

# A Study on the Role of Social and Demographic Factors on Clinical Spectrum of Lumbar Disc Herniation and Surgical Methods Adopted in a Tertiary Care Hospital

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## ABSTRACT

### BACKGROUND

The incidence of lumbar intervertebral disc prolapse is increasing in the current practice of neurosurgery. We wanted to study the social and demographic factors playing a role in the clinical spectrum of lumbar disc herniation patients and analyse the surgical treatment adopted.

### METHODS

This is a prospective observational study of 200 patients with herniated lumbar disc conducted in the Department of Neurosurgery, Government Medical College, Trivandrum, during the period of April 2017 - March 2018. Among the selected patients, the demographic profile, clinical profile, radiological profile, and the surgical procedures adopted were observed and analysed. All patients were followed for a period 6 months postoperatively for the presence of complications.

### RESULTS

Mean age of the patients was  $44.7 \pm 4.65$  years. Males were 113 (56.50%) and females were 87 (43.5%). Low back pain was the most predominant presenting complaint present in 187 (93.50%) patients and followed by radicular pain in 171 (85.5%) patients. L4 - L5 inter space was involved in 122 (61.0%) patients, disc was extruded in 91 (45.5%) patients. Disc protrusion was observed in 81 (40.5%) of the patients. 45.5% of patients had extruded disc; the least common type was sequestered type which was seen in 14% of the patients.

### CONCLUSIONS

The incidence of lumbar intervertebral disc prolapse is on the rise requiring medical attention. The most common age group affected was 31 - 50 years. Males were commonly affected which can be explained by the fact that men are exposed to more mechanical stresses like trauma, heavy weightlifting than females. Low back ache was the most common presenting complaint followed by radicular pain. Surgical methods adopted for LDH were very safe and successful with a success rate of 93%.

### KEYWORDS

Lumbar Disc Herniation, Endoscopy, Dural Tear, SLR and Lumbarization

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## BACKGROUND

Low back pain is experienced in nearly 80% of the adults at some point of time, and it remains as one of the main causes of restriction of physical activity in adults aged less than 45 years.<sup>(1)</sup> Even though the aetiologies vary for the causation of low back pain but the clinical presentation also varies. Lumbar disc prolapse constitutes about 1% of cases with back pain.<sup>(2)</sup> The structure of the intervertebral disc is made up of nucleus pulposus (NP) in the center surrounded by annulus fibrosus (AF) outside. NP is the main source of collagen secretion which is made up of numerous proteoglycans (PG); these help in retaining water, which provides the hydrostatic pressure to help resist the compression of the spine axially during physical activities.<sup>(3,4)</sup> The 20% of the dry weight of NP is provided by type II collagen. Whereas the surrounding AF which helps in retaining the NP in the center has low amount of PG. AF basically consists of (>70%) concentric type I collagen fibers.<sup>(3,5,6)</sup> The commonly observed narrowing of the thecal sac in LDH radiographic pictures is due to extrusion of the NP through intact AF. But the continuity with the disc space is maintained and sometimes complete loss of continuity occurs with sequestration of a free fragment with intact disc space. Certain degenerative changes in the NP are thought to initiate the changes in the intervertebral disc and consequently contribute to LDH.

One of the frequent changes mentioned are reduced water retention in the NP<sup>(5,7,8)</sup> increased content of type I collagen in the NP and inner AF<sup>(9)</sup> degeneration of collagen and extracellular matrix (ECM) materials<sup>(10)</sup> and up regulation of systems of degradation such as apoptosis, matrix metalloproteinase (MMP) expression, and inflammatory pathways.<sup>(11)</sup> Dehydration is known to contribute to the pathogenesis of degenerative disc disease.<sup>(7,8)</sup> The symptomatology of Lumbar disc prolapse includes low back pain, radicular pain numbness, weakness, bowel/bladder disturbances, and paraesthesia. For lumbar disc surgery, pain is the most important indication. Since the first surgical method for the treatment of ruptured intervertebral disc by Mixter and Barr,<sup>(3)</sup> there are many procedures described in the literature.

