ORIGINAL ARICLE

Comparison of outcomes of Caudal Epidural Injection, Physical Therapy alone and combination of both in treating Low back pain due to Prolapsed Intervertebral Disc

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ABSTRACT

Background: The study is based on conservative management of low back pain in prolapsed intervertebral disc (PIVD)patients to whom surgery was advised but they refused to surgery. To increase the awareness about the conservative management of PIVD and its outcomes we compare caudal epidural injection, physical therapy alone and combination of both. This study helpful for those who want to go with conservative management with better understanding of treatment strategies.
Aim: To compare the effectiveness of caudal epidural injection, physiotherapy and combination of both in treating low back pain due to PIVD among patients who refused to surgical interventions.
Methodology: A Quasi experimental study conducted among PIVD patients who refused to surgery from orthopedic, neurosurgeons or spine surgeons of Lahore by convenient sampling method. Duration of data collection was 6 months A sample size of 50 patient was selected. The back pain Functional Scale questionnaire is used to measure 12 kind of activities of daily living and will rate in 5 categories. McGill pain questionnaire was used to measures the pain in mild, moderate and severe category .Patients were equally divided in groups A, B and C physiotherapy alone , steroid injection and combination of both respectively. Before treatment patients activity of daily livings (ADLs) and pain score was measured by BPFS and McGill score.
Results: The improvement in the physiotherapy group was 13.93±4.74, in epidural group was 15.4±4.91, and in combination group was 21.8±5.72. The improvement in functional score in the physiotherapy group was 26.87±15.06 in epidural group was 27.13±8.63, and in combination group was 32.67±8.79,P value calculated by ANOVA test (0.001) show that there is significant difference in the improvement level among all three groups.
Conclusion: Although all there three treatments were effective in improving low back pain and function but the most effective treatment was combination of physiotherapy and epidural injection. Key Words: Prolapsed intervertebral disc, low back pain, radiculopathy, activity of daily livings.
Keywords: Caudal epidural injection, physical therapy, low back pain

INTRODUCTION

Disc herniation is very common in lumbar spine. The spine consist of 33 vertebrae, divided in 5 parts, in convex and concave curves. Lumbar spine consist of 5 vertebras, L1 and L2vertebrae transition towards the thoracic region and L4 and L5vertebrae transition towards the sacrum region[1]. Lumber disc herniation is a common reason for patients to visit a physician or a consultant [2]. Basically, lumber disc herniation is expulsion of disc material from the disc. It's highest prevalence among people aged 30 to 50. Males to female ration is 2;1. [3] A herniated disc is a displacement of material (nucleuspulposes and annulus fibrosis). It begins by rupture in the inner most ring of the dics that leads to prolapse of nucleus pulposes that causes impingement of either on center or lateral sides. Lateral disc herniation is more common and likely to cause severe radiating pain in the leg i.e. radiculopathy and more sensory dysesthesia as compared to the central disc herniation[5]. The major sufferer is not only the patient himself or herself but family too. The problems faced by the patient are difficulty in performing activities of daily living, So Symptoms of the PIVD are pain in low back, radiculopathy, and affected ADLs. And the investigations usually done to find whether it is nerve impingement or pain due to any other related deformity or origin especially renal colic. [6] Patients face not only the fear of disability and change in their lifestyle but there is also a hesitation in selecting treatment options especially among those who are recommended surgery for it. Psychological factors are also there which effect the health, wellness and well-being of patients who are undergoing surgical treatment of disc herniation[7]. Lumber radiculopathy is that in which pain radiates from the lower back starting from spin to the thigh or in the leg . It usually involves nerve roots from LI to SI and is caused by compression of nerve root when it exits the spinal cord from that particular vertebrae with herniated disc that leads to radiculopathy[2]. As there are multiple ways of managing the low back pain due to PIVD i.e., Conservatively or surgically. In case of Conservative management there are many methods. The conservative managements are really effectively needs the good compliance of the patient and proper counseling about the way of treatment. We selected patients who refused to surgery for their PIVD. This experimental study is to conclude the comparison and effectiveness of conservation treatment. Non-surgical ways of treatment for PIVD patient

are; Education/ Counselling, Physiotherapy , Caudal Epidural steroidal injection, anti-inflammatory drugs, home exercise instruction[8], Manipulation, mobilization by physical therapist[9] direct epidural steroid which is injected at herniated disc level under image intensifier[10].

The objective was to determine and compare the effectiveness of physiotherapy, steroid, injections and combination of both in PIVD patients who refused to surgical treatment.

Hypothesis: There is no significant difference between all the three treatment in improving pain and ADLs.

Alternate hypothesis: Combination of physiotherapy and steroid is more effective than other two treatment options in improving pain and ADLs in PIVD patients.

