



PATIENTS WITH LOW BACK PAIN APPLYING TO THE EMERGENCY DEPARTMENT

Muhittin Emre ALTUNRENDE¹

¹ Health Science University, Clinic of Neurosurgery, GOP Taksim Training and Research Hospital, İstanbul.

ORCID Number:
https://orcid.org/0000-0003-3345-5821

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Address:
Muhittin Emre ALTUNRENDE,
GOP Taksim Training and Research
Hospital, Neurosurgery, İstanbul-Turkey
Phone: +90 532 362 38 54
E-mail: mealtunrende@msn.com
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ABSTRACT

Aim: Low back pain is a great loss of work force, on the other hand increases the workload in emergency services. The aim of this study was to determine the spinal degenerative pathologies in the patients with low back pain and to evaluate the effects of these pathologies on the emergency department.

Methods: Patients who applied to the emergency department with the complaint of low back pain and who were referred to the neurosurgery outpatient clinic were included in the study. Spinal degenerative pathologies was evaluated retrospectively in lumbar MRI examinations due to radiculopathy in the neurosurgery outpatient clinic or long-term low back pain in 3 months.

Results: 2220 patients 46.8% (n = 1039) women and 53.2% (n = 1181) men were treated with diagnosis code ICD (M54.4). The mean age was 40.12 ± 14.24. Lumbar MRI was performed in 31.2% (n = 693) patients. 43.7% (n = 301) 306 PDH 44.7% (n = 309) EDH, 38.6% (n = 267) LLF, 17.6% (n = 122) LSS was detected. LLF, PDH (RR 1,430, 95% IC, 1.190 to 1.730) and EDH (RR 1,410, 95% IC, 1.170 to 1,700) are seen 1.4 times more than those without LLF. LSS was observed in 1.7 fold (RR 1.786, 95% CI 1,285 to 2,480) more in patients with EDH.

Conclusion: It should be kept in mind that non-specific low back pain causes in patients admitted to the emergency department with acute low back pain are significant in terms of disc herniation, lumbar lordosis flattening and MC in MRI.

Keywords: Low back pain, emergency department, spinal degeneration, Modic changes, Lumbar lordosis flattening

Level of Evidence: Retrospective clinical study, Level III.

INTRODUCTION

Almost every individual is considered to have suffered from a back pain at least once in his life. Low back pain could be the result of mechanical causes as a result of spinal degenerative changes. Although there are socio-economic and cultural differences in many epidemiological studies, it is reported that the prevalence of low back pain (LBP) is 60-90 % / year^(4,6,8,13).

Ilhan et al. lifelong low back pain (LLBP) was determined as 79.4 %⁽⁴⁾. Waterman et al. reported that in the United States, back pain was 3.15 % of all emergency visits the emergency department with incidence and risk factors, and home injuries (65 %) accounted for the majority of patients presenting with

LBP⁽¹⁴⁾. Gilgil et al. LLBP frequency in their study in Turkey was determined to be 46.6 %⁽⁵⁾. Risk factors for low back pain are a wide range of people, including physical characteristics, socio-economic status, general medical health and psychological status, and professional environmental factors^(6,8,10). Among the causes of LBP, the most common causes are the mechanical, muscle spasm and spinal degenerative pathologies. There are differences in socio-economic and cultural reasons among patient behaviors that are faced with low back pain. We can list roughly the pain in the population of our hospital, those who expect pain to pass spontaneously, those who use analgesic drug without a doctor's advice, and those who apply to our hospital at the onset of pain.

The aim of this study is to determine the spinal degenerative pathologies which are the cause of emergency service in patients with LBP without neurological deficits presenting with LBP.

MATERIAL AND METHOD

Patients who applied to the emergency department of Gaziosmanpaşa Taksim Training and Research Hospital with the complaint of low back pain between 01.01.2018 and 30.06.2018 and who were referred to the neurosurgery outpatient clinic were included in the study. In the neurosurgery outpatient clinic, due to the complaint of radiculopathy or long-term LBP at least 3 months, lumbar MRI examinations were performed retrospectively in the presence of spinal pathology, disc herniation (DH), flattening in lumbar lordosis (LLF), lumbar spinal stenosis (LSS) and Modic changes (MC). Patients with trauma, under 18 years of age, oncology patients, patients with non-spinal pain (such as kidney stones), patients admitted to the neurosurgery clinic due to acute neurological deficits, and those who had previously undergone surgery for lumbar region were excluded. In addition, in our hospital PACS system, patients with more than one MRI and neurosurgery clinic were evaluated previously and excluded from the study. Thus, acute and subacute back pain were tried to be selected.

