ABSTRACT

Objective: Acute disc herniation (DH) is a common cause of low back pain (LBP). It ranks fifth in the category of diseases in terms of cost of hospital care. It has higher indirect costs due to absenteeism from work and disability than any other disease. The present study was performed to assess the clinical outcomes of non-surgically treated LBP patients after 6 months of follow-up.

Methods: The present study was a prospective study which was performed on 450 lumbar radicular patients visiting the neurosurgery outpatient department having clinical signs and symptoms of acute lumbar DH of less than 3 months duration. Their diagnosis was confirmed by magnetic resonance imaging. The patients were treated conservatively during 6 months. Pain and disability were assessed by visual analog scale (VAS) and Oswestry disability questionnaire, respectively.

Results: About 135 (30%) female and 315 (70%) male participated in the study. During the follow-up period, 27 (06%) patients (21 male and 6 female) showed poor response to conservative treatment and motor weakness and underwent surgical intervention. A significant improvement in the VAS Score was seen after 6 months of conservative treatment than initial evaluation of patients (3.12±1.84, 7.1±1.43, p=0.00). Furthermore, significant improvement in disability score of patients was seen in follow-up period (25.82±16.92, 53.66±17.66; p=0.00).

Conclusion: Results of our study showed that conservative treatment in patients of acute lumbar DH have significant improvement in pain relief and disability without any notable side effect.

Keywords: Conservative treatment, Low back pain, Disc herniation, Lumbar radicular pain.

INTRODUCTION

Low back pain (LBP) is a common condition in younger than 50 years of age. The economic burden of lumbar-spine disorders is heavy [1]. It ranks fifth in the category of diseases in terms of cost of hospital care. It has higher indirect costs due to absenteeism from work and disability than any other disease [2]. LBP due to acute lumbar disc herniation (DH) is common disorder at the ages of 40–50 year. Main symptom being radiating pain in the area of the leg typically served by one nerve root in the lumbar or sacral spine [1,2]. Several treatment modalities including surgical and conservative are being applied for these patients. Cauda equina syndrome is the single absolute indication for surgery in a LBP patient [3-5]. Maximum patients of acute DH improved with conservative treatment such as bed rest, life style modification, medication, back support, exercise, manipulation, and physical therapy [6,7].

Different studies have reported that conservative treatment with non-steroidal anti-inflammatory drug (NSAID) cause pain relief in patients with DH. The same studies showed that oral steroid did not have useful impacts on acute lumbar DH [8,9]. Some study used muscle relaxant in acute LBP [9]. Patients who were non responsive to conservative treatment or had contraindications for surgery epidural injection was tried [9-12]. The present study was performed to assess the clinical outcomes of non-surgically treated LBP patients after 6 months of follow-up.

METHODS

The present study was prospective study which was performed on 450 lumbar radicular patients visiting the Neurosurgery outpatient department having clinical signs and symptoms of acute lumbar DH of <3 months duration who were confirmed by magnetic resonance imaging (MRI). All these patients were offered surgery and conservative management. Only those patients who were unwilling for surgery and opted for conservative management were included in this study. These patients were on regular follow-up at Neurosurgery clinic of Command Hospital Lucknow.

Study samples

Consecutive sampling of patients was done. Consent both verbal and written was obtained from all patients. All patients were assessed by neurologic and lumbar movement examination, detection of muscle force and straight leg raising test (SLR). MRI was done for all patients and if they had DH, they were included in this study. Patients with degenerative or spinal canal stenosis, tumor, trauma, infection, spondylolisthesis or signs and symptoms of neurologic deficit were excluded from the present study.

Study design

All patients were visited by neurosurgeon and MRI imaging studies were used for diagnosis confirmation. An independent research physician verified symptoms and signs of selected patients at the time of enrollment. Patients with acute lumbar DH were included. Clinical evaluations was performed by SLR test, muscle strength, reflexes (Patellar and Achilles), sensory changes, the Oswestry Disability Questionnaire (ODQ), 100-mm visual-analogue scale initially and after following for 6 months.

