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A STUDY ON CLINICAL PROFILE OF PATIENTS WITH INTER VERTEBRAL DISC PROLAPSE

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Abstract

Pain is the most common complaint. Axial back pain is typically present, although some patients do not have this complaint. Radicular pain is more typical and often the more "treatable" ofthe complaints. The pattern of lower extremity radiation depends on the level of the herniation. Lower lumbar or lumbosacral disc herniations can lead to the classic symptoms of pain radiating below the knee. Often pain extends into the foot and can follow a dermatomal distribution. S1 radicular pain may radiate to the back of the calf or the lateral aspect or sole of the foot. L5 radicular pain can lead to symptoms on the dorsum of the foot. Adult patients of either sex with intervertebral disc prolapse with or without neurological deficit, visiting or admitted were taken into the study. Patients with cauda equina syndrome were excluded from study. A total of 160 patients were included in the study. Patients with signs and symptoms of disc prolapse and who come under the inclusion criteria and give informed written consent were selected. Majority of our patients have disc prolapse at more than one level (65%) i.e. disc prolapse involving combination of L4-L5 & L5-S1, L3-L4 & L5-S1 etc. and others have disc prolapse at L4-L5 (23.1%) and L5-S1 (11.9%). No patients had disc prolapse at only level L1-L2, L2-L3 and L3-L4. There is no significant difference in distribution between the groups with respect to level of disc prolapse. (p=0.421).

Keywords: Inter vertebral disc prolapse, radicular pain, disc herniation

Introduction

Disc herniation is one stage of the lumbar degenerative cascade. It is considered one of the earlier stages, following internal disc disruption. Herniation occurs through a tear in the anulus fibrosus. The anulus is the thick outer layer that normally withstands tensile forces transferred from the compressed nucleus pulposus. Force transfer works only if the nucleus-anulus- endplate complex acts as a closed volume system. Normally, compression across the disc space leads to increased pressure within the nucleus[1].The soft nucleus deforms and flattens, pushing against the annular fibers, which then generates tensile hoop stresses. The circumferential fibers are placed under tension, dissipating stresses and containing the annulus.With disruption of the anulus, the soft nucleus can be pushed through (i.e., herniated) if placed under sufficient pressure. The nucleus must be fluid, or "dynamic," enough to permit herniation to occur. Discs in younger individuals that have a well-hydrated nucleus are more likely to herniate. Older patients with desiccated discs are less prone to herniation[2].The ejected portion is typically a fibrocartilaginous fragment. In some cases, a piece of anulus or endplate fibrocartilage can be associated with it. In juveniles, an apparent herniation may represent a Salter type II fracture of the vertebral ring apophysis with its attached anulus.

When a portion of the nucleus is ejected, disc mechanics are altered. Frei and colleagues showed that nucleotomy alters the loading pattern across the disc space, with the annulus sustaining higher compression forces than normal. This situation can lead to increases in endplate pressures along the periphery where the anulus attaches to the bone. Chondro osseous metaplasticchanges such as osteophytes or sclerosis in these regions are a response to long-standing abnormal loading patterns. The exact inciting event leading to disc herniation is unknown. Some authors believe that an acute traumatic episode leads to displacement of the disc, although this is most likely related to force imparted onto a previously degenerated disc, which has developed a focal annular weakness. Acute sciatica from a disc herniation is often associated with a prodromal history of back pain[3].

Postural variations can influence intradiscal pressures. The highest pressures have been recorded in patients with the torso forward flexed with weight in hand. In an elegant biomechanical study, Wilder and colleagues found that combined lateral bend, flexion, and axial rotation with 15 minutes of exposure to vibration can lead to tears extending from the nucleus across the anulus. This finding may have significance for occupations with exposure