Among the surgical management, Laminectomy and discectomy are the common procedures performed for the management of intervertebral disc prolapse. In most reports the post-operative changes in neurological signs and functional recovery from pain have shown striking variations. These variations may be caused by several factors, including differences in patient selection and examination technique.<sup>(4)</sup> The success rate of lumbar disc surgeries reported in the literature, documents somewhere between 38-99%.<sup>(5,6,7)</sup> Lumbar intervertebral disc prolapse requiring medical attention is on the rise day by day. There are very few studies done prospectively to assess the clinical spectrum of lumbar disc prolapse and its surgical outcome. Low back pain (LBP) accounts for 12% of the total painful conditions in the world population at any given instance.<sup>(8)</sup> Whereas the prevalence of Low Back Pain occurs annually in 38% of the world population and the lifetime prevalence was reported, as high as 80%.<sup>(9)</sup> Gender differences in the

occurrence of LBP have been observed, with females more commonly affected than males. Osteoporosis, pregnancy, and variations in reporting of somatic symptoms, explains the gender differences in the prevalence of LBP. Age also plays a role in the epidemiology of LBP. As age advances prevalence increases, with peak prevalence between 60 and 70 years.<sup>(8)</sup> The role of sedentary lifestyles, access to health care and obesity are all thought to contribute development of LBP. Lumbar disc prolapse constitutes about 1% of cases with back pain.<sup>(2)</sup> Few authors opine that it is difficult to correlate between LBP and intervertebral disc degeneration.<sup>(10)</sup> In the symptomatic patients it was observed that disc degeneration was frequently associated with abnormal growth of neurovascular tissue within the nucleus pulposus and annulus fibrosis.<sup>(11)</sup> Annular tears in the AF resulting in structural changes initiates regional immune response is.<sup>(12)</sup>

The neo-vascular granulation tissue evokes release of excessive cytokines like interleukin-6 and -8 and prostaglandin E2.<sup>(13)</sup> These inflammatory chemo-mediators sensitize local pain receptors, thereby lowering pain thresholds. At the same time excessive mobility at intervertebral disc results in conjunction with these structural and biomechanical changes. The overall biomechanics of the lumbar spine are disturbed altered, with the load on the facet joints, ligaments, and paraspinal musculature producing potent generators of pain.<sup>(10)</sup> In a recent study aquaporins are blamed even though specific genetic polymorphism was not found to be associated with LDH.<sup>(13)</sup> Clinical evaluation of patients with lumbar disc disease requires knowledge of anatomy, spinal biomechanics, disc degeneration and bone metabolism as well as spinal imaging. Hence this study is done to assess the clinical profile of lumbar disc herniation, the surgical outcome of lumbar disc herniation, and to study the factors influencing surgical outcome.

## METHODS

This is a prospective, observational study conducted over a period of 1 year from April 2017 to March 2018 in the Department of Neurosurgery, Government Medical College, Thiruvananthapuram, among patients admitted in the neurosurgery ward for lumbar disc herniation treatment.

### Inclusion Criteria

Patients with radicular pain and evidence of nerve root irritation were included. 2. Patients with motor deficit were included 3. Patients with sensory deficit were included. 4. Those patients with signs of Neuroimaging demonstrating herniated disc were included. 5. Patients willing to give informed written consent were included.

### Exclusion Criteria

1. Patients who have undergone prior lumbar surgery were excluded 2. Patients with scoliosis more than 15° were excluded Patients with segmental instability were excluded.

3. Patients with Vertebral fractures were excluded. 4. Patients with spine infection or tumour or, inflammatory spondylo- arthropathy were excluded. 5. Patients with pregnancy, co-morbid conditions contraindicating surgery were excluded. 6. Patients not willing to undergo surgery within 6 months were excluded. 7. Patients with Post-polio paralysis/Motor Neuron Disease/connective tissue disorders were excluded.

The records of the 200 patients included were written to include patient's age, sex, residence, social group (subjects were classified as low: holding Government social security card, Middle group: More than 7 Lakhs annual income and High: More than 12 Lakhs annual income group) and employment status. For each patient, four dates were also recorded: onset of symptoms, referral to hospital, operation and recovery. The clinical profile, radiological profile and the surgical interventions done will be studied. After the initial clinical assessment, MRI of the lumbar spine was done in all patients to assess the position, level, and type of herniation of the intervertebral disc. Surgical procedures consisted of classical micro lumbar discectomy, minimally invasive discectomy, and Laminectomy and discectomy. All patients were followed up at least 6 months. The state of satisfaction was graded as excellent, good, fair, or poor. "Excellent result" meant, the patient had no complaints and was able to return to full working capacity. "Good result" indicated that the patient had full working capacity but slight low back and leg pain. Excellent result or good results were regarded as satisfactory outcome. "Fair result" indicated that the patient does not have normal working capacity; low back and leg pain was reduced but the patient still required the administration of analgesics. "Poor result" meant that the degree of pain was unchanged or worse and the patient required regular administration of analgesics.<sup>(10)</sup>

### Statistical Analysis

All the clinical Data were entered in excel sheets and analysed using SPSS software. The mean values, Standard deviation and percentages were calculated to express the incidences in the study. Study sample: In the present study the sample size was calculated by using online sample size calculator (<https://www.calculator.net/sample-size-calculator.html>) Where in the confidence level was taken as 95%, margin of error as 5%, population proportion was taken as 85.4% and population size as unlimited.