In this study, 1.5 T MR Unit (Signa HDxt; GE, USA) and body surface coil was used. Sagittal T1-W FSE, T2-W FSE and axial T2-W FSE (320x256 matrix, 4-mm section thickness, NEX 3) were imaged. We used the Miyazaki Rating System for evaluation of disc degeneration and Modic classification for evaluation of final endplate degeneration in MRI.

Statistical Analyses

Normality control was done by plotting one sample Kolmogorov Smirnov test, histogram, Q-Q plot and box

plot graphics. The data were presented as median, IQR (25.per.-75.per.), Frequency and percentage. Nominal variables were evaluated by chi-square test. RR (Risk Ratio) values of the variables were calculated. The significance limit was taken as $p < 0.05$ and bidirectional. The analyses were performed using the NCSS 10 software (2015. Kaysville, Utah, USA).

RESULTS

Among the determined dates, 2220 patients 46.8 % (n = 1039) women and 53.2 % (n = 1181) men were treated with ICD (M54.4). The mean age was 40.12 ± 14.24 . Lumbar MRI was performed in 31.2 % (n = 693) patients in the neurosurgery outpatient clinic. Of the patients undergoing MRI, 46.8 % (n = 323) were female and 53.4 % (n = 370) were male.

While 82.1 % (n = 569) of the patients had lumbar MRI, 17.9 % (n = 124) had no pathology. There were 31.2 % female and 31.1 % male in the group of patients with pathology and there was no significant difference between them. 43.7 % (n = 301) 306 protrudes disc herniations (PDH), 44.7 % (n = 309) extruded disc herniations (EDH), 38.6 % (n = 267) lordosis flattening, 17.6 % (n = 122) lumbar spinal stenosis was detected (Table-1).

17.5 (n = 100) patients had protruded and extruded disc herniation. 2.7 % (n = 19) Type-1 MC, 12.8 % (n = 89) Type-2 MC, 1.9 % (n = 13) Type-3 MC, 17.4% (n = 121) patients were MC (Table-2).

MC is associated with extruded DH ($p = 0,000$). There was no statistically significant difference between the two genders in all the parameters investigated. In patients with LLF, protruded DH (RR 1,430, 95 % IC, 1.190 to 1.730) and extruded DH (RR 1,410, 95 % IC, 1.170 to 1,700) are seen 1.4 times more than those without LLF. SS was observed in 1.7 fold (RR 1.786, 95 % CI 1,285 to 2,480) more in patients with extruded DH (Table-3).

Table-1. The distribution of pathological findings in both sexes in MRI.

	Pathology (+)	PDH	EDH	LLF	LSS	MC
Female	81,2 %	43,0 %	44,0 %	36,2 %	17,6 %	18,8 %
Male	82,9 %	44,3 %	45,3 %	40,7 %	17,6 %	16,1 %

Table-2. The distribution of pathological findings in both sexes.

	MC Type1	MC Type 2	MC Type 3
Female	2,2 %	11,4 %	2,5 %
Male	3,3 %	14,1 %	1,4 %

Table-3. The significance of protrusion and extruded disc hernia with other parameters.

	LLF	LSS	MC
PDH	$p < ,000$	$p < ,004$	$p < ,001$
EDH	$p < ,000$	$p < ,000$	$p < ,000$

DISCUSSION

Disc degeneration and herniation, lumbar spinal stenosis, paravertebral muscle atrophy, lumbar lordosis changes, vertebral corpus endplate changes (MC), facet joint degeneration, scoliosis, spondylolisthesis, spinal masses are the etiologic factors of low back pain. Among these reasons, disc hernia and lumbar spinal stenosis are the most common surgical procedures.

Waterman et al. reported that age, gender and race are important risk factors for the development of low back pain requiring treatment in the emergency department⁽¹⁴⁾. In İlhan et al., LLBP risk of their research in Turkey, body mass index higher, economic hardship living, elderly, short ones and uneducated people are also at high rates they published that it is LLBP⁽⁴⁾. Occupational factors, heavy lifting, frequent bending moment and long-standing survivors, workers and housewives increase the risk of LLPB. There are epidemiological studies in the literature. We have the same opinion that the difference of our study is to investigate the significance of the association of spinal pathologies with acute and subacute pain and spinal degenerative changes in emergency department applications. In our study, 2220 patients 47.2 % women (n = 1039) and 53.68 % men (n = 1181) were treated in the emergency department. Among these patients, 31,03 % (n = 689) patients underwent MRI by the neurosurgery outpatient clinic. Lumbar MRI 46,8 % (n=324) female and 53,2 % (n=369) male patients were evaluated. Watermen et al. reported no significant difference in rates of emergency department admissions for male and female low back pain⁽¹⁴⁾.