to long periods of vibratory stimuli, such as truck drivers and machine workers.
Many patients describe a prodromal history of long-standing mild to moderate back pain. Although trauma is not the only component leading to a disc herniation, some patients describe a specific incident attributable to the onset of leg and back pain. This incident may be a fall, a twist, or lifting of a heavy item. Specific postures can lead to exponential increases in intradiscal pressure, which can predispose to disc injury. Exposure to vibrational energy combined with sustained lateral flexion and rotation may also predispose to herniation. The exact history of the incident and the presence of pre-existent back or leg pain must be explored; this is particularly important for work-related injuries[4].
Pain is the most common complaint. Axial back pain is typically present, although some patients do not have this complaint. Radicular pain is more typical and often the more "treatable" of the complaints. The pattern of lower extremity radiation depends on the level of the herniation. Lower lumbar or lumbosacral disc herniations can lead to the classic symptoms of pain radiating below the knee. Often pain extends into the foot and can follow a dermatomal distribution. S1 radicular pain may radiate to the back of the calf or the lateral aspect or sole of the foot. L5 radicular pain can lead to symptoms on the dorsum of the foot. Radiculopathy from the involvement of the upper lumbar roots can lead to more proximal symptoms. L2 and L3 radiculopathy can produce anterior or medial thigh and groin pain. Groin pain may also be indicative of L1 pathology. Radicular pain can be difficult to discern and is often not "classic." Many patients do not exhibit pain in a specific dermatomal distribution, or the radiation does not extend along the entire leg. It may radiate only into the hip region or just the foot or any portion of the leg[5, 6].

Methodology

Adult patients of either sex with intervertebral disc prolapse with or without neurological deficit visiting or admitted were taken into the study. Patients with cauda equina syndrome were excluded from study. A total of 160 patients were included in the study.Patients with signs and symptoms of disc prolapse, and who come under the inclusion criteria and give informed written consent were selected. After the clinical assessment, investigations of the patients will be done, which includes routine CBC, ESR, CRP, X rays of Lumbar spineboth in AP and Lateral views, flexed and extension views, MRI. X rays were done to rule out other causes of back pain like tumours, instability, spondylolisthesis, infections, osteoporosis, thoracolumbar fractures. MRI is done to assess nerve root compression, level and stage of disc prolapse. Following MRI disc prolapse will be confirmed.

Inclusion criteria

1) Patients with acute onset and chronic low back pain, with or without axial pain, with or without neurological deficits and patients in whom disc prolapse is confirmed by MRI were included in the study.
2) Above 18 years of age of both sex.
3) Positive straight leg raising test, with or without presence of crossed SLRT.
4) Patients who are willing to give consent.

Exclusion criteria

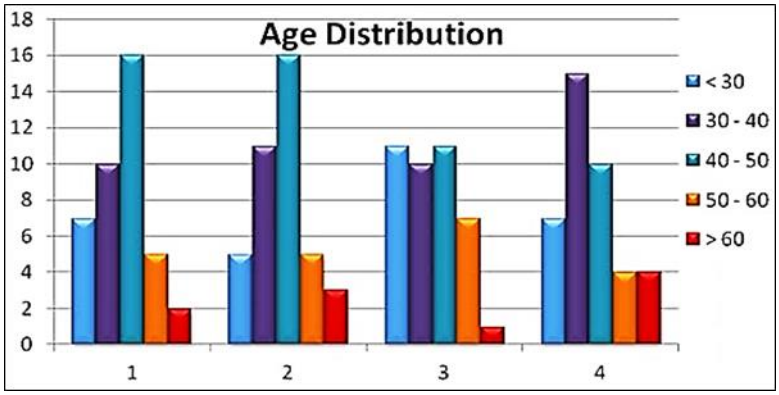
1) Traumatic thoraco-lumbar injuries.
2) Lumbar-canal stenosis diagnosed clinically or by MRI.
3) Spondylolisthesis patients.
4) Patients with Peripheral neuropathy.
5) Patients with Infective conditions.
6) Spinal tumors, both primary and metastasis are excluded.
7) Pregnancy.
8) Patients requiring urgent surgery i.e. unbearable pain, progression of neurological deficits, cauda equina syndrome.

Then patients were randomized using computer generated randomization software into 4 groups depending on the treatment modality they receive.