### Ethical Considerations

Institutional ethical committee clearance was obtained. Informed written consent was obtained from the participants. Confidentiality was ensured and maintained throughout the study. Complications, when observed, were dealt with accordingly.

## RESULTS

Among the 200 patients included in the study based on the inclusion criteria there were 31 patients in the age group of 21 to 30 years (15.5%), 51 patients in the age group of 31 to 40 years (25.5%), 61 patients in the age group of 41 to 50 years (30.5%), 42 patients in the age group of 51 to 60 years (21%) and 15 were aged above 60 years (07.5%), (Table 1).

| Age in Years | Number of Patients | Percentage |
|--------------|--------------------|------------|
| 21-30        | 31                 | 15.5       |
| 31-40        | 51                 | 25.5       |
| 41-50        | 61                 | 30.5       |
| 51-60        | 42                 | 21.0       |
| >60          | 15                 | 07.5       |

**Table 1. Age Distribution of the Study Subjects (n - 200)**

| Gender       | Frequency  | Percentage |
|--------------|------------|------------|
| Male         | 113        | 56.5       |
| Female       | 87         | 43.5       |
| <b>Total</b> | <b>200</b> | <b>100</b> |

**Table 2. Gender Distribution of the Study Subjects (n - 200)**

The incidence was observed highest in the age group of 41-50 years with 61 patients (30.5%). Patients aged between 30 and 50 years accounted for more than 50% of the total patients (Table 1). The lowest incidence was observed in the age group of 21 to 30 years and least was observed in >60 group. The youngest patient was age 21 years and the eldest patient was aged 67 years with mean age of  $44.25 \pm 3.20$  years. In the study out of 200 patients 113/200 (56.5%) were males and 87/200 (43.5%) were females (Table 2).

The demographic data of the subjects was tabulated in the Table 3 below. It was observed that LBH was observed in all walks of life and physical activities. This meant 192 or more measurements/surveys are needed to have a confidence level of 95% that the real value is within  $\pm 5\%$  of the measured/surveyed value. Hence the sample size was taken as 200. Patients who fulfilled the eligibility criteria will be included in the study. Observations of the onset of symptoms in the subjects showed that out of 200 patients 116 (58%) had insidious onset of symptoms, 5 (26.0%) had lifting of weight as the onset for the symptoms and trauma was the initiating factor in 32/200 (16%), (Table 4). Observation of symptomatology in the study showed that low back pain was observed in 187/200 (93.5%) patients and was the most predominant presenting complaint followed by radicular pain in 171/200 patients (85.5%), sensory symptoms were seen on 144/200 (72%) patients, motor symptoms were observed in 103/200 patients (51.5%). Out of 200 patients, 20 had (10%) bladder or bowel symptoms due to involvement (Table 4).

Among the predisposing factors (Risk factors) observed in this study smoking was present in 41/200 (20.5%) of the patients and Diabetes mellitus was observed in 38/200 (19.0%), Renal diseases was observed in 07%, Thyroid disease in 08.5% and Bronchial Asthma was found in 04.5% of the patients (Table 4).