Study period

A prospective study was conducted for 24 months from April 2019 to March 2021.
Conservative treatment

After initial evaluation of each patient conservative treatments such as life style modification, bed rest, drug therapy with NSAIDs, muscle relaxant, tricyclic antidepressants, and physiotherapy were prescribed.

Statistical analysis

Mann-Whitney and Wilcoxon test were used to analyze study data using SPSS software 14.0. Significant difference between study variables was detected using Two-tailed significance level of 0.05.

RESULTS

About 135 (30%) female and 315 (70%) male included in the study. 252 patients (56%) had disc extrusion (DE) and 198 (44%) patients had DH. The most affected level in patients with DE and DH was L4-L5 (Table 1). A significant improvement in the visual analog scale (VAS) Score was seen after 6 months of conservative treatment than initial evaluation of patients (3.12±1.84, 7.1±1.43; p=0.00) (Table 2).

Mean of SLR degree in study patients after 6 months follow-up significantly improved in comparison with initial evaluation (68.22±15.67, 43±11.93; p=0.00). In initial evaluation DE patients had no significant difference in mean of SLR degree as compared to DH patients (41.25±10.05, 43±11.93; p=0.66) and same was also seen after 6 months of follow-up evaluation (67.91±14.36, 68.57±17.40; p=0.88).

Conservative treatments for 6 months significantly improved Oswestry Disability Score in study patients (25.82±16.92,53.66±17.66; p=0.00) (Table 2). After initial evaluation, mean of Oswestry Disability Score was significantly higher in DE Patients than DH patients (58.42±18.81, 47.36±14.17; p=0.03) but this difference was not seen after conservative treatment of 6 months (24.91±14.49, 26.85±17.76; p=0.758).

Mean of SLR degree in study patients after 6 months follow-up significantly improved in comparison with initial evaluation (68.22±15.67, 43±11.93; p=0.00). In initial evaluation DE patients had no significant difference in mean of SLR degree as compared to DH patients (41.25±10.05, 43±11.93; p=0.66) and same was also seen after 6 months of follow-up evaluation (67.91±14.36, 68.57±17.40; p=0.88).

Oswestry Disability Score had no significant difference between patients of conservative treatment and type of DH in the initial evaluation. About 135 (30%) female and 315 (70%) male included in the study.

Table 1: Level of DHo in our patients

| Level/type of DH/DE | L3-L4 n (%) | L4-L5 n (%) | L5-S1 n (%) | Total n (%) |
|---------------------|-------------|-------------|-------------|-------------|
| DH                  | 9 (45)      | 126 (63.6)  | 63 (31.8)   | 198 (44)    |
| DE                  | 9 (3.6)     | 126 (50.0)  | 117 (46.4)  | 252 (56)    |
| Total               | 18 (4.0)    | 252 (56.0)  | 180 (40.0)  | 450 (100)   |

DE: Disc extrusion, DH: Disc herniation

Table 2: Change of VAS and ODIS at baseline and after 6 months of treatment

| VAS change | ODIS change |
|------------|-------------|
| Baseline   | (7.1±1.43)  | (5.56±17.66) |
| After 6 months | (3.1±1.84)  | (25.88±6.99) |

VAS: Visual analog scale, ODIS: Oswestry Disability index score

CONCLUSION

According to the results of our study, conservative treatment in patients with acute lumbar DH causes significant pain relief and disability improvement without any notable side effects. Conservative management with proper patient selection can reduce risk of inappropriate surgery in patients with lumbar DH. There is no relationship between clinical outcome at the end of 6 months of conservative treatment and type of DH in the initial evaluation. About 94% of patient with conservative treatment clinical improvement was seen. Oswestry Disability Score can be a good prognostication indicator for future surgery operations.

ACKNOWLEDGMENT

The authors would like to thank the Department of Radiodiagnosis and Imaging, Command Hospital, Lucknow and all the team members who supported while preparing this article.