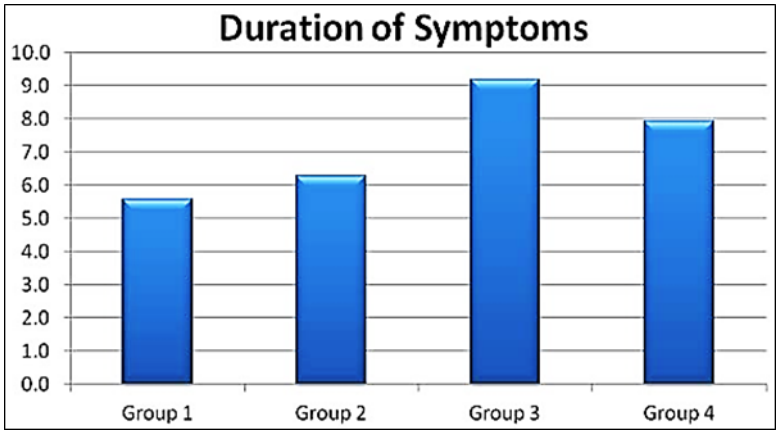
1) Group I consists of patients who receive bed rest for one week.
2) Group II consists of patients with continued routine daily activities and pain treated with analgesics i.e. paracetamol, up to 4 grams per day/NSAIDS.
3) Group III patients received back school exercises with back education which includes functional anatomy of back, biomechanics of spine, ideal postures and pain treated with analgesics i.e. paracetamol, up to 4 grams per day/NSAIDS.
4) Group IV includes patients who receive McKenzie method of treatment based on McKenzie classification,

and pain treated with analgesics i.e. paracetamol, up to 4 grams per day/NSAIDS.

Results

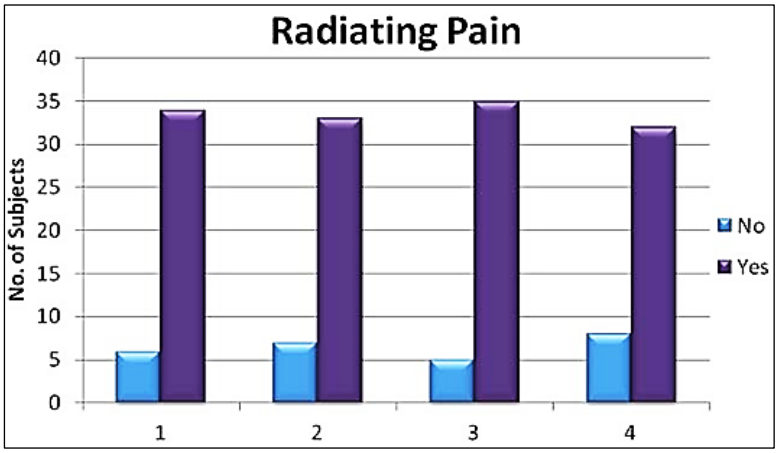


Graph 1: Age Distribution In our study majority of cases were in the age group between 30- 50 years in each group and also in all the groups together. This is shown in Graph 1. There is no significant difference in distribution between the groups with respect to age (p=0.683)



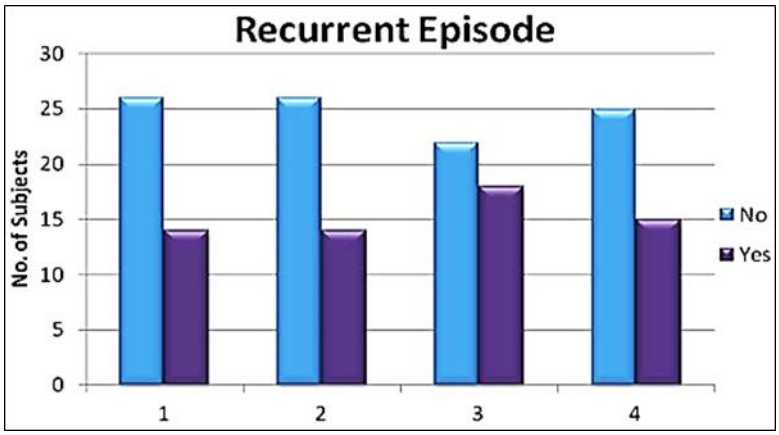
Graph 2: Duration of Symptoms in Months

Mean duration of symptoms (in months) in four groups is shown in Graph2. There is no significant difference in distribution between the groups with respect to duration of symptoms. (p=0.245)



