ORIGINAL ARTICLE

ANALYSIS OF 1058 LUMBAR PROLAPSED INTERVERTEBRAL DISC CASES IN TWO TERTIARY CARE HOSPITALS OF PAKISTAN

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Background: Characteristics of Prolapsed Intervertebral Disc (PID) in two tertiary care hospitals of Pakistan. The objective of this was to study the demographic characteristics of lumbar PID by age, gender, clinical presentation, levels of spinal column involvement, treatment options and post-operative complications for lumber disc prolapse. **Methods:** One thousand and fifty eight cases (708 males, 350 females) of prolapsed intervertebral disc over six years between January 2009 and December 2014 were studied for location of prolapsed disks, gender, age, clinical presentation, treatment options and complications of surgery. **Results:** Of the determined locations L5/S1 was the commonest (34.6%), followed by L4/L5 (33.4%). 24.2%of the patients had prolapsed disks at 2 levels (L3/L4, L4/L5 andL4/L5, L5/S1). Prolapsed disc was commonest in the 31–49 year age group. Male were mostly affected with male to female ratio of 2.02%. Most common surgery performed was discectomy with fenestration (60.64% of total surgeries performed) and most common postoperative complication being mechanical backache (4.8%). **Conclusion:** Prolapsed intervertebral disc is common in the lower lumbar region at the level of L4/L5 and L5/S1. The outcome of the patients who underwent surgery is very good with 92.19% of patients, being free of postoperative complications.

Keywords: Backache, lumbar disc prolapse, discectomy, sciatica

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INTRODUCTION

Vertebral disc is made up of outer tough annulus fibrosis and inner gel like nucleus pulposus. The annulus fibrosis undergoes degenerative changes and the inner nucleus pulposus protrudes out. Degenerative disc disease and aging[1] can both lead to disc degeneration. This condition is known as disc prolapse or commonly slipped disc. Prolapsed disc is important in our communit y as most of the people earn their living through stressful works which predisposes them to spinal injuries and ultimately leading to disc prolapse. Disc prolapse is mostly postero-lateral because of the presence of posterior longitudinal ligament; however, central disc herniation does occur.[2] The majority (95%) of disc prolapses occurs in lumbar region at the level of L4/L5 or L5/S13. Professionals sitting for prolong period in the offices, smoking, weight lifting, trauma and driving are all at a greater risk for disc prolapse. Age as it is related to wear and tear of the disc. According to most authors, degenerative diseases are more important cause of disc prolapse than trauma.[4] Professional athletes are prone to disc injuries[5,6] Backache, due to pressure on ligaments, and sciatica, due to compression of nerves, mostly forms the initial presentation of the disc prolapse. Compression of other nerve roots leads to weakness of muscles, numbness in the limbs, paraesthesia's and urinary retention, due to compression of cauda equina nerves. The life time incidence of sciatica has been reported from13 to 40%[7] in the general population.

During examination, tenderness might be noted in the lower back with the spasm of paravertebral muscles. Straight leg raising test might show limited movement on the affected side. Crossed sciatic tension when performed on raising the opposite unaffected leg, might show increased pain on the affected side. This test is not a common finding. Another special test is femoral stretch test which is present when L3/L4 nerves are affected. At the level of prolapse paraesthesia, muscle weakness and decreased reflexes might be noted. With the impairment of L5 nerve roots; there is loss of sensation on the dorsal side of the foot and lateral side of the leg and weakness in the extension of big toe. Patients might have difficulty in walking on the heel. The impairment of S1 nerve roots, leads weakness in ankle jerk reflex, weakness in plantar flexion, weakness in the eversion of the foot and loss of sensation on the lateral and planter aspect of the foot. Due to compression of cauda equina nerves, findings may include loss of sensation in the lower back and urinary retention.

