THE INVESTIGATION OF FACTORS AFFECTED THE QUALITY OF LIFE IN PATIENTS WITH CHRONIC LOW BACK PAIN

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Objective: The study was designed to assess balance, walking, physical performance and quality of life in lumbar disc herniation (LDH) patients with chronic low back pain.

Material And Methods: The study included 63 cases, 32 of whom were diagnosed with LDH and 31 of whom were healthy controls. The time-up and go test was used to compare the physical performance, the Tinetti balance and gait test was used to compare balance and gait functions and the SF-36 index was used to compare the quality of life of the patients.

Results: Although the healthy group was only expected to complete the time-up and go test earlier than the case group ($p<0.05$), their Tinetti balance test parameters were also found to be better ($p<0.05$). When the SF-36 Quality of Life Scale sub-parameters of the case and healthy control groups were compared, significant differences were determined in all parameters except for mental health ($p<0.05$).

Conclusion: In LDH patients with chronic low back pain, increases in pain and decreases in balance, walking, and physical performances affect activities of daily living and quality of life negatively. Therefore, when physiotherapy programs are planned, the evaluation of functional status and quality of life parameters are of importance.

Key Words: Chronic low back pain, Lumbar Disc Herniation, SF-36 quality of life scale, functional status

INTRODUCTION

Lumbar disc herniation (LDH) is the most common cause of acute, chronic or recurrent low back pain and usually occurs as a result of stresses during flexion (Waxman et al., 2000).

Three to ten percent of chronic low back pain, which takes the first place among musculoskeletal complaints, develop due to disc herniation and cause serious economic losses in industrialized countries. In several studies, it has been reported that 80% of people have had complaints of low back pain at some time in their lives (Burdorf, 1995; Buritten, 1983). Due to its high prevalence in society and post-operative complications, LDH leads to significant reductions in physical performance and quality of life (Narin et al., 2008). LDH, one of the complications of low back pain, is among the most important health problems which cause permanent functional losses or labor-force losses (Demoulin et al., 2007; Kim et al., 2010).

Due to chronic low back pain, individuals experience deficiencies in their working ability and daily living activities such as walking, standing, sitting, weight lifting and carrying things (Demoulin et al., 2007; Rabini et al., 2007). Reduction in muscular strength, endurance and sense of proprioception resulting from chronic low back pain negatively affect body mechanics of LDH patients, and these patients suffer balance disorders due to postural changes (Coşkun & Can, 2012). Maintenance of postural balance under static or dynamic conditions is essential for any functional activity. In individuals with chronic low back pain, the degree of control may change such that performing daily tasks becomes compromised and the chronic nature of the disease is sustained. The mechanisms that lead to such abnormalities of postural control remain unclear. Pain is an important factor in mechanical and neural alterations, but the extent to which it influences postural balance still cannot be determined (Brech et al., 2012; Della et al., 2006).

In the evaluation of patients with low back pain, it is important to determine their history and physical characteristics. It is also important to perform functional evaluation specific to the disease. Reduction in the physical and work capacity of people with low back pain causes difficulties in their activities of daily living (ADL). As a result, quality of life parameters such as physical health, mental health, level of independence and social relationships are adversely affected (Resnik & Dobrykowski, 2005; Wood & Douphine, 2001).

Evaluation of physical properties, functional status and quality of life of LDH patients is important when treatment objectives are determined and the treatment is planned. Therefore, the study was planned to assess physical performance, balance, walking and quality of life parameters in patients with LDH.

MATERIALS AND METHODS

The study included 63 cases whose records were retrospectively scanned. Of the cases, 32 were patients (26 females, 6 males, with a mean age of 59.5 ± 4.8, ranging from 51 to 70) who presented with complaints of chronic low back pain which lasted more than three months and radiologically diagnosed to have LDH, and 31 were healthy individuals (25 females, 6 males, with a mean age of 58.3 ± 3.9, ranging from 52 to 66). Those cases with a primary or metastatic tumor, infection, spinal fracture, inflammatory low back pain (rheumatoid arthritis, spondyloarthropathy), urinary tract symptoms, or severe loss of muscle strength and sensation in the lower extremity or having undergone previous surgery were excluded from the study.

Pain assessment:

The patients' low back pain level at rest and during activity was evaluated with the visual analogue scale (VAS), one of the most frequently used methods in the literature. Quantitative assessment was determined to range from 0 to 10. (0: no pain, 10: maximum pain.) Patients were asked to express their pain in points (Hayden et al., 2005).

Functional evaluation:

The time-up and go (TUG) test was used to assess the cases' physical performance. The patients were asked to rise from a chair, walk three meters, turn around, walk back to the chair at a normal walking pace, and sit down.The test period was recorded with a stopwatch (Dai et al., 2012).