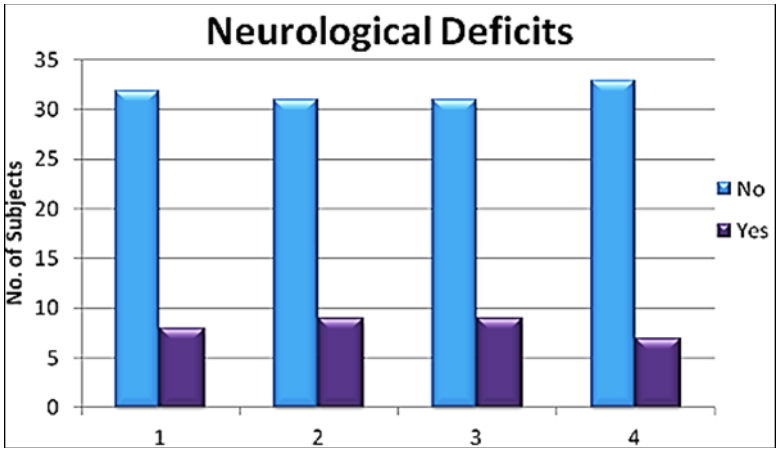
Graph 3: Radicular Pain

34 (85%) patients in group 1, 33(82.5%) patients in group 2, 35 (87.5) patients in group 3, 32 (80%) patients in group 4 have radicular pain radiating to lower limbs. There is no significant difference in distribution between the groups with respect to Radicular pain. (p=0.821)



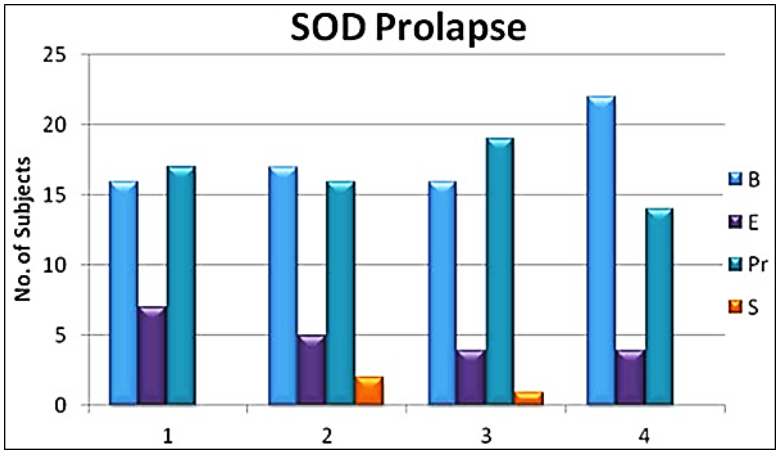
Graph 4: Recurrent Episodes

14 (35%) patients in group 1, 14(35%) patients in group 2, 18 (45%) patients in group 3, 15 (37.5%) patients in group 4 have had recurrent episodes of back pain. There is no significant difference in distribution between the groups with respect to recurrent episodes. (p=0.768)