The differential diagnosis for disc prolapse includes tuberculosis, spinal stenosis, vertebral abscess, ankylosing spondylitis, vertebral hematomas, vertebral tumours, nerve tumours,

paravertebral muscle sprain and mechanical pain. With the large disease burden in our community, we sought to determine outcomes for patients treated at our centre for prolapsed intervertebral discs. It was conducted with the aims and objectives of studying the various demographic aspects of lumbar prolapsed intervertebral disc patients. Our main aim was to determine age distribution, gender distribution, clinical presentation, treatment options and complications of surgery in lumber disc prolapse patients

MATERIAL AND METHODS

The current study is a retrospective study. It was a hospital based study in which 1058 cases of lumbar disc prolapse patients, in which the disease was confirmed by MRI spine, who attended neurosurgery outpatient department (OPD) during six years from January 2009 to December 2014 were included. Two hospitals included were Combined Military Hospital (CMH) Quetta and Combined Military Hospital (CMH) Peshawar. Data collected was by the author in different cities. Patients were arbitrarily divided in to six groups viz group A (1–20 years), group B (21–29 years), group C (30-39 years), group D (40–49 years), group E (50–59 years), group F (51–60 years), group G (70 and above years). The data was analysed by SPSS® statistics 20 software designed for windows. The mean hospital stay was 4 days ranging from 3 to 7 days. The follow up of patients who were conservatively treated, was at 2 weeks, 1 month, 2months and 6 months while the follow up of operated patients was done post-operatively at 1 week, at 1 month, at 6 months and at 1 year. On follow up detail history was taken in which patients were asked about relieval of preoperative symptoms and development of any new symptoms. Complete neurological examination was done at each follow-up. Those patients who developed recurrence of pain or any other complication were requested MRI spine. Drug prescriptions were revised and drugs were continued, added or removed from prescription based on the drug response of individual patient. The patients who were treated conservatively, were treated for 8 weeks with gabapentin (100 mg B.D), naproxen (500mg B.D), tizanidine (4 mg B.D), omeprazole (40 mg O.D), and methyl cobalamin (1000 mg O.D). The patients with poor motor function and myelopathy were subjected to surgery without giving conservative treatment.

RESULTS

Total numbers of patients were 1058. Males were 708 (66.9%) and females were 350 (33.1%). The frequencies of males were higher with male to female ratio of 2.02. The frequency and the percentage of the patients belonging to different age groups are given below in the table-1. The lumbar disc prolapse was common in the patients of Group C (30–39) and was 37.5%. This was followed by age group-D (40–49) in terms of frequency of patients and was 23.9%.

The different signs and symptoms which formed the clinical presentation of the patients were backache, unilateral sciatica, bilateral sciatica, backache with sciatica, foot drop, neurogenic claudication, neurogenic claudication with Sciatica, numbness, paraparesis. The most common symptom seen in the patients of lumber disc prolapse was backache (28.8%) followed by sciatica (right side sciatica 22.3%, left side sciatica 24.5% and bilateral sciatica 12.5%) and neurogenic claudication (5.1%).

The level of disc prolapse was confirmed on MRI scan of vertebral column. The relative frequencies of various intervertebral disc spaces involved in disc prolapse are given in the table-3. Most commonly affected disc spaces were L5/S1 (34.6%), L4/L5 (33.4%) and both L4/L5, L5/S1 (19.5%). Multilevel intervertebral disc space (1.89%) involvement and L2/L3 (1.1%) disc space involvement were rarely seen.

Most of the patients, 499 (47.2%) were conservatively treated. The conservative treatment was given for 8 weeks with gabapentin (100 mg B.D), naproxen (500 mg B.D), tizanidine (4 mg B.D), omeprazole (40 mg O.D), and methyl cobalamin (1000 mg O.D). Patients were advised to quit smoking, lose weight and to have bed rest and traction for no more than 2 weeks. Rest of the patients, 559 (52.8%) underwent some type of surgery. Most of the patients who underwent surgery were treated with discectomy combine with fenestration (32.04% of total operated patients). In 32 cases (3.02%), which underwent the procedure of discectomy combined with hemilaminectomy and facetectomy, transpedicular screw fixation was done using polyaxial titanium pedicular screws and rods. Causative factors were circumferential stenosis including facet hypertrophy, flavum thickening and stenosis. The relative frequency of different surgeries performed is given in the table-4.

