



Effectiveness of an educational intervention on pain duration and severity of herniated disc

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Original Article

Abstract

BACKGROUND: One of the causes of low back pain is herniated disc that puts pressure on the nerve roots and cause pain radiating down the legs. Specific body movements tend to aggravate pain. Among treatment approaches, patient education could be considered as an effective way of pain management. We did not find any study showing the effects of educational intervention on pain management in searched medical literature. This study aimed to investigate effects of educational intervention on the level of pain due to herniated disc.

METHODS: In this study, 83 patients with lumbar disc pain were selected and pain intensity and duration were recorded based on a scale from one to ten. The average pain intensity and duration before and after intervention were recorded. Then the data were analyzed using SPSS software.

RESULTS: Frequency of L4-L5 herniated disc was 39.7%, L5-S1 was 36.1% and L4-S1 was 24.1%. Mean intensity of pain before intervention was 8.33. After intervention, duration of pain decreased from 8.34 ± 0.73 to 6.76 ± 5.54 ($P < 0.001$) and mean duration of pain before and after intervention were 65.6 ± 5.21 and 53.5 ± 5.83 minutes, respectively ($P < 0.001$).

CONCLUSION: Educational intervention for patient with lumbar herniated disc could be used as a practical complementary method beside other therapeutic approaches in the treatment of low back pain.

KEYWORDS: Educational Intervention, Pain, Herniated Disk, Low Back Pain

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Introduction

Low back pain is a common and costly medical conditions.^{1,2} In 75% of the patients, their condition is improved by treatment but in 25% it deteriorates despite treatment.^{3,4} One of the causes of low back pain is bulging or herniated disc which causes pressure on the nerve roots and radiation of pain to lower limbs.⁵ Dislocation of back vertebra mostly occurs in L4-L5 and L5-S1 and its diagnosis is achieved by straight leg raise test (SLRT), magnetic resonance imaging (MRI) and CT-scan.⁶ Some activities

may cause increased intraspinal pressure (bending down, getting up fast from a lying position, sneezing and coughing) which may cause increased pain. This may cause aggravation of pain and changes in the spinal cord mechanics and ultimately body forms.⁶ Low back pain may cause limitation in movement and weakness in hip muscles.⁵ The most common reason for limitation of movement in patient under the age of 45 is low back pain which occurs mostly with increasing age.⁷

Relationship between some background conditions and low back pain as well as long period of standing, sitting and heavy works has been confirmed. Other psychological reasons like

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routine and monotonous jobs, low levels of job satisfaction, and stressful jobs has been mentioned as related to low back pain.^{8,9} Statistics have shown that from 32711 patients referred to health clinics, 7935 cases had chronic low back pain.¹⁰ Side effects of chronic low back pain include depression, loss of job, and sleep disorder.¹¹ Treatments are surgical and therapeutic including non-steroidal and corticosteroid medications.⁶

Obviously exclusive therapeutic or surgical intervention may not be successful in treating these patients; furthermore, surgery has its own side effects. It seems that rehabilitation treatments like physiotherapy and aerobic exercises as well as walking and swimming are effective on decreasing duration and severity of pain.⁵ A study done by Selkowitz *et al.* showed that one hour patient education in a session could affect on level of awareness in patients under micro discectomy surgery.¹² Sherman *et al.* study showed that combination of Yoga and physical exercise in addition to self-care education improves function and decrease chronic low back pain.¹³ Another study done by Deyo *et al.* showed that patient education caused job satisfaction and decreased job absenteeism with a rate of 80%.¹⁴ Another study by Schectman *et al.* showed that patient education in low back pain caused behavioral change leading to decrease in pain.¹⁵ Patient education is one of the responsibilities of health care team. With regard to the conducted studies, no exclusive study has been done to evaluate the effect of patient education on the level of pain due to herniated disc. Considering low cost and limited side effects as well as ease of implementation, this study was conducted to evaluate the effect of education on herniated disc pain.

Materials and Methods

The study was a before after clinical trial. The subjects were patient with low back pain referring to the Besat Clinic in Kurdistan University of Medical Sciences, Iran. Non-probability sampling method was used during

which patient did not have equal chance for entering into the study and only patients were chosen who had pain due to herniated disc. Sample size was determined based on Cochran's formula at $\alpha = 0.05$ with power of 80%, resulting in a total of 83 patients. Data gathered using: 1) Demographic questionnaire, 2) numeric pain scale (0-10) for pain assessment before and after the intervention, and 3) table for pain duration in minutes before and after the intervention. Considering the validity and reliability of the instruments, the numeric measurement tool for pain has been used in many countries and its reliability has been approved. Test-retest reliability of the survey instruments was assessed using 10 patients of sample population in a period of one week by Pearson's correlation coefficient ($r = 96\%$) showing good reliability of the instrument.

