

## Frequency of Cauda Equina Syndrome in Patients with Lumbar Disc Herniation

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### ABSTRACT

**Introduction:** *Herniation of the lumbar inter-vertebral disc can cause severe compression of the cauda equina. A precise understanding of this syndrome is important because any delay in diagnosis and treatment may result in poor outcome.*

**Objective:** *The objective of this study is to determine the frequency of Cauda Equina Syndrome in patients with lumbar disc herniation.*

**Materials and Methods:** *This cross sectional descriptive study was conducted at Department of Neurosurgery, Postgraduate Medical Institute Lady Reading Hospital, Peshawar. A total of 127 patients of cauda equina syndrome were taken through convenience (non-probability) sampling, in a period of six months (from November, 2010 to May 2011). Patients of both genders presented with unilateral or bilateral foot drop, ankle areflexia, saddle anesthesia and urinary incontinence due to lumbar disc herniation were included while patients with spinal tumors, lumbar Spinal stenosis and recurrent disc herniation were excluded. The data was analyzed using the statistical program SPSS version 10.*

**Results:** *Out of 127 patients majority of the patients were male i.e. 65.35% (n = 83) 44.65% were female. Most of the patients were between 31 – 40 years of age followed by 20 – 30 years, 29.92% (n = 38). Frequency of cauda equina syndrome in patients with lumbar disc herniation was found in 11.02% (n = 14).*

**Conclusion:** *The relationship between Cauda Equina Syndrome was found with lumbar disc herniation and the frequency was found in accordance to other studies. Cauda Equina Syndrome is most common in the patients between 31 – 40 years of age, followed by 20 – 30 years of age. Gender distribution of the patients showed that majority of the patients were male. Frequency of cauda equina syndrome in patients with lumbar disc herniation was 11%.*

**Key Words:** *Frequency, Cauda Equina Syndrome, Lumbar disc herniation.*

### INTRODUCTION

Cauda Equina Syndrome is considered a Neurosurgical Emergency because if left untreated it can lead to permanent loss of bowel bladder control and paralysis of the legs.<sup>1</sup> Cauda Equina Syndrome is a complex of clinical symptoms and signs most commonly secondary to a massive prolapsed intervertebral disc.<sup>2</sup>

The reported frequency of cauda equina syndrome resulting from herniated lumbar disc is 30%.<sup>3</sup> The generally accepted incidence of Cauda Equina Syndrome

is 2 – 6% in all Laminectomies performed for lumbar disc herniation.<sup>4</sup>

Although the clinical presentation varies according to the involved nerve roots, the salient clinical features include altered perineal sensations and disturbance of bowel and bladder function.<sup>5</sup> Numerous causes of Cauda equina syndrome has been reported including disc herniation, spinal stenosis, spinal tumour and trauma.<sup>6</sup>

Magnetic Resonance Imaging of the lumbosacral

region is the investigation of choice.<sup>7</sup> This condition is treated by prompt surgical decompression via performing wide Laminectomy and removing the inflicting disc fragment.<sup>8</sup> The prognosis of Cauda equina syndrome improves if a definite cause is identified and appropriate treatment provided early in the course.<sup>9</sup>

Because of the limited local studies on frequency of Cauda Equina Syndrome in patients with lumbar disc herniation, however, this study was conducted and the result of this study were shared with neurophysician and surgeons so that while examining the patients with lumbar disc herniation. By diagnosing the cauda equina syndrome in time, it may prevent the permanent loss of bowel bladder control and paralysis of legs by timely surgical intervention and thus improving the outcome.

### MATERIALS AND METHODS

This cross – sectional descriptive study was conducted at the Department of Neurosurgery, Postgraduate Medical Institute Lady Reading Hospital, Peshawar. Sample size was 127 keeping population proportion of Cauda Equina Syndrome at 30%. Taking Confidence interval to be 95%, and absolute precision required at 8%. The duration was six months (from November, 2010 to May, 2011).

#### Inclusion Criteria

Patients of both genders presented with unilateral or bilateral foot drop, ankle areflexia, saddle anesthesia and urinary incontinence due to lumbar disc herniation confirmed by Magnetic Resonance Imaging (MRI) were included in the study.

#### Exclusion Criteria

Patients with the following conditions were excluded from the study.

1. Spinal tumors because of its insidious onset and prolonged course.
2. Lumbar Spinal stenosis because of long history and gradual presentation of symptoms.
3. Recurrent disc herniation because of previous lumbar disc surgery.

After permission from hospital ethical committee, patients with lumbar disc herniation presenting to Neurosurgery Department of this institute through outpatient and emergency department were approached. Those who fulfill selection criteria were included in the study. Informed consent was taken from all patients.

These patients were further assessed through detailed history, including personal particulars, name, age, sex, address, symptoms and thorough clinical examination including tone, power, deep tendon reflexes, and sensations of lower limbs and evaluation of bowel and bladder function. Diagnosis of lumbar disc herniation was made on MRI findings which showed dehydrated disc and thecal sac compression. From all patients, detailed history, detailed neurological and systemic examination was done to detect Cauda Equina Syndrome. All MRI were reported by a single expert radiologist who was the fellow of CPSP. All data was recorded in a predesigned proforma. Strictly exclusion criteria were followed to control confounders and bias in the study results.

The data was analyzed using the statistical program SPSS version 10. Descriptive statistics like mean ± standard deviation was used for age, frequency / percentage, sex and MRI findings. Cauda Equina Syndrome was stratified among the age, gender and level of herniated disc on MRI to see the effect modifiers. The data was represented in tables for different variables.