Total number of patients was 1058 and number of patients operated was 559 (52.8%). Complications of surgeries noted in our study were recurrence of symptoms, residual symptoms, mechanical backache, Implant failure and infections. Recurrence of symptoms was noted after one year.

Table-1: Frequency of patients in various age groups

Age group	Female	Male	Frequency	Percentage
A (0–20)	10	9	19	1.8%
B (21–29)	28	131	159	15%
C (30–39)	93	304	397	37.5%
D (40–49)	101	152	253	23.9%
E (50–59)	69	55	124	11.7%
F (60–69)	40	38	78	7.4%
G (7O≥	9	19	28	2.6%
Total	350	708	1058	100%

Table-2: Clinical signs and symptoms of lumbar PID in the patients

Signs and Symptoms	Frequency	Percentage
Backache	305	28.8%
Backache + Bilateral sciatica	6	0.56%
Backache + Left sciatica	4	0.37%
Backache + Right sciatica	6	0.6%
Bilateral sciatica	133	12.5%
Foot drop	5	0.47%
Left side sciatica	260	24.5%
Neurogenic claudication	54	5.1%
Neurogenic Claudication + Sciatica	27	2.5%
Numbness in left leg	4	0.37%
Numbness in right leg	2	0.18%
Paraparesis	4	0.37%
Right side sciatica	236	22.3%
Total	1058	100.0%

Table-3: Levels of prolapsed intervertebral disc in the patients

Level of Disc Prolapse	Females	Males	Total	Percentage
L5/S1	98	268	366	34.6%
L4/L5	116	237	353	33.4%
L2/L3	5	7	12	1.1%
L3/L4	8	14	22	2.1%
L3/L4, L4/L5	20	30	50	4.7%
L4/L5, L5/S1	90	116	206	19.5%
L3/L4, L4/L5, L5/S1	8	21	29	2.7%
Multilevel stenosis	5	15	20	1.89%
Total	350	708	1058	100.0%

Table-4: Modalities of treatment

Modality of Treatment	Frequency	Percentage
Conservative	499	47.16%
Discectomy + Extended fenestration	188	17.76%
Discectomy + Fenestration	339	32.04%
Discectomy + Hemilaminectomy + Facetectomy	32	3.02%
Total	1058	100.0

Table-5: Complications of surgery for Lumbar PID

Complications	Frequency	Percentage
Recurrence of symptoms	11	1.96%
Mechanical backache	27	4.8%
Implant failure	3	0.53%
Residual symptoms	2	0.35%
Discitis	1	0.17%
Total operated	559	100%

DISCUSSION

Our study was conducted in the two tertiary care hospitals in Baluchistan and Khyber Pakhtunkhwa provinces of Pakistan. It was conducted to have sound knowledge of epidemiological characteristics of lumbar prolapsed intervertebral disc in the regions. In our study age distribution of patients, gender distribution of patients, clinical presentation of patients, types of treatment, types of surgeries done on the patients and postoperative complications of lumbar disc prolapse were studied. 1058 patients were included in our study. All were cases of lumbar disc prolapse proven through MRI scans of the spine. Out of total patients males were 708 (66.9%) and females were 350 (33.1%). The frequencies of males were higher with male to female ratio of 2.02. The increased frequency of males was also seen in two other studies. One performed in India by R Prasad[8], 65.6% were males and 34.4% were females and other in Isfahan University of Medical Sciences by H MOEIN[9], males constituted 71% of the patients and females constituted 29%. Lumbar disc prolapse in Kenya by K Ongeti[10] was more common in females.

When age was considered, lumbar disc prolapse was found to be common in Age group C (30–39 years.) 37.5% and Age group D (40–49 yrs.) 23.9%. Similarly considering gender, lumbar disc prolapse was common in males in Age group C (30–39) 42.9% and in females it was common in Age group D (40–49) 28.8%. Indian study by R Prasad[8] showed that age of presentation for prolapsed disc in male was 21–30 years (31.88%) and in female was 31–40 years (48.83%). The Indian study by R Prasad[8] showed that prolapsed disc was common in younger ages as compare to our study. Lumbar disc prolapse has various presentations. Pressure on ligaments commonly causes backache, pressure on nerve roots leads to sciatica, numbness, paraesthesia, muscle weakness and urinary retention. Various signs and symptoms noted in our study are shown in table-2. The most commonly seen symptoms in the patients of lumber disc prolapse were backache(28.8%) followed by sciatica (right side sciatica 22.3%, left side sciatica 24.5% and bilateral sciatica 12.5%) and neurogenic claudication (5.1%).

