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Evaluation of Conservative therapy in two groups of patients with low back pain associated with iliolumbar ligament enthesopathy and injury of muscles around hip in comparison with patients with other causes of low back pain

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Abstract

Background and objective: The most common problem in patients referred to orthopedic clinics is low back pain. Iliolumbar ligament enthesopathy is one of the causes of low back pain. In this study, we investigated the results of conservative therapy in two groups of patients with low back pain.

Materials and methods: This cross-sectional descriptive study was performed on 817 patients with back pain referred to our orthopedics clinic during 2013-2014. After diagnosis, patients were divided into two groups. Group A had pain with short external rotator muscles, iliolumbar ligament enthesopathy and gluteal muscle tenderness, and group B were presented with other causes of low back pain. After the end of the conservative therapy the Oswestry disability index were filled by subjects.

Results and conclusion: Of total, 303 patients (37.1%) were entered the group A and 514 patients (62.9%) were considered as group B with other causes of back pain. Out of 817 patients, 251 were males and 566 were females. The most common cause of pain was found to be discopathy with 438 cases (53.5%). The mean score of the Oswestry pain severity questionnaire was not statistically significant between 2 groups (P = 0.065) prior to the treatment. However, there was found a significant difference between the frequency distribution of the two groups according to the severity of the pain after the treatment (P = 0.0001). In conclusion, the results of our study indicated that the degree of disability, paraclinical cost, diagnosis based on the correct clinical examination in patients could be different, and patients with injuries such as iliolumbar enthesopathy and injured short extensor muscles around the hip and gluteus responded well to conservative therapy.

Keywords: Chronic pain, enthesopathy, low back pain, sprain

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1. Introduction

Low back pain is one of the most common discomforts of patients referring to orthopedic clinics [1], and is the second reason of referring to a doctor after having cold, and it is estimated that about 80% of people have experienced it at least once during their lifetime [2]. It refers to a pain in the lower back, which may be accompanied by reduced movement ability and difficulty in standing up [3]. Lower back pain might happen due to a variety of causes [4] including acute pain following trauma, chronic low back pain, osteomalacia, osteoporosis, lumbar lordosis, scoliosis, spondylolysis, spinal cord stenosis, disk degeneration, herniated disc, tumors, infections, iliolumbar ligament enthesopathy, and piriformis syndrome [5].

Enthesopaties are defined as disruptions of peripheral ligaments or muscle connections. These disorders include anomalies in the region of joints of the tendons and ligaments to the bone [6-8]. Iliolumbar ligament enthesopathy is one of the known causes of low back pain. Functional movements such as lifting or pushing objects, the unbalanced movements and spinal disks rotation, or doing new exercises without being ready can cause back pain. Other causes such as the fractures of the vertebrae, infection or tumor could cause acute lower back pain, however, their prevalence is less and their treatment is considered in other regions. Most of the acute lower back pain cases are relieved in less than a few weeks. Chronic low back pain is described as having the back pain for more than three months. The most important way to treat chronic low back pain is to strengthen the muscles of the waist with the help of special medical exercises, to change the way of lifestyle, learn how to sit, lift, and drive. Generally, conservative approaches are the most common treatment performed for patients with chronic low back pains [9-15]. To the best of our knowledge, there have been still some controversies in the effective treatment of low back pain. Moreover, due to the different etiologies of this highly prevalent disorder, we aimed to investigate the impact of conservative therapy method in patients who suffer from low back pain associated with iliolumbar ligament enthesopathy and injury of muscles around hip in comparison with patients diagnosed with other causes.

2. Materials and methods

2.1. Study design

This descriptive cross-sectional study was performed on patients with lower back pain referred to the orthopedic clinic in Rasht (Iran) during 2013 to 2014. At first, these patients were given a data collection sheet. In the first visit session, low back pain etiology was diagnosed by an eminent orthopedic surgeon based on the patients' history, the physical examination and the early clinical diagnosis of the physician, MRI, EMG-NCV, and spinal column radiography.