MATERIALS AND METHODS

A Quasi experimental study conducted Patients of prolapsed inter vertebral disc who refused to surgical intervention. Chaudhry Muhammad Akram Teaching and Research Hospital Raiwind Road Lahore. Duration of data collection was 2 years, A sample size of 50 patients were selected. The eligibility criteria kept in consideration during data collection by convenient sampling method. Adult patients of Age B/W18-55years old of both genders were included in the study. Patients with traumatic spinal cord injuries, Caudaequina syndrome, Renal colic excluded from study. Surgery was advised by orthopedic / neurosurgeon on the basis of clinical and radiological findings.

The back Functional Scale questionnaire was used to measure 12 kind of activates of daily living and rate in 5 categories. The 2nd tool was McGill pain questionnaire that measured the pain In mild moderate and severe category. This is a valid questionnaire . While collecting data rule of ethics was kept in consideration. Patients were equally divided in three groups A B C for the treatment of physiotherapy alone, Steroid injection alone and combination of both respectively. Before treatment patients ADLs and pain score were measured by BPFS and McGill scale. Intervention was applied according to given protocols. After treatment of 6 week ADLs and pain score measured again by BPFS and MC Gill scale respectively to determine which treatment is more effective.

Treatment given to three groups as follow, Group A: Physiotherapy protocols physiotherapy with Sonic; s' and soft tissue mobilization consist of 10 sessions over 6 weeks . Groups B; steroid injection (depomedrol) 1 cc (80 mg) and lidocaine1% single blinded study, and the outcome is measured after6 weeks, used in one study[17]. Group C; combination of both {combination of caudal epidural steroid injections and physiotherapy both were given to this group of patients and after 12 month outcome will be measured[18].

The tool used in this study is Questionnaire and used both with its best specificity and reliability. One of them is" Back pain functional scale". This tool is used to measure activities of daily living in patients before the treatment and after 6 week of treatment to check outcome. Consist of 12 questions; respond in 0 to 5 numbers. Total score; 60 Interpretated as Maximum score of 60 and Minimum score as zero. Reliability explained as ICC; 0.88{95% CI; 0.77, 0.94} ICC 0.82. Second tool used is ''McGill pain questions''. This tool is also used to measure pain in 3 categories, before the treatment and outcome of treatment after 6 weeks. Interpolated as total score; 45 .zero-None, 3-Severe Reliability:0.73 to 0.89

Statistical procedure was done by SPSS vr 20. P value was calculated by applying one way ANOVA test {^ 0. 001} that showed the significant difference in the improvement level among three groups.

RESULTS

A total of 45 patients with PiVD participated in the study and they were divided in to 3 Groups {15 participants in each group} . Each group was given different treatment I-e-physiotherapy ,caudal epidural injection, and combination approach. In physiotherapy group 5 {33.3%} were males and 10 {66.7%} were females. In epidural group 9 {60%} were males and {40%} were females , In combination group 8 {53.3%} were males and 7 {46.7%} were females. The mean age of the participant in physiotherapy group was 43.6 +/_ 16.56, in epidural group was 33+_5. 67, and in combination group was 36.73+-12.49.

In Physiography Group ,the mean score of pain before treatment was 25.2+-5.8 and after treatment was 11.27_+5.55 and mean score functional scale before treatment was 20.13+-12.51. and after 47+/-7.12 so there was significance difference in before and after treatment. That showed effectiveness of physiotherapy alone in reducing pain and improving Function.

In caudal epidural group , the mean score of pain before treatment was 25.2+_5.8 and after treatment was 9.8+-5.19 and mean functional scale score before treatment was 22.6+-9.12 and after treatment was 49.73+_8.53. P value calculated through paired sample t test { 0. 001} showed that there is significant difference in before and after reading and treatment is effective in reducing pain and improving function.

In combination group , the mean score of pain before treatment was 31.73.+-3.92 and after treatment was 9.93+-3.59 and mean functional scale score before treatment was 17.47+-8.42 and after treatment was 50.13+_3.56 . P value calculated through paired sample t test {0.001} showed that there was significant difference in before and after this combination treatment and effective in reducing pain and improving function.

The improvement in pain score in the physiotherapy group was 13.93±-4.74 in caudal epidural group was 15.4±4.91 and in combination group was 21.8±5.72. The improvement in functional score in the physiotherapy group was 26.87±15.06, in caudal epidural group was 27.13±8.63 and in combination group was 32.67±8.79. P value calculated through by applying one way AVOVA test {0.001} showed that there was significant difference in the improvement level among combination group.