| Variable                          | 21 – 30 Yrs. (31) | 31 - 40 Yrs. (51) | 41 - 50 Yrs. (61) | 51 - 60 Yrs. (42) | > 60 Yrs. (15) |
|-----------------------------------|-------------------|-------------------|-------------------|-------------------|----------------|
| Anthropometric-Data (Mean values) |                   |                   |                   |                   |                |
| Weight in Kg                      | 59.45 ± 1.30      | 65.60 ± 2.05      | 71.45 ± 1.65      | 76.25 ± 3.10      | 66.15 ± 3.10   |
| Height in Cms                     | 165.35 cms        | 166.02 ± 1.06     | 165.06 ± 2.15     | 164.24 ± 2.90     | 164.20 ± 2.55  |
| Body Mass Index Kg/m <sup>2</sup> | 27.25 ± 0.75      | 31.04 ± 2.10      | 33.50 ± 2.70      | 35.10 ± 1.65      | 34.21 ± 2.36   |
| Work Schedule                     |                   |                   |                   |                   |                |
| Sedentary work- 11 (18.6%)        |                   |                   |                   |                   |                |
| Hard labour                       | 02                | 06                | 13                | 11                | 06             |
| Army Officer                      | 13                | 21                | 26                | 16                | 02             |
| Sportsman 9 (15.2%)               | 03                | 05                | 06                | 02                | 02             |
| Regular sports 6 (10.1%)          | 05                | 09                | 13                | 10                | 04             |
| Housewife                         | 04                | 05                | 02                | 02                | 00             |
| Sports man                        | 03                | 05                | 01                | 01                | 01             |
| Regular sportsman                 | 01                | 00                | 00                | 00                | 00             |
| Gymnast                           |                   |                   |                   |                   |                |
| Gymnasium - regular sports        |                   |                   |                   |                   |                |
| Economic status                   |                   |                   |                   |                   |                |
| Low group                         | 06                | 09                | 13                | 11                | 04             |
| Middle group                      | 18                | 35                | 37                | 23                | 07             |
| High group                        | 07                | 07                | 11                | 08                | 04             |
| Vegetarian                        | 22                | 31                | 41                | 29                | 08             |
| Non- vegetarian                   | 09                | 10                | 20                | 13                | 07             |
| Smoker                            | 08                | 14                | 21                | 11                | 04             |
| Non-Smoker                        | 23                | 27                | 40                | 31                | 11             |
| Co-morbid conditions              |                   |                   |                   |                   |                |
| Hypertension - 41                 | 00                | 07                | 12                | 13                | 09             |
| Diabetes Mellitus - 38            | 00                | 04                | 11                | 13                | 10             |
| Renal diseases -14                | 02                | 01                | 03                | 06                | 02             |
| Thyroid disease - 17              | 02                | 03                | 05                | 03                | 04             |
| Bronchial Asthma - 19             | 01                | 03                | 04                | 08                | 04             |

Table 3. Demographic Data of the Study Subjects (n-200)

| Observations                           | Frequency  | Percentage  |
|--|------------|-------------|
| <b>Symptoms</b>                        |            |             |
| Insidious                              | 116        | 58.0        |
| Lifting Heavy weight                   | 52         | 26.0        |
| Trauma                                 | 32         | 16.0        |
| <b>Total</b>                           | <b>200</b> | <b>100</b>  |
| <b>Symptoms</b>                        |            |             |
| Low Backache                           | 187        | 93.5        |
| Radicular pain                         | 171        | 85.5        |
| Sensory symptoms                       | 144        | 72.0        |
| Motor symptoms                         | 103        | 51.5        |
| Bladder or Bowel symptoms              | 20         | 10          |
| <b>Predisposing factors</b>            |            |             |
| Smoking                                | 41         | 20.5        |
| Diabetes Mellitus                      | 38         | 19.0        |
| Renal disease                          | 14         | 07.0        |
| Thyroid disease                        | 17         | 08.5        |
| Bronchial Asthma                       | 19         | 04.5        |
| <b>Total</b>                           | <b>129</b> | <b>64.5</b> |
| <b>Clinical signs</b>                  |            |             |
| FABER test                             | 62         | 31          |
| Motor deficit                          | 151        | 75.5        |
| Sensory deficit                        | 147        | 73.5        |
| SLR test                               | 163        | 81.5        |
| Cross SLR test                         | 46         | 23          |
| <b>Spinal level</b>                    |            |             |
| L2 - L3                                | 03         | 1.5         |
| L3 - L4                                | 20         | 10          |
| L4 - L5                                | 122        | 61          |
| L5 - S1                                | 55         | 27.5        |
| <b>Total</b>                           | <b>200</b> | <b>100</b>  |
| <b>Type of Herniation</b>              |            |             |
| Protrusion                             | 81         | 40.5        |
| Extrusion                              | 91         | 45.5        |
| Sequestration                          | 28         | 14.0        |
| <b>Total</b>                           | <b>200</b> | <b>100</b>  |
| <b>Type of Lumbo-sacral transition</b> |            |             |
| Lumbarization                          | 03         | 1.5         |
| Sacralisation                          | 22         | 11.0        |
| <b>Total</b>                           | <b>25</b>  | <b>12.5</b> |