Tinetti Balance and Gait test was used for the evaluation of balance and gait. There are 13 parts in Tinetti balance assessment: sitting balance, rising from a chair, immediate standing balance, the first long-term standing balance, standing balance with eyes closed, turning balance, response to the push on the sternum with the elbow, neck rotation, 5 second-balance on one leg, back extension, reaching up, bending down, sitting down (1 point: normal response, 2 points: adaptive response, 3 points: abnormal response). Tinetti Gait Assessment is composed of nine parts: initiation of gait, step length, step height, step symmetry, step continuity, gait deviation, trunk stability, walking stance, and turning while walking (1 point: normal response, 2 points: abnormal response) (Padala et al.,2012).

Evaluation of Quality of Life :

In order to assess the quality of life of the cases, the SF-36 Quality of Life Scale was used. The SF-36 Quality of Life Scale which provides a wider-range measurement of quality of life than do other scales was developed in 1992 by the Rand Corporation and has been used since then. It consists of 36 items, and measures 8 dimensions: physical function, role limitations (physical), pain, general health, vitality (energy), social function, role limitations (emotional), and mental health (Resnik & Dobrykowski, 2005; Wood & Douphine, 2001).

Statistical Analysis:

For the statistical analysis of the data, the t-test was used in independent samples. The data were evaluated with the SPSS (Statistical Package for Social Sciences for Windows, version 16.0) package program. "$p < 0.05$" was used to indicate the level of significance.

RESULT

The patient and control groups were similar in terms of their demographic characteristics (Table 1). The patient group's pain scores at rest and activity according to VAS are shown in table 2. (Table 2).

Table 1: Demographic Characteristics

	Patients Group X ±Sd	Healthly Group X ± Sd	p
Age (years)	59.50±4.84	58.35±3.91	0.307
Height (cm)	162.81±6.95	163.51±6.06	0.671
Body weight (kg)	72.93±13.47	71.64±10.12	0.669
Sex (M/F)	26 F, 6M	25 F, 6M	

Values are given as mean and standard error.

Table 2: The patients' pain level at rest and during activity

	Patients Group X ±Sd
Rest Pain	2.78±1.31
Activity Pain	6.18±1.06

Values are given as mean and standard error.

The comparison of both groups according to the TUG test revealed that those in the control group completed the test in a shorter period of time ($p < 0.05$) (Table 3).

Table 3: Comparison of the Time-up and Go Test of patients and healthy group

	Patients Group X ±Sd	Healthly Group X ± Sd	p
Time-up and Go Test (sn)	8.97±1.08	7.31±1.08	0.000*

Values are given as mean and standard error.
* $p < 0.05$

According to Tinetti balance test evaluations of the patient and control groups, while the parameters of the control group were better than those of the patient group ($p < 0.05$), there was no difference between the two groups in terms of Tinetti gait test results ($p > 0.05$) (Table 4).

Table 4: Comparison of the Tinetti Balance and Gait Test of patients and healthy group

	Patients Group X ±Sd	Healthly Group X ± Sd	p
Tinetti Balance Test	19.12±2.48	14.80±3.02	0.000*
Tinetti Gait Test	9.81±1.57	9.48±1.85	0.450

Values are given as mean and standard error. * p < 0.05

The comparison of the sub-parameters of the SF-36 Quality of Life Scale revealed a significant difference between the patient and control groups in terms of their physical function, role limitations (physical), pain, general health, social functioning, role limitations (emotional), and vitality (energy) evaluations (p <0.05). However, the difference between the two groups regarding the evaluation of mental health was not significant (p> 0.05) (Table 5).

Table 5: Comparison of the SF-36 index of patients and healthy group

	Patients Group X ±Sd	Healthly Group X ± Sd	p
Physical function	22.59±4.04	27.77±2.09	0.000*
Role limitation (physical)	4.90±1.20	7.58±1.08	0.000*
Pain	5.68±1.90	9.51±1.31	0.000*
General health	15.37±4.95	22.32±3.08	0.000*
Vitality (energy)	15.71±4.22	18.74±2.74	0.001*
Social function	7.50±1.98	9.03±1.11	0.000*
Role limitation (emotional)	4.12±1.09	5.70±0.90	0.000*
Mental health	21.21±3.03	22.45±2.36	0.078

Values are given as mean and standard error. * p < 0.05

DISCUSSION

In this study, it was determined that physical performance, balance, walking, function and quality of life of LDH patients with chronic low back pain were adversely affected compared to healthy individuals.