When the level of presentation was taken into consideration most commonly affected disc spaces were at L5/S1 level (34.6%), L4/L5 level (33.4%) and (24.2%) of patients had disc involvement at 2 levels. In Indian study by R Prasad[8], disc prolapse was seen to be most common at the level of L4/L5 (34.4%), which was then followed by the disc prolapse at L5-S1 level (26.7%). In study at Isfahan University by H MOEIN[9] 61% of patients had disc prolapsed at L4-L5 level and 32% of patients had disc herniation at two levels. This means disc prolapse is common at the level of L4/L5 and L5/S1 intervertebral disc space in our study as well as other studies.[8,9] There are two main stays of treatment for lumbar disc prolapse, conservative and surgery.[11] Some of the patients (47.2%) were conservatively treated in our study while rest of the patients 559 (52.8%) underwent some type of surgery. Excision of disc provides rapid relief of sciatica and lower back pain.[12] Discectomy, laminectomy, facetectomy and fenestration procedures are mainly done in our centres. Most of the patients who underwent surgery were treated with discectomy combine with fenestration (32.04% of total operated patients). The relative frequency of different surgeries performed is given in the table-4. The results of our study are

comparable to a local study by Siddiq, M[13] *et al* for operative treatment of disc prolapse. (75%) were men and (25%) were female in this study[13] while in our's study (66.9%) were males and (33.1%) were females. In the local study[13], most of the affected patients were in 4th and 5th decade of life which was similar to our results in which (61.4%) of patients were in 4th and 5th decade. In this study[13], most commonly affected disc space was L4/L5 (56.25%) while in our study L5/S1 (34.6%) was commonly affected. The complications noted in the study[13] were dural tear (6.25%), discitis (3.12%), wound infection (2.12%) and cautery burns (6.25%). Complications of surgeries noted in our study were recurrence of symptoms (1.96%), residual symptoms (0.35%), mechanical backache (4.8%), Implant failure (0.53%) and infection, i.e., discitis (0.17%). Most of our patients (92.19%) didn't have any complication after surgery. Success rate of lumbar disc surgery generally ranges from 46–96%[14] and outcome depends on patient selection than on surgical technique[15]. When a standard discectomy is used the outcome of various surgical procedures is not much different with 85% success rate and 95% of patients with successful surgery return to work.[16] Long term outcome of standard discectomy is favourable.[17]

Another local study, which was conducted in the Fauji Foundation hospital of Rawalpindi[18], long term results of disc prolapse surgery were studied. In immediate post–operative period, complete relief of pain was observed in (79.41%) of patients. In few patients (14.7%), surgery failed to give any pain relief, and in (5.88%) it yielded partial pain relief. On follow up it was noted that (12.82%) of patients suffered from recurrence of pain in the first year, (35.89%) in the 5 years and (51.28%) after 10 years. It was concluded from this study[18] that surgery provided immediate pain relief in 79.41% of patients, but on long-term follow up the results of lumbar disc surgery were found to be non-satisfactory. In our study the results were excellent and complete relief of pain was seen in (92.19%) of operated patients at 1 month follow up.

CONCLUSION

Our research showed that Lumbar PID is common in the age group of 30–49 years. It occurred most commonly at the level of L4/L5 and L5/S1. Common presentation is with Backache and Sciatica. Some of the patients are treated conservatively while others undergo some type of surgery. The results of surgery are very good at our centres with greater than 92% being free of postoperative complications.

AUTHOR'S CONTRIBUTION

MJ: Contribution to conception, design and acquisition of data, final approval of the article. MUR: Contribution to analysis and interpretation of data, drafting of the article, revision of article for intellectual content. AA: Contribution to drafting of the article. SSB: Contribution to final approval of the article. AK: Contribution to final approval of the article

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