Table 1: Socio demographic Comparison

Variables		Physiotherapy n=15	Epidural n=15	Combination n=15	Total n=45
Gender	Male	5(33.3%)	9(60%)	8(53.3)	22(48.9%)
	Female	10(66.7%)	6(40%)	7(46.7%)	23(51.1%)
Age		43.6±16.56	33±5.67	36.73±12.49	37.78±12.92
Marital Status	married	12(80%)	7(46.7%)	11(73.3%)	30(66.7%)
	Single	3(20%)	8(53.3%)	4(26.7%)	15(33.3%)
Pain Level	Moderate	6(40%)	3(20%)	4(26.7%)	13(28.9%)
	severe	9(60%)	12(80%)	11(73.3%)	32(71.1%)

Table: 2 Group comparisons (Physiotherapy Group)

Variable	Before Treatment Mean±D	After treatment Mean±SD	P-value
Mc Gill painScore	25.2±5.8	11.27±5.55	<0.001
Beck pain functional scale Score	20.13±12.51	47±7.12	<0.001

Table 3.Caudal Epidural Group.

Variable	Before Treatment Mean±D	After treatment Mean±SD	P-value
Mc Gill painScore	25.2±5.8	11.27±5.55	<0.001
Beck pain functional scale Score	20.13±12.51	47±7.12	<0.001

Table 4 (Combination Group)

Variable	Before Treatment Mean±D	After treatment Mean±SD	P-value
Mc Gill painScore	31.73±3.92	9.93±3.59	<0.001
Beck pain functional scale Score	17.47±8.42	50.13±3.56	<0.001

Table: 5 Comparison of improvement

Variable	Physiotherapy	Epidural	Combination	P-value
Mc Gill painScore	13.93±4.74	15.4±4.91	21.8±5.72	<0.001
Beck pain functional scale Score	26.89±15.06	27.13±8.63	32.67±8.79	<0.001

DISCUSSION

Literature support different kind of conservative management treatment protocols. This study focused on Effectiveness of conservative management in patients of PIVD based on the treatment groups in study physiotherapy, Steroids injection and combination of both. Each comprised 15 number of patients, total 45 patients, First group was given physiotherapy treatment for 6 weeks, The mean age of participants in physiotherapy group was 43+_16. 40% patients were with moderate pain and 60% patients were with severe pain before the treatment initiated. A study conducted in 2008 by Zelhaunhu et al. In which they used three modalities of physiotherapy in patients of disc herniation. By using ultrasound, low power laser, and traction on 60 patients there was marked reduction in disability, pain and size of herniation of mass on magnetic resonance imaging. The study conclude that all the 3 modalilties were surprisingly effective in treatment of acute lumbar disc herniation {Unlu,2008#60}. But this study gave the results which showed improvement in pain score in the physiotherapy group was 13.93+-4.74. The improvement in functional score in the physiotherapy group was 26.87+_15.06. Second group was given epidural steroid injection. In epidural 9 {60%} were males and 6 {40%} were females Patients complaint of severe pain and 20% came with moderate pain before the treatment. Another prospective case study in November 1998, conducted by Gregory E.Lutz et al. To evaluate the effectiveness of transforaminal epidural steroid in patient of disc herniation with radiating leg pain. Patient activity level and satisfaction level before and after epidural was measured. 69 patient were taken for this treatment and after follow up of 80 weeks. There was satisfactory long term outcome. So it was proved an effective long term non-surgical procedure in disc herniation [2], But in my study which is conducted in Lahore, Pakistan In epidural Group the mean score of pain before treatment was 25.2_+5.8 and after treatment was 9.8+-5.19 and mean score functional scale before treatment was 22.6+-9.12 and after treatment was 49,73+-8.53. This shows epidural. steroid injections are also effective treatment for PIVD patients. The third group is given both treatment in combination. In combination group , the mean score of pain before treatment was 31.73 +-3.921 and after treatment was 99.3+_5.9 and mean score functional scale before treatment was 17,47+-8.42 and after treatment was 450.13+-3.56 9.73+_8.53.P value calculated through paired sample t test {0.001} show that there is significant difference in before and after reading and treatment is effective in reducing pain and improving function. The improvement in pain score in the physiotherapy group was 13.93+-4,74 in epidural group was 15. 4+-4,91, which was less as compare to combination group {21.8+-5.72} .The improvement in functional score in the physiotherapy group was 26.87+-15.06. in epidural group was 27.13+-8.63 and results were excellent for combination group was 32.67+_8.79. It showed significant difference in improvement level among all the three group. Combination of physiotherapy and steroid injection in the same period of time I.e;6weeks remains best in term of pain and functional disability for the patients of PIVD.

CONCLUSION

Al through all three conservative treatment approaches were effective in improving pain and function in low back pain due to PIVD but the most effective approach is combination approach of physiotherapy and caudal epidural injection.
Limitation: In this experimental study Sample size was small
Male and female were not equally divided.
Single center study

RECOMMENDATION

- Better methodology with random sampling.
- Study should be conducted on large scale and multicentered

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