as minimal disability, moderate, severe, crippled, and bed-bound or malingered, respectively (Figure 1).

Statistical analysis

We used the SPSS (Statistical Package for Social Science) version 16 for windows (SPSS Inc., Chicago, IL, USA) to perform the statistical analysis. The Chi-square test was used to compare the qualitative variables. In all statistical tests, $p < 0.05$ was considered significant.

Results

We evaluated 194 patients who comprised of 81 females (41.8%) and 113 males (58.2%). The mean age of the patients was 38.3 ± 11.2 (range: 18-76 years old). The prevalence of L4-5 and L5-S1 disc herniations among our patients were 119 (61.3%), and 75 (38.7%), respectively. There was no significant relationship between the level of lumbar disc herniation and sex of the patients ($p=0.570$).

Table 1. Prevalence of ODI scoring in our patients

| ODI | Prevalence (M/F*) | Percent |
|-------------------------|-------------------|---------|
| Minimal disability | 10 (4/6) | 5.2 |
| Moderate disability | 20 (15/5) | 10.3 |
| Severe disability | 76 (48/28) | 39.2 |
| Crippled | 58 (33/25) | 29.9 |
| Bed-bound or Malingered | 30 (13/17) | 15.5 |

M/F*: Male to Female ratio

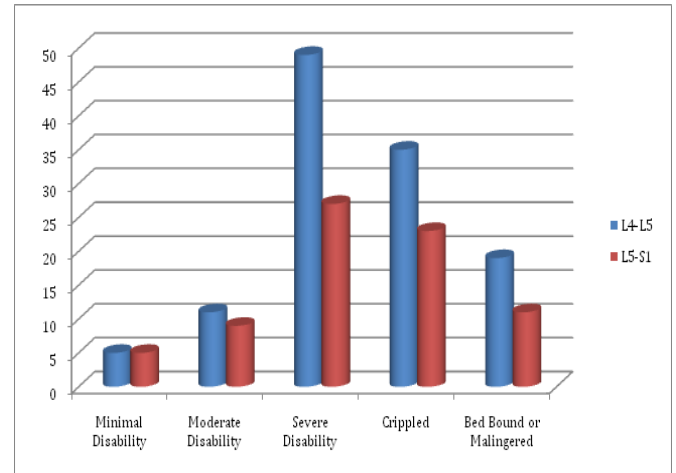


Figure 2. Prevalence of disabilities in peculiar levels of involvement.

Severe disability and crippled were the two most common types of disabilities observed in our operating patients. Mean ODI score in all patients was 56.7 ± 21.1 (range: 16-92). The mean total ODI in L4-L5 and L5-S1 patients was 58.3 ± 19.5 and 54.4 ± 15.6 , respectively. Figure 2 shows the link between level of lumbar intervertebral disc herniation and severity of the disability.

These differences in ODI scores had no significant relationship with the level of disc herniation. Table 1 shows the frequency and severity of various kinds of disabilities in our patients. As a whole, sex had no statistical effect on ODI ($p=0.125$). The prevalence of various items of ODI was also shown in Table 2.

Total mean VAS in all patients was 6.1 ± 1.9 (range: 0-10). Pain in the patients with L4-L5, and L5-S1 disc herniation was scored (according to VAS) as 6.2 ± 1.5 and 5.9 ± 2.1 , respectively. Similar to ODI, we could not find any significant relationship between pain severity and patients' gender or level of the disc herniation ($p=0.177$ and 0.924 , respectively). Prevalence of various levels of pain severity experienced by our patients was shown in Table 3.

Discussion

In this study we evaluated the prevalence and severity of

Table 2. Prevalence of different disability items (according to ODI) in our patients

| ODI items | Score (%) | | | | | | NR* |
|-------------------|-----------|------|------|------|------|------|-----|
| | 0 | 1 | 2 | 3 | 4 | 5 | |
| 1- Pain Intensity | 7.7 | 5.7 | 7.7 | 24.7 | 38.1 | 16 | 0 |
| 2- Personal Care | 8.8 | 21.1 | 25.8 | 14.4 | 18.6 | 11.3 | 0 |
| 3- Lifting | 1.0 | 17.5 | 10.3 | 23.2 | 30.4 | 17.5 | 0 |
| 4- Walking | 9.3 | 9.8 | 8.8 | 46.4 | 13.9 | 11.9 | 0 |
| 5- Sitting | 7.7 | 6.7 | 21.1 | 20.1 | 27.8 | 6.2 | 0 |
| 6- Standing | 2.1 | 7.7 | 8.2 | 17.0 | 44.3 | 20.6 | 0 |
| 7- Sleeping | 25.8 | 22.2 | 11.9 | 13.4 | 11.9 | 14.9 | 0 |
| 8- Sex life | 10.3 | 18.6 | 9.3 | 25.8 | 7.2 | 12.9 | 16 |
| 9- Social Life | 4.6 | 9.8 | 9.8 | 42.3 | 19.1 | 14.4 | 0 |
| 10- Traveling | 2.6 | 16.5 | 16.5 | 13.9 | 13.4 | 37.1 | 0 |