The research team attended the location and after examining the venue and subjects, based on demographic data and other factors started to choose subjects according to inclusion criteria: 1) One month pain duration, 2) pain should be due to herniated disc, 3) no lumbar canal stenosis or other conditions, 4) being literate, and 5) using the same medication during the study. Exclusion criteria were: 1) Failure to follow instructions, 2) changes in medication, 3) having other diseases related to the spinal cord, and 4) not willing to participate in the prospective study.

Informed consent was obtained from the patients knowing that they could be excluded from the study upon their request. The patients were informed that they could use their prescribed medication including naproxen 500 mg twice daily, Depomedrol injection (prednisolone) 40 mg and Kopex topical gel twice daily after the intervention. During the course of the study, the subjects were examined by neurosurgeons using MRI and SLRT test to diagnose the herniated disc. Before intervention, information regarding pain intensity and duration were collected (83 patients).

Practical patient education was given to the subjects in the physician clinic and after that

hand out were distributed among them. A sample of patients education instructions is: Refraining from exercises which induce intracranial pressure like bending down and tensions due to coughing and sneezing; resting on a firm floor; proper weight lifting technique; semi-sitting position lead to back muscle relaxation; patients should place a pillow between their knees while they are in a lateral position; in the time of getting up from the lying position the patients should first rest on his/her side and get up while he/she puts pressure on the bed; using wet and hot compress help relaxation of the tense muscles in the back region; walking in the water pool and refraining from hyperactivity due to its negative effect on adjacent muscles in the vertebral column; and hanging from a horizontal bar several times a day. In case these managements did not reduce the pain, patients should refer to the physician for further follow-up. Then the duration and intensity of pain chart was distributed among patients to be filled out at home and they were reminded to deliver them in their next clinic referral. The patients learned to fill out intensity and duration of pain chart and were informed that in case they were unable to fill out the form they would be excluded from the study. Finally, data were recorded and analyzed using SPSS (version 19; SPSS Inc., Chicago, IL., USA). For comparing duration and intensity of pain before and after intervention, paired t-test was conducted with regard to the normal distribution of both variables.

Results

Mean age of the subjects was 37.5 years with a range between 18-65 years, 51 (61.4%) patients

were male, and 55 (66.3%) patients were married. The results showed that bending of the leg caused aggravation of the pain in all of the patients. The SLRT test was positive in 75 (90%) patients. In 33 (39.7%) patients in L4-L5, in 30 (36.1%) patients in L5-S1, and in 20 (24.1%) patients both had disc herniation. 71 (85%) patients had pain in the time of getting up from bed. Pain increased in 73 (88%) patients with activity and in 61 (73%) subjects with sneezing or coughing. 68 (80.7%) patients had gait disorder. 73 (84%) patients had foot paresthesia. 29 (34%) subjects were obese. The results are shown in table 1.

Discussion

The results revealed that mean intensity of pain before and after intervention were (8.33 and 6.76) respectively; along with mean duration of pain before intervention was 65.6 minutes that was reduced to 53.5 minutes after intervention. The results showed that patients with improper physical activities had more pain. Another factor in our study was obesity which involved 29 patients with herniated disc. Risk factors included low back pain, lifting of heavy objects, torsion of the waist, and continuous and severe body movement, and obesity. Most of the herniated discs were in L4-L5 and L5-S1.⁶ In our study, most of the cases had L4-L5 disc herniation (39.7%); however, disc herniation in L5-S1 (36.1%) had the most frequency. In patients with herniated disc in L4-S1 which involved all 3 vertebrae, the rate was 24.1%. The results showed that mostly one of the vertebrae was involved and when both of the vertebrae were involved, patients had more pain which could be considered as an important finding.