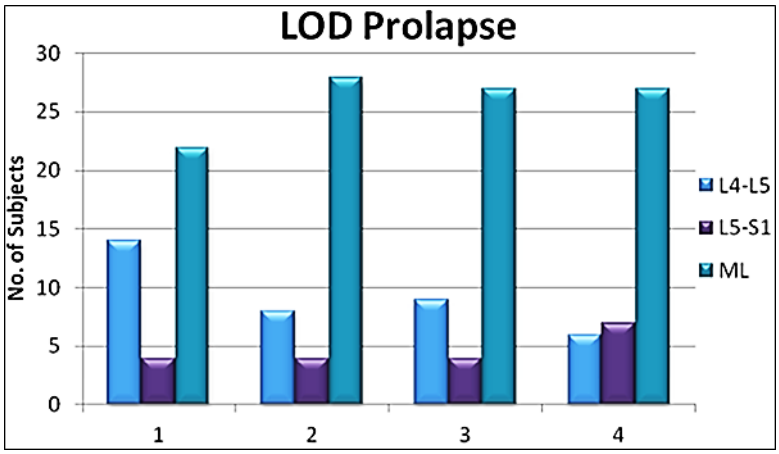
Graph 5: Neurological Deficits

8 (20%) patients in group 1, 9 (22.5%) patients in group 2, 9 (22.5) patients in group 3, 7 (17.5%) patients in group 4 have neurological deficits in lower limbs. There is no significant difference in distribution between the groups with respect to presence or absence of neurological deficits. (p=0.936)



Graph 6: Stage of Disc Prolapse

Majority of our patients have disc bulge (44.4%) and disc protrusion (41.2%). Few patients have disc extrusion (12.5%) and sequestration (1.9%). There is no significant difference in distribution between the groups with respect to stage of disc prolapse. (p=0.36



Graph 7: Level of Disc Prolapse

Majority of our patients have disc prolapse at more than one level (65%) i.e. disc prolapse involving combination of L4-L5 & L5-S1, L3-L4 & L5-S1 etc. and others have disc prolapse at L4-L5 (23.1%) and L5-S1 (11.9%). No patients had disc prolapse at only level L1-L2, L2-L3 and L3-L4. There is no significant difference in distribution between the groups with respect to level of disc prolapse. (p=0.421)

Discussion

In our study mean duration of symptoms was 5.6 months in bed rest group, 6.3 months in continued routine activity group; 9.2 months in back school group and 7.9 months in McKenzie group. In the study of Deyo*etal*. [7] it was 10 days in group 1 (2 days bed rest) and 7days in group 2 (7 days of bed rest). In study of Malmivaara*et al*. [8] it was 4.7 days in bed rest group, 5.1 days in exercise group and 4.5 days in continued routine activity group. In study of Sahin*etal*. [9] it was 6.48 months in back school group and 7.33 months in the control group. In study of Narciso *et al*. [10] it was 24 months in back school group and 21 months in the McKenzie group.Our study closely resembles Sahin*et al*. where the mean duration of symptoms for low back pain is 6 to 9 months.
In our study 85% in bed rest group, 82.5% in continue routine activity group, 87.5% of back school group and 80% of McKenzie group had radiation of pain to lower limbs. In the study of Deyo*etal*. [7] 37% in group 1 (2 days bed rest) and 47% in group 2 (7 days of bed rest) had radiation of pain to lower limbs. In study of Malmivaara*et al*. [8] 21% in bed rest group, 10% days in exercise group and 9% in continued routine activity group) had radiation of pain to lower limbs.In contradictory to other studies, our study has much higher percentage of radicular pain. This is probably because, other studies are conducted on patients with non-specific low back pain and our study is on low back pain due to disc prolapse.
In our study 35% in bed rest group, 35% in continue routine activity group, 45% of back school group and 37.5% of McKenzie group had recurrent episodes of back pain. In study of Malmivaara*et al*. [8] 16% in bed rest group, 15% in continue routine activity group and 27% months in the back school group had recurrent episodes of back pain. In study of Narciso *etal*.[10] 46% in back school group and 47% months in the McKenzie group had recurrent episodes of back pain.Our study closely resembles Narciso *et al*. [10] where 35 to 45% had recurrent episodes of low back pain.
In our study 44.4% patients have disc bulge, 41.2% patients have disc protrusion, 12.5% patients have disc extrusion and 1.9% patients have disc sequestration. It is similar to the study by Spengler and colleagues where most common stage of disc prolapse is bulge or protrusion.

Conclusion

Majority of patients with disc prolapse have radicular pain. Significant number of patients has recurrent episodes of low back ache and also many patients underwent some form of treatment before presentation to us. 20% of patients have neurological deficits at presentation.

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