2.2. Subjects

Patients were divided into two groups based on the clinical diagnosis. The first group (group A) included patients suffering from lower back pain due to the injury of gluteal muscles, external short rotator muscles, and iliolumbar ligament enthesopathy. The diagnostic criteria were as follows: tenderness on posterior iliac spine and gluteal and positive hip flexion test [11-13]. The second group (group B) included patients with other causes of low back pain. These patients did not show any abnormality on imaging or specific causes of low back pain. Of note, patients with a history of trauma were excluded. After an explanation of the aim of the study, an informed consent to participate was given by subjects. Then, after the end of the course of conservative therapy (including a one-month course of oral administration of naproxen (Zahravi Pharm .Co. of Iran), 500 mg every 12 hours, topical piroxicam once a day (Caspian Tamin Pharmaceutical Company, Iran) and ten sessions of physiotherapy, all patients were called again by

phone, and the results were evaluated based on the acute pain severity questionnaire. The physiotherapy program included: TENS, infrared, ultrasound, exercise therapy daily up to 10 sessions. Patients who did not take regular treatment and did not attend the final visit were excluded.

2.3. Paraclinical diagnostic criteria

Simple radiographs were used to diagnose lumbar lordosis, scoliosis, spondylitis, spondylolisthesis and spondylolysis, and MRI and EMG-NCV were used to diagnose degenerative disc disease, herniated disc, tumors, and infection.

Questionnaire of Oswestry Disability Index was given to patients to determine their disability due to chronic low back pain. Validity and reliability of this questionnaire has been reviewed in previous research [16].

The questions of the questionnaire were categorized into ten sections (pain severity, self-care, lifting objects, walking, sitting, standing, sleeping, social life, travel, activities, and work or home environment). Thereafter, results were analyzed based on these categories. The answer to the questions was in the form of drawing a line around the option and for each question the scores were considered in the range of 0 to 5. Finally, according to the answers of the participants in the study, a score of 0 to 50 was attributed, and a percent of disability was assigned to each form. Oswestry's Disability Index (known as Low back pain Disability Questionnaire) is a very important tool for researchers in the field of individual disability. This tool helps researchers to measure the disability of individuals with low back pain and is considered as a "golden standard" among the tools for estimating the final performance of individuals [16].

2.4. Scoring the Oswestry disability indices

For each section of this questionnaire a maximum of 5 and a minimum score of 0 is considered. If all 10 sections of this questionnaire are completed, the individual score will be calculated as follows. For example:

Raw score taken by each individual = 16
Percentage of individual score = 32%
Overall test score = 50

Then, if any of the sections of the questionnaire is not completed, the score of the person is calculated as follows:

Raw score taken by each individual = 16
The total possible score for an individual = 45

Percentage of individual score:
Least the detectable change, with a confidence interval of 90%, is equal to 10% of the overall score (the change less than this may be due to the measurement error) [13,14].

2.5. Statistical analysis

Data analysis was performed using SPSS software version 16. For comparing two-state means and mean of independent or main variables, T-student and ANOVA tests were used. Then using the Post-hoc and Tukey tests, the comparison between subgroups was performed. Chi-square test was used to compare the gender distribution and history of trauma. In the studied group and if the Chi-square test was invalid the fisher exact test was used. The significance level of the tests was investigated in level of $P \leq 0.05$.

3. Results and discussion

A total of 817 patients were included in our study, of which 251 were males and 566 were females. 303 patients (37.1%) were in the group A and 514 patients (9.62%) entered in group B having other causes of back pain. The difference between the age distributions of two groups was significant, so that the majority of patients in group A were in the age range of 30 to 40 years, while most of the subjects of the second group (group B) were in the age group of 50-60 years. The most common cause of pain was found to be discopathy with 438 cases (53.5%), followed by

iliolumbar ligament enthesopathy and injured extensor muscles around the hip by 10.4% (85 cases) (Table 1). Only 2 patients in the group B (other causes of low back pain) had the highest disability according to the Oswestry pain severity questionnaire.