Chronic low back pain is one of the most important health problems leading to permanent functional losses and labor-force losses. Although there are many causes of low back pain, it is most often caused by degenerative disc pathologies

(Burdorf, 1995; Buritten, 1983). There are different physical therapy approaches to back pain caused by LDH. Among these treatment approaches are the reduction of pain, development of the sense of proprioception, and improvement of strength, flexibility, and functional status. In LDH, the evaluation of decreased performance in functional movements due to pain is extremely important since it shows the effectiveness of the treatment (Coşkun & Can, 2012; Rainville et al., 2004; Rasmussen-Barr et al., 2003; Vezina & Hubley-Kozey, 2000). One of the activities which increase the pain and symptoms in LDH patients is rising from the sitting position. This activity is one of the important functions that affect the level of independence in the activities of daily living (ADL) (Eriksrud & Bohannon, 2003; Rabini et al., 2007; Unver et al., 2005).

The TUG test, used in clinical practice, assesses activities such as sitting, quick rising from a seat, quick walking, in other words functional mobility, which includes the combination of concentric and eccentric muscle contraction (Podsiadlo & Richardson, 1991; Tunay et al., 2010). From the point of physiotherapy, evaluation of this activity which is easily affected in the presence of orthopedic and neurological diseases is important since it is used to determine the functional deficiencies and the treatment of these deficiencies in patients with LDH (Kocak et al., 2009; Narin et al., 2008; Rabini et al., 2007).

In the literature, the TUG test, used to evaluate patients' functional levels, is an objective test. It is also an important method in planning physiotherapy programs and analyzing the results of the treatment since it is used to evaluate patients' decreased walking performance caused by pain, muscle weakness and decreased muscle endurance (Tunay et al., 2010). In our study, it was determined that patients with LDH needed more time to complete the TUG test. We consider that the reason why LDH patients with chronic low back pain receive worse scores in the TUG test than do healthy subjects is that the former suffer from restrictions in their functional activities due to the increase in pain according to VAS.

Changes in vertebrae and intervertebral disks in people with chronic low back pain cause difficulties when a person keeps his/her upright posture and body mechanics properly. Therefore, increased postural sway in patients with chronic low back pain leads to balance and gait disorders (Conway et al., 2011; Sipko et al., 2010). Hamaoui et al. found that individuals with chronic low back pain showed more postural sway compared to healthy individuals (2004).In a similar study by Yahia et al., it was determined that patients with chronic low back pain showed more anterior-posterior and medial-lateral postural sways in standing straight up position more than did healthy subjects (2011). Brumagne et al. reported that LBP young people have reduced lumbosacral position sense that could be related to altered paraspinal muscle spindle afference or central integration problems (Brumagne et al., 2000).Tomkins et al. determined that low back pain patients' walking performance was worse than that of healthy subjects because of pain (Tomkins-Lane et al., 2012). In our study, in line with the literature, it was determined that balance and walking functions of the LDH patients with chronic low back pain were worse than those of healthy subjects according to Tinetti balance and gait test. In this respect, evaluation of balance

and gait function in LDH patients with chronic low back pain and taking this evaluation into consideration when their treatment programs are planned and addition of this treatment into physiotherapy programs will help patients to become more independent in their functional activities of daily living.

The SF-36 Quality of Life Scale is a questionnaire used to assess quality of life in chronic low back pain. The SF-36 is the most commonly used scale in the literature which objectively assesses the quality of life (Lang et al., 2003; Resnik & Dobrykowski, 2005; Wood & Douphine, 2001). In their studies, Narin et al. reported that the quality of life of patients with chronic low back pain was significantly affected prior to the physiotherapy program (Narin et al, 2008). Whereas Kosinski et al. determined that all the parameters of the SF-36 Quality of Life Questionnaire were lower in patients with chronic low back pain than in healthy subjects (2005), Veresciagina et al. found that preoperative low back pain patients had lower quality of life scores compared to healthy subjects (Veresciagina et al., 2007). In our study, in line with the literature, it was determined that the quality of life of the patients with chronic low back pain was significantly affected. The comparison of the parameters of the SF-36 Quality of Life Scale in patients and healthy subjects revealed that the former group had lower physical function, role limitation (physical), pain, general health, vitality (energy), social function, role limitation (emotional) scores.

CONCLUSION

In conclusion, in our study, declines were determined in the functional parameters (i.e. balance and gait) of the health-related quality of life of the patients with chronic low back pain. The increase in pain in LDH patients with chronic low back pain causes decreases in their balance, gait and functional parameters, which in turn adversely affects their activities of daily living and quality of life. Therefore, evaluation of the functional status and quality of life parameters is of great importance when physiotherapy programs appropriate for the patient are planned.

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