Table 4. Incidence of Onset of Symptoms, Symptoms Proper, Predisposing Factors, Clinical Signs, Spinal Level, and Type of Herniation in the Study Subjects (n-200)

Clinical examination revealed, straight leg rising test was positive in 81.5% of the patients, crossed SLR was positive in 23%, FABER test was present in 31%. Motor deficit was present in 75.5% of the cases, sensory deficit in 73.5% of patients (Table 4). Among the 200 patients majority of patients had involvement of L4 - L5 spinal level in 122/200 (61%), followed by L5 - S1 in 55/200 (27.5%), L3 - L4 spinal

level in 20/200 (10%) and least involvement was observed in L2 - L3 level 03/200 (1.5%) of the patients (Table 4). Out of 200 patients, 91/200 (45.5%) patients had extruded disc, protruded disc was present in 81/200 (40.5%) and the least type was sequestered type 28/200 (14%), (Table 4). Out of 200 patients, 03/200 patients (1.5%) had lumbarization and 22/200 (11%) had sacralisation of spine (Table 4). (FABER: flexion abduction external rotation test, SLR: Straight Leg Raising test).

| Type of Surgery                | Frequency  | Percentage | Successful Surgeries | %         |
|--------------------------------|------------|------------|----------------------|-----------|
| Laminectomy and discectomy     | 64         | 32         | 58                   | 90.62     |
| Hemilaminectomy And discectomy | 37         | 18.35      | 34                   | 91.89     |
| Micro lumbar discectomy        | 58         | 29         | 56                   | 96.55     |
| Minimally invasive discectomy  | 41         | 20.5       | 38                   | 92.68     |
| <b>Total</b>                   | <b>200</b> | <b>100</b> | <b>186</b>           | <b>93</b> |

Table 5. Type of Surgeries Performed and Their 6 Months Follow Up Results in the Subjects (n-200)

| Variable                       | Excellent |      | Good |      | Fair |      | Poor |      | $\chi^2$ df P   |
|--------------------------------|-----------|------|------|------|------|------|------|------|-----------------|
|                                | N         | %    | N    | %    | N    | %    | N    | %    |                 |
| Laminectomy and discectomy     | 25        | 39.1 | 34   | 53.1 | 04   | 06.3 | 01   | 01.6 | 39.974 9 <0.001 |
| Hemilaminectomy and discectomy | 24        | 64.9 | 11   | 29.7 | 01   | 02.7 | 01   | 02.7 |                 |
| Micro lumbar discectomy        | 45        | 77.6 | 09   | 15   | 02   | 03.4 | 02   | 03.4 |                 |
| Minimally invasive discectomy  | 35        | 85.4 | 02   | 04.9 | 01   | 02.4 | 03   | 07.3 |                 |

Table 6. Surgical Interventions Influencing the Outcome in Different Types of Surgeries Performed in the Study (n-200)

Out of 200 patients, 64/200 (32%) underwent Laminectomy and discectomy, Hemilaminectomy and discectomy was done in 37/200 (18.5%), micro lumbar discectomy in 38/200 (29%) and Micro lumbar discectomy (MIS) in 41 (20.5%) patients (Table 5). Six months after surgery, follow up all the patients was done to assess for relief of symptoms and recovery of sensory and/or motor deficits. They were successful in 58/64 (90.62%) patients

who had undergone Laminectomy and Discectomy, 34/37 (91.89%) of the patients who had undergone Hemilaminectomy and discectomy, 56/58 (96.55%) of those who had undergone Micro lumbar discectomy and 38/41 (92.68%) of the patients who had undergone minimally invasive discectomy (Table 5). The overall success rate was 93% (Table 5).

In this study it was observed that 85.4% of the MIS group had excellent outcome, when compared to 39.1 % in the Laminectomy group, which show statistical significance with  $p$  at  $<0.001$  ( $p$  taken as significant at  $<0.05$ ), (Table 6).