NR*: No Reply

Table 3. Prevalence of pain severity (according to VAS) in our patients

| VAS | Prevalence (M/F*) | Percent |
|-----|-------------------|---------|
| 0 | 1 (1/0) | 0.5 |
| 1 | 5 (4/1) | 2.6 |
| 2 | 13 (9/4) | 6.7 |
| 3 | 6 (4/2) | 3.1 |
| 4 | 20 (14/6) | 10.3 |
| 5 | 25 (17/8) | 12.9 |
| 6 | 44 (26/18) | 22.7 |
| 7 | 21 (14/7) | 10.8 |
| 8 | 31 (14/17) | 16.0 |
| 9 | 6 (3/3) | 3.1 |
| 10 | 22 (7/15) | 11.3 |

M/F*: Male to Female ratio

preoperative disabilities and pain in Iranian patients with lumbar disc herniation, who were undergoing surgical discectomy. We found that in these patients, mean preoperative ODI and VAS was 56.7 and 6.1, respectively. Most of the patients (69.1%) consented to surgery when they became severely disabled or crippled.

Okoro and Sell in a prospective cohort study in the United Kingdom compared surgical outcomes between L4-L5 and L5-S1 disc herniation in 140 patients with a mean age 40.6 ± 11.3 (range: 26-75 years) (14). Preoperative ODI for L4-L5 and L5-S1 patients was 56.6 and 58.2 respectively, while preoperative VAS was 7.7 and 7.5. In our study, the mean preoperative ODIs were comparable; however, preoperative VASs were lower (6.2 and 5.9 respectively). These differences in VAS (despite similar disability rate) could show that our patients had a higher pain tolerance. Dewing *et al* (San Diego, USA, 2008) in a prospective longitudinal clinical study evaluated the correlation of lumbar discectomy results with herniation type and level in 183 young active patients (15). In this study, the mean preoperative age, VAS and ODI were 27.0 years, 7.2 and 53.6, respectively. Although the age of the patients of this study is lower than ours, preoperative ODI is relatively similar (56.7 in our study). Again, mean preoperative VAS in our study showed a lower score (6.1 vs. 7.2). This difference also suggests that pain endurance in our patients may be greater.

Carragee *et al* in a prospective observational study of 187 consecutive American patients undergoing single-level primary lumbar discectomy evaluated the impact of com-

petency of the annulus and type of herniation on postoperative results (16). In this study, irrespective to the level of disc herniation, mean preoperative ODI for all patients was 47.2 (range: 18-88). This score was significantly lower than our study (56.7 ± 21.1) and this difference suggests that the patients in our country due to some reasons did not readily consent to the surgery, could not easily afford the cost, had an unrealistic fear of surgery, or perhaps due to other unknown reasons. In another study in New Hampshire (the USA), Lurie *et al* in the spine Patient Outcomes Research Trial evaluated the impact of herniation level on lumbar discectomy outcome (17). In this study, pain was scored based on the Short Form-36 bodily pain score (not VAS) and this index for the patients with L4-L5 and L5-S1 disc herniation was 25.6 ± 19.4 and 25.6 ± 17.2 , respectively. Therefore, we cannot precisely compare the pain threshold, but in their study, the mean preoperative ODI score for the patients with L4-L5 and L5-S1 disc herniation was 50 ± 21.8 and 49.5 ± 21.1 , respectively. These scores were relatively lower than ours (58.3 ± 19.5 and 54.4 ± 15.6 , respectively) and this may indicate that our patients presented with more severe degrees of disability and hardly consented to the surgical discectomy.

Our study and comparisons disclosed that in the patients with refractory lumbar disc herniation who were candidates for surgical discectomy, preoperative VAS and ODI may vary from one country to another. Why do our patients with lumbar disc herniation less likely consent to surgery? Do they have an unrealistic fear of lumbar surgery or is it because they cannot afford the expenses? Is the pain threshold higher in developing countries? This is a complex and challenging matter and we propose that more comprehensive and multicentric research be carried out on this issue in the future.

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