Our results were similar in both genders. In the evaluation of MRI revealed degenerative changes in 53.8 % men, 46.2 % women. There was no statistically significant difference between the two groups.

Low back pain risk factors are very versatile. anatomical features, socioeconomic status, any existing chronic disease, psychological status and occupational factors can be listed.^(6,8,10) Acute non-specific back pain is usually caused by severe physical activity and paraspinal muscle spasm after uncontrolled physical activity. In our study, there were 50.8 % (n = 63) male and 49.2 % (n = 61) female patients with MRI without pathological findings. In these patients, it was found that working conditions and socioeconomic conditions were effective in their anamnesis, and most of these patients were housewives, textile and construction workers. Our results in this group are consistent with the literature, especially in İlhan et al. for lifelong lumbar pain, prevalence and social - occupational risk research⁽⁴⁾.

Most of the low back pain is non-specific low back pain and mechanical back pain. This group of patients is the main part of the emergency department applications. Degenerative pathologies are usually caused by subacute

and chronic low back pain. This group of patients are admitted to emergency department for acute low back pain attacks. In our study, we investigated spinal degenerative pathologies and coexistence of these pathologies in patients without neurological deficit.

Temizturk et al. reported that the MRI of the patients with low back pain was associated with extruded, sequestered and posterolateral herniation and the findings of the examination, but not with other degenerative findings⁽¹¹⁾. Dora et al. have found a strong relationship between pain and disk extrusion in a study they have done⁽²⁾. However, Rankine et al. reported that a weak correlation was found between the pain level and the root compression in MRI⁽⁷⁾. Our results showed high extrusion and protrusion disc herniation. It is clear that these pathologies increase the patient's low back pain during the acute attack. In addition, the lumbar lordosis flattening, spinal stenosis, and Modic changes were significantly associated with extruded and protruding disc herniation (Table-3).

Boden et al. MRI of healthy people with low back pain revealed high levels of disc degeneration, but early MRI showed that degenerative changes were not clinically relevant at all times⁽¹⁾. At this point, patients with positive clinical findings may not always have degenerative changes in the MRI. In our study, there were 17.9 % (n = 124) patients without any pathology in the MRI.

The most important limitation of the study was a retrospective study and the fact that factors affecting non-specific low back pain could not be evaluated. But they applied to the emergency department with only back pain. And it was found that they benefited from non-steriod anti-inflammatory and muscle relaxant treatment applied in neurosurgery outpatient records.

Yıldız et al. reported that the flattening of lumbar lordosis increased after 40 years of age⁽¹⁵⁾. Dreischarf et al. Reported that the lower lumbar spine was flattened in the middle and became less mobile with aging⁽³⁾. In our study 38.6 % of the lumbar lordosis was flattened and protruded from DH (RR 1,430, 95 % IC, 1.190 to 1.730) and extruded to DH (RR 1,410, 95 % IC, 1.170 to 1,700) were seen 1.4 times.

In the MC prevalence study, Type-2 MCs were the most common in the whole spine, Type-3 MCs were the least common, and MC was 21.0 % in patients with low back pain⁽⁹⁾. In the same study, the prevalence of MC was higher in with spinal pain group. We were detected Type-2 MC (12,8 %, n=89) the most common and Type-3 MC (1,9 %, n=13) the least. MC is associated with extruded DH (p = 0,000). There are many articles investigating the development and prevalence of MC, and Thompson et al. reported that MCs had a strong relationship with pain and that Type 1 MC was more associated with other types⁽¹²⁾. In our study, Type-2 MCs were frequently seen.

In our results, Type-2 MCs were strongly associated with extruded disc herniation. However, it can be said that these patients are frequently associated with pain in Type-2 MCs due to pain and not being able to say this because of the lack of pain.

CONCLUSION

The limitation of this study, the retrospective nature of the study, and the pain scale could not be evaluated, The patients who applied to the emergency department but did not apply to the neurosurgery outpatient clinic did not reflect the general population.

In spite of their limitations, etiological factors are very wide range in patients who applied to emergency department in acute low back pain or low back pain attack. In our results, MRI was normal in 17.9. In 82.1 % of the patients, there was degenerative finding in MRI. There was a statistically significant relationship between acute low back pain attack and disc herniation, lumbar lordosis, flattening and Modic changes. Patients with acute low back pain who apply to emergency department should be referred to neurosurgery outpatient clinics.

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