## DISCUSSION

The incidence of lumbar intervertebral disc prolapse is increasing. There are very few studies done prospectively to assess the clinical spectrum of lumbar disc prolapse and its surgical outcome. Hence this study was done to assess the clinical profile of lumbar disc herniation, the surgical outcome of lumbar disc herniation, and to study the factors influencing surgical outcome. In this study 200 patients with LDH in whom the surgical procedures were performed were included. Mean age of the patients in this study was  $44.25 \pm 3.20$  years. The maximum numbers of patients were in the age group 41-50 years, i.e. 61 cases (30.5%). Minimum age observed was 21 years and maximum was 67 years. In the study done by Sidram et al,<sup>(14)</sup> mean age of the patients was 45.9 years. Majority of the patients' age group ranged from 40-49 years (33%). In study done by Akbar et al,<sup>(15)</sup> majority of patients were between 31-45 years. In the present study, male to female ratio was 1.29, out of 200, 56.5% were males and 43.5% females. In study by Sidram et al,<sup>(15)</sup> male to female ratio was 1.56, 61% were males and 39% females. Male to female ratio was 2.6:1 in study done by Akbar et al.<sup>(14)</sup>

This male prevalence for disc prolapses can be explained by the fact that men are exposed to more mechanical stresses like trauma, heavy weightlifting compared to females. In the present study more than half of the patients (58%) had insidious onset of the symptoms, 26% developed symptoms while lifting heavy weight and 16% after trauma. In study by Sidram et al,<sup>(15)</sup> (55%) had insidious onset of the symptoms 35% following lifting an inappropriate weight and in another 10% it was followed after trauma and twisting injury. In the present study out of 200 patients 19% were diabetics and 20.5% were smokers. Assessing symptomatology, low back pain (93.5%) was the most predominant presenting complaint followed by radicular pain (85.5%), sensory symptoms (72%), and motor symptoms (51.5%). Out of 200 patients, 10% had bladder or bowel involvement. In study by Sidram et al,<sup>(15)</sup> the most common presenting symptom was radicular pain (96%) and axial low back pain (94%) ranked the second. Numbness of the limbs was observed in (61%), motor weakness in (47%), bowel bladder disturbances was noted in (11%) and paraesthesia in (26%). In study by Akbar et al,<sup>(14)</sup> 46.9% had low back pain with radiation to leg, neurogenic claudication in 18.7%. 6.2% had sphincter dysfunction. In the present study clinical

examination revealed, straight leg rising test was positive in 81.5% of the cases, crossed SLR was positive in 23%, FABER test was present in 31%. Motor deficit was present in 75.5% of the cases, sensory deficit in 73.5% of cases. In study by Sidram et al,<sup>(15)</sup> straight leg rising test was positive in 91% of the cases, motor deficit was present in 77% of the cases, sensory deficit in 66.5% of cases, and sciatic irritation was observed in 67% of cases. After initial clinical assessment, MRI of the lumbar spine was done in all the patients to assess the position, level, and type of the herniation of the intervertebral disc. In the present study majority of patients, had involvement of L4 - L5 (61%), followed by with L5 - S1 (27.5%) involvement. L3 - L4 was involved in 10% and least involvement in L2 - L3 level (1.5%). In study by Sidram et al,<sup>(15)</sup> L4 - L5 inter space was involved in 138 cases (68.0%), L5 - S1 in 52 cases (26.0%), L3 - L4 in 9 patients (4.5%), and upper levels in 03 patients (1.5%). Akbar et al,<sup>(14)</sup> observed that L4 - L5 in 48 patients (50%), L5 - S1 in 35 (36.4%), L3 - L4 in 10 (10.4%) and L2 - L3 in 3 cases (3.1%). This can be explained by the fact that in the upper lumbar region, extra-foramina space is proportionally larger than the lower lumbar levels and the increased mobility of lower segments results in earlier degeneration and disc herniation. In the present study, 45.5% had extruded disc. Protruded disc was present in 40.5%. The least was sequestered type 14%. In study by Sidram et al,<sup>(15)</sup> the disc was protruded 54% of the cases, extruded in 28% of the cases, sequestered in 12% of the cases and no bulge was observed in 6% of the cases. In the present study, 1.5% had lumbarization of vertebra and 11% has sacralisation. In present study surgical intervention was done in all patients where majority, underwent Laminectomy and discectomy (32%). Hemilaminectomy and discectomy was done in 18.5%, micro lumbar discectomy in 29% and MIS in 20.5%.

## CONCLUSIONS

The incidence of lumbar intervertebral disc prolapse requiring medical attention is on the rise. The most common age group affected is 31 - 50 years. Males were commonly affected, which can be explained by the fact that men are exposed to more mechanical stresses like trauma, heavy weightlifting, than females. Low back ache was the most common presenting complaint followed by radicular pain. Surgical methods adopted for LDH were very safe and successful with a success rate of 92.5%.

Financial and Competing Interests - None

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