Table 1- Causes of low back pain in the patients

Percentage	Abundance	Causes of back pain
5.4	44	Iliolumbar enthesopathy
5.6	46	Short hip extensor muscle injury
5.0	41	Gluteal muscle injury
53.6	438	Discopathy
5.6	46	Short hip extensor muscle and gluteal muscle injury
10.4	85	Short hip extensor muscle and Iliolumbar enthesopathy injury
4.2	34	Gluteal muscle and Iliolumbar enthesopathy injury
0.9	7	Short hip extensor muscle and Gluteal muscle and Iliolumbar enthesopathy injury
5.5	45	Osteomalacia
0.4	3	Spondylolisthesis
3.4	28	Osteomalacia and discopathy
100	817	total

Before the initiation of treatment, most of the patients in the group A had moderate inability (285 cases), and the majority of the patients in the second group were suffering from severe disability (357 cases). Based on the test, there was a significant difference between the frequency distribution of patients in two groups regarding the severity of pain before the treatment (P = 0.0001).

Also, after treatment, based on the Oswestry questionnaire score, it was shown that most of the patients in group A showed the least disability (292 cases) and group B subjects mostly had moderate disability with 407 cases (Table 2). According to the normal distribution of data, based on the Chi-square test there was not a significant difference between the two groups in terms of pain intensity following treatment (P = 0.0001).

Table 2- Pain intensity in the patients before and after treatment based on oscilloscope questionnaire

		Pain intensity			
		Minimum disability	Moderate disability	Severe disability	Total
Before treatment	Group A	3	285	0	303
	Group B	29	126	2	514
After treatment	Group A	292	11	0	303
	Group B	103	407	4	514

The mean score of the Oswestry pain severity questionnaire was not statistically significant between two groups (P = 0.065) with regard to the normal distribution of the data using the parametric Independent Sample T-test before the treatment (P = 0.065) (Table 3). However, these scores were statistically significant in two groups following the treatment (P = 0.0001).

Table 3- Mean score of the pain intensity questionnaire according to the normal distribution of data

Subjects	Number	Average	Standard deviation	Standard error of mean
Group A	303	-27.2607	4.56970	0.26252
Group B	514	-15.0700	6.35890	0.28048

In current study, it was indicated that majority of patients with gluteal iliolumbar injury and injured short extensor muscles around the hip was in the age range of 30 to 40 years, while the highest proportion of patients with other causes of low back pain were between 50 to 60 years old. This difference was statistically significant and implies that in patients with younger age, careful examination of the causes of the lower back pain associated with iliolumbar ligament enthesopathy and injury of muscles around hip can reduce the many of paraclinic costs. In total, the most common cause of back pain was discopathy with 438 cases (56.3%). It was followed by patients who were diagnosed with iliolumbar enthesopathy and injuries of short extensor muscles around the hip (10.4%). In a prior study, it was shown that the prevalence of debilitating low back pain increased with aging beyond the age of 75, but the prevalence of non-debilitating low back pain did not change with age [5]. In our study, based on the Oswestry questionnaire the mean score of pain severity was 36.6 ±9.23 and 17 ±15.46 before and after treatment, respectively. Also, the highest density of this questionnaire was related to pre-treatment moderate and severe disability, and post-treatment moderate to mild disability. Based on the results of this criterion, in the men's group, none of the participants in the study scored the total scores of resting in the bed, while six women were in this group. These results show that most of the referred women had more severe pain compared to men, which is statistically significant.

It can be stated that women feel more pain than men or they express it more. Other reason that could be mentioned is vitamin D deficiency, which in previous studies vitamin D deficiency in women of reproductive age has been reported between 60-80%. Vitamin D plays an important role in muscle physiology and its deficiency can be accompanied by muscle weakness [17]. Also, the association of idiopathic back pain with osteomalacia and vitamin D deficiency has been reported in several researches [18,19].

Some limitations of the present study were as follows: lack of standard criteria in classifying the patients with low back pain and lack of matched control group without interventions in addition to long-term follow-ups.

4. Conclusion

The results of our study indicated that the degree of disability, paraclinical cost, diagnosis based on the correct clinical examination in patients could be different, and patients with injuries such as iliolumbar enthesopathy and injured short extensor muscles around the hip and gluteus responded well to conservative therapy. Additionally, in younger patients, this group of diseases is more likely to develop disability due to back pain. To obtain better results, the study of the effect of conservative treatments and their comparisons in matched groups in terms of underlying variables and with a greater number of causes of back pain is recommended.

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6. Conflict of interest

The authors declare no conflict of interest.

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