Table 1. Mean intensity and duration of pain due to disc herniation in patients with lumbar disc herniation

| | | Mean \pm SD | Mean difference (95% CI) | t | P |
|-------------------------|--------|-----------------|--------------------------|------|---------|
| Pain intensity | Before | 8.34 \pm 0.73 | 1.41 (1.24-1.57) | 17.3 | < 0.001 |
| | After | 6.76 \pm 5.54 | | | |
| Pain duration (minutes) | Before | 65.6 \pm 5.21 | 12.1 (11.2-12.9) | 21.3 | < 0.001 |
| | After | 53.5 \pm 5.83 | | | |

CI: Confidence interval; SD; Standard deviation

The results of the study showed that mean intensity and duration of pain before intervention were decreased after intervention. In comparison with other studies, the study done by Selkowitz et al. revealed that one hour patient education in one session in cases undergoing microdiscectomy causes increased awareness resulting in decreased pain.¹²

However, in our study, patient education three times a week (each time half an hour) was conducted during which educational pamphlet was distributed among the patients. In another study, 101 patients with chronic back pain were chosen for a 12 weeks yoga training course. For waist function, 24 digits Ronald scale and 11 digit pain intensity scales were used. Results showed that yoga was more effective than educational booklet on patients and in decreasing their chronic back pain.¹³ Concerning pain management in patients with disc hernia, we used only one method but they used two therapeutic methods. We recommend that in future studies, effect of yoga on decreasing pain due to disc hernia should be considered. Another study showed that patient education caused patient satisfaction leading to 80% reduction in absenteeism.¹⁴

In our study practical patient education and proper body movement like getting up from bed side and lying down as well as controlling sneezing and coughing caused less pain and more satisfaction in second and third sessions. Schectman et al. showed that education causes change in behavior and reduced pain in the patients suffering from acute low back pain,¹⁵ which is congruent with our study.

Another study by Cherkin et al. showed that in patients with low back pain both exercise and manual therapy on the spine had better results compared with educational booklet; however, the latter were more cost effective.¹⁶ With regard to lower cost of patient education in our study, patients were more willing to benefit from it. In a study entitled "patient education, the base for neurophysiologic low back pain", intervention was given to the patient for a 4 weeks period and

the patients were divided into two groups. One group received physiotherapy and the other only received education. In line with our study, no significant difference was observed between the two groups.¹⁷ Another study by Saicheua et al. entitled "documents and findings in physical and cognitive alteration among patients with low back pain after patient education" showed that teaching physical activity has a great influence on pain relief resulting in improving physical function¹⁸ which is congruent with our findings.

A study done by Bharpayma named "comparison of the effects of medical education method on decreasing functional instability of lumbar spine", showed that before the exercise there was no significant difference between two groups according to functional instability of lumbar vertebra. Before this exercises, there was also no significant difference between two groups based on functional instability of lumbar spine. Patients in both groups after the exercises showed significant improvement in symptoms of functional instability of lumbar spine. In addition, there was no significant difference after the workouts in patients. The results showed that both methods could decrease pain and other signs and both methods have similar effect on clinical manifestation of functional instability in lumbar spine.¹⁹

With flexion of the foot and physical activity in these patients, pain severity increases. Even coughing and sneezing increase the pain. Brunner et al. believed some activities increase intra cranial pressure (like bending, getting up from a lying position, tensions due to sneeze, and coughing) which in turn increases the level of pain. This pain causes vertebral and postural deformity in body which was in line with our study.⁶ The results showed that after disc herniation, patients had paresthesia resulting in movement disorders due to changes in natural body mechanics because of pain. Sometimes we may face deformities in body posture and movements. Other signs and symptoms involved muscle atony, changes in tendon reflexes, and loss of sensation. Other

accompanying signs and symptoms include loss of muscle tone, alteration in tendon reflex and parasthesia.²⁰ The result of our study confirms this finding.

Risk factors include low back pain, lifting of heavy objects, torsion of the waist, and continuous and severe body movement and obesity. However, we may find patients suffering from low back pain without aforementioned risk factors.^{21,22} In a study in 2001 in Thailand, 78.4% of patients had disc herniation in the vertebral column, most of them were 26 to 35 years of age. Most risk factors in these patients had a history of prolonged heavy weight lifting.²³ This is analogous to our study in which most of the patients with low back pain were male candidates.

With regard to the above mentioned studies, patient education could be considered as a pain management approach and in case of combining with other therapeutic methods could even be more effective; hence our patients used medication in the time of intervention. In order to decrease the amount of error, each patient was considered as its own control and every patient used the same medication during the intervention period.

Conflict of Interests

Authors have no conflict of interests.

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