### RESULTS

A total of 127 patients were included to determine the frequency of Cauda Equina Syndrome in patients with lumbar disc herniation.

#### Sex Incidence

Gender distribution of the patients shows that majority of the patients were male i.e. 65.35% (n = 83) and 34.65% (n = 44) were female (Figure 1).

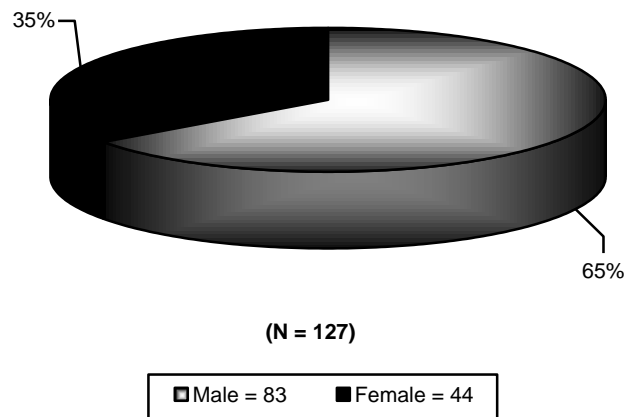


Figure 1: Gender Distribution (n = 127).

**Age Incidence**

Age distribution of the patients show, increased number of patients between 31 – 40 years of age, 20 – 30 years age group was the second common group which reveals 29.92% (n = 38) and only 10.24% (n = 13) were recorded between 41 – 50 years of age. Mean and standard deviation was recorded in  $36.75 \pm 4.52$  (Table 1).

**Table 1:** Age Incidence (n = 127).

Age (in years)	No. of patients	Percentage
20 – 30	38	29.92
31 – 40	76	59.84
41 – 50	13	10.24
Total	127	100
Mean and S.D.	$36.75 \pm 4.52$	

**Frequency of Cauda Equina Syndrome**

Frequency of cauda equina syndrome in patients with lumbar disc herniation was found in 11.02% (n = 14) and 62.20% (n = 79) had no complaint of CES (Table 2).

**Table 2:** Frequency of Cauda Equina Syndrome in Patients with Lumbar Disc Herniation (n = 127).

Cauda Equina Syndrome	No. of patients	Percentage
Yes	14	11.02
No	79	62.20
Total	127	100

**DISCUSSION**

More than 95% of uncomplicated herniated lumbar disc can be treated conservatively initially which consists of bed rest, use of non-steroidal anti-inflammatory drugs, muscle relaxants and physiotherapy. Surgery reserved for patients who experience worsening of neurologic symptoms or failure to clinically improve after an appropriate minimum of 6 weeks of conservative medical therapy. In contrast, cauda equina syndrome is a severe neurologic disorder that can

result from lumbar disc herniation with excessive compression on the cauda equina, so it was considered one of the few surgical emergencies which requires an acute surgical decompression.<sup>10-14</sup>

Though precise understanding of the pathophysiology and optimal treatments including the best timing and the extent of surgery has yet to be elucidated for cauda equina syndrome.<sup>13,14</sup>

Limited local studies on frequency of Cauda Equina Syndrome in patients with lumbar disc herniation are done, and the result of this study may be shared with neuro-physician and surgeons so that while examining the patients with lumbar disc herniation, they should have the odds of cauda equine syndrome in patients and get confirmed by appropriate tests whether cauda equine syndrome is there or not. By diagnosing the cauda equine syndrome in time, they may prevent the permanent loss of bowel bladder control and paralysis of legs by timely surgical intervention and thus improving the outcome.

In our study, we found 11.02% (n = 14) patients with cauda equina syndrome presented with lumbar disc herniation. Chang HS,<sup>15</sup> conducted a study with the view to find out the lumbar herniated disc presenting with cauda equina syndrome and its Long-term follow-up of four cases. They found 2.8% of the patients of CES with lumbar disc herniation.

On the other hand, Ma B,<sup>16</sup> conducted a study to review the literature on the clinical progress in cauda equina syndrome (CES), including the epidemic history, pathogenesis, diagnosis, treatment policy and prognosis and found that CES is rare, both a traumatically and traumatically. Males and females are equally affected. The incidence of CES is variable, depending on the etiology of the syndrome. The most common cause of CES is herniation of a lumbar intervertebral disc.

Some researchers<sup>10-12</sup> have reported a 2.2% incidence of cauda equina syndrome (CES) following disc herniation in the lumbar spine. Others<sup>12-14</sup> have reported an incidence of 3.2%, although they believed that this represented an overestimate because it did not include the majority of patients with lumbar disc prolapse who had undergone nonsurgical treatment. The generally accepted frequency of CES is between 2 – 6% of all laminectomies performed for lumbar disc herniation.

Though, in our study we found some higher frequency of CES in patients with lumbar disc herniation, but this is not very higher and the reason behind this slight higher increased frequency may be due to the

late presentation of the patients to the health care professionals.

The primary goal in the treatment of cauda equina syndrome is to detect and diagnosis early, and to perform surgery with adequate decompression.

## CONCLUSION

Following are the main concluding points:

1. Cauda Equina Syndrome is most common in the patients between 31 – 40 years of age, followed by 20 – 30 years of age.
2. Gender distribution of the patients shows that majority of the patients were male i.e. 65.35% (n = 83) and 34.65% (n = 44) were female.
3. Frequency of cauda equina syndrome in patients with lumbar disc herniation was found in 11.02% (n = 14).

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