AUTHORS’ CONTRIBUTIONS

All the cases presented in the current study were clinically evaluated by Ashok Kumar and T Rappai. Ashok Kumar, Neerav Porwal.
Surender, and TJ Rappai made a substantial contribution in conception, acquisition of data, interpretation of data, in drafting the article and revising it for ensuring critical academic content and agreed to be held accountable for all aspects of the work.

CONFLICTS OF INTEREST
The authors declare that there are no conflicts of interest related to this study.

AUTHORS’ FUNDING
The author(s) received no specific funding for this work.

REFERENCES
1. Cherkin DC, Deyo RA, Looser JD, Bush T, Waddell G. An international comparison of back surgery rates. Spine (Phila Pa 1976) 1994;19:1201-6.
2. van Tulder MW, Koes BW, Bouter LM. A cost-of-illness study of back pain in The Netherlands. Pain 1995;62:233-40.
3. Hardy R, Ball P. Treatment of disk disease of the lumbar spine. In: Winn HR, editor. Youmans Neurological Surgery. 5th ed. Philadelphia, PA: Saunders; 2004.
4. Ropper A, Brown R. Pain in the back, Neck and extremities. In: Ropper A, Brown R, editors. Asams and Victor’s Principles of Neurology. New York: McGraw Hill; 2005.
5. McCormick P. Intervertebral discs and radiculopathy. In: Rowland L, Lippincott W, editors. Merritt’s Neurology. New York: Neurological Institute; 2005.
6. Welch WC, Gerszten PC. Alternative strategies for lumbar discectomy: Intradiscal electrothermy and nucleoplasty. Neurosurg Focus 2002;13:E7.
7. Rozen D, Grass G. Interventional pain medicine approaches to nonradicular low back pain of internal disc disruption origin. Pain Physician 2005;8:399-409.
8. Pengel LH, Herbert RD, Maher CG, Refshauge KM. Acute low back pain: Systematic review of its prognosis. BMJ 2003;327:323.
9. Saal JA. Natural history and nonoperative treatment of lumbar disc herniation. Spine (Phila Pa 1976) 1996;21:2S-9.
10. Rivest C, Katz JN, Ferrante FM, Jamison RN. Effects of epidural steroid injection on pain due to lumbar spinal stenosis or herniated disks: A prospective study. Arthritis Care Res 1998;11:291-7.
11. Wang JC, Lin E, Brodke DS, Yousef JA. Epidural injections for the treatment of symptomatic lumbar herniated discs. J Spinal Disord Tech 2002;15:269-72.
12. Peul WC, van Houwelingen HC, van den Hout WB, Brand R, Eekhof JA, Tans JT, et al. Surgery versus prolonged conservative treatment for sciatica. N Engl J Med 2007;356:2245-56.
13. Ahn SH, Park HW, Byun WM, Ahn MW, Bae JH, et al. Comparison of clinical outcomes and natural morphologic changes between sequestered and large central extruded disc herniations. Yonsei Med J 2002;43:283-90.
14. Owlia MB, Salimzadeh A, Alishiri G, Haghghi H. Comparison of two doses of corticosteroid in epidural steroid injection for lumbar radicular pain. Singapore Med J 2007;48:241-5.
15. Pearson AM, Blood EA, Frymoyer JW, Herkowitz H, Abdu WA, Woodward R, et al. SPORT lumbar intervertebral disk herniation and back pain: Does treatment, location, or morphology matter? Spine (Phila Pa 1976) 2008;33:428-35.
16. Weinstein JN, Lurie JD, Tosteson TD, Skinner JS, Hanscom B, Tosteson AN, et al. Surgical vs nonoperative treatment for lumbar disc herniation: The spine patient outcomes research trial (SPORT) observational cohort. JAMA 2006;296:2451-9.
17. Masui T, Yukawa Y, Nakamura S, Kajino G, Matsubara Y, Kato F, et al. Natural history of patients with lumbar disc herniation observed by magnetic resonance imaging for minimum 7 years. J Spinal Disord Tech 2005;18:121-6.