



Risk factors and management of low back pain in primary care

Factores de riesgo y manejo del dolor lumbar en atención primaria

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Abstract

Introduction: Low back pain is one of the leading causes of disability. A primary care approach is paramount.

Objective: To determine the relationship between clinical data and risk factors in patients who presented symptoms of lumbar spine pain.

Methods: A cross-sectional study was carried out on 347 patients who presented symptoms of low back pain.

Results: in 19.31% of the patients, less than three months elapsed between the onset of pain symptoms and the presentation at the health center.

Conclusions: The main risk factors detected in the patients were smoking, the existence of trauma to the lumbar spine and a sedentary lifestyle.

Keywords: back pain, disability, primary care, risk factors. source: DeCS

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Resumen

Introducción: El dolor lumbar es una de las principales causas de discapacidad. Una aproximación en atención primaria es primordial

Objetivo: Determinar la relación entre los datos clínicos y los factores de riesgo en pacientes que presentaron síntomas de dolor en la columna lumbar.

Método: Se realizó un estudio transversal que incluyó a 347 pacientes que presentaron síntomas de dolor lumbar.

Resultados: en el 19,31 % de los pacientes transcurrieron menos de 3 meses entre el

inicio de los síntomas de dolor y la presentación en el consultorio.

Conclusiones: Los principales factores de riesgo detectados en los pacientes fueron el tabaquismo, la existencia de traumatismos en la columna lumbar y el sedentarismo.

Palabras clave: dolor de espalda, discapacidad, atención primaria, factores de riesgo. fuente: DeCS

Introduction

Low Back Pain (LBP) is one of the most common musculoskeletal pathologies and one of the leading causes of disability worldwide. This type of painful pathology can occur in



people of all ages, from children to the elderly, and is one of the pathologies with a very high approach in primary health care⁽¹⁾.

Although many risk factors are incriminated, such as age, sex, physical exercise, changes in posture, obesity, and sedentary lifestyle, the cause is not always certain and sometimes the diagnosis can be difficult to formulate. In addition, although it presents many symptoms, the etiology of low back pain is not entirely clear. Images captured by classical imaging techniques, such as flat X-rays, capture changes in vertebral statics but can only provide indirect signs of intervertebral disc damage or musculoskeletal damage⁽²⁾.

High-performance imaging techniques, magnetic resonance imaging (MRI) and computed tomography (CT) are the most conclusive diagnostic imaging modalities for disc or musculoskeletal pathology in the lumbar spine. Conservative treatment of low back pain involves lifestyle changes such as smoking cessation, limiting or avoiding strenuous physical exercise and other predisposing factors, and the use of lumbar spine orthoses⁽³⁾.

Pharmacological treatment consists of administering analgesics, steroidal and, more commonly, non-steroidal anti-inflammatory drugs, muscle relaxants, and neurotrophic⁽⁴⁾. In addition, physical methods used to treat pain symptoms in the lumbar spine can be thermotherapy, electrotherapy, and massage. Physiotherapy also plays an important role in reducing pain symptoms and recurrences⁽⁵⁾. Therefore, this study aimed to correlate clinical data and risk factors in patients presenting with symptoms of lumbar spine pain in the general practitioner (GP) office between October 2019 and March 2020.

The clinical study was designed to provide a series of data that, after statistical processing, will provide new information on the incidence, distribution by age group, sex, area of residence and professional activity of the population studied. This study also detected risk factors and correlated them with the symptoms and image changes highlighted in these patients.

Method

A cross-sectional study included 347 patients presenting symptoms of low back pain at the

primary care physician's office in Puyo, between October 2019 and March 2020. All patients in the study signed informed consent before their inclusion after receiving all the information about the protocols. This study was approved by the Universidad Regional Autónoma de Los Andes (UNIANDES).

The criterion for the inclusion of the patients in the study was the presence of low back pain symptoms. The data thus obtained were statistically processed to correlate the clinical and paraclinical data of the patients included in the study. The database and statistical processing of the data were performed and analyzed in the SPSS 26 statistical program (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used for the results collection, presentation and interpretation.

Results

The results of the distribution of the number of patients by age groups were as follows: 2.02% of patients were under 30 years old, 6.05% of patients were between 20 and 29 years old, 17% of patients were between 30 and 39 years old, 21.19% of patients were between 40-49 years old, 20.75% of patients were between 50-59 years old, 21.33% of patients were between 60-69 years old, while 10.66% of patients were over 70 years old.

The results of the study according to the sex of the patients were as follows: the study group consisted of 215 men and 132 women and presented a male: female sex ratio of approximately 2:1. In the group studied, the percentage of men was 61.96% and the percentage of women was 38.04%.

Regarding the level of daily physical activity, 172 patients, representing almost half of the patients included in the study, claim to have minimal physical exertion, or they work in an office or are retired. On the other hand, 126 patients, representing 36.31%, perform medium physical exertion, and only 49 patients claim to perform intense physical exertion in their daily activities.

The majority of patients, respectively 56.48%, presented to the family physician's office with low back pain of recent onset; in 19.31% of the patients, less than three months elapsed between the onset of pain symptoms and the presentation to the office. For 12.39% of the patients, it took between 3 and 6 months to



request a medical opinion, and for 6.92 % of the patients and 4.90 % of the patients, respectively, a longer time, an interval between 6-12 months, respectively more than one year was required to determine that they are adequately investigated.

There is a statistically significant relationship between the sex of the patient and the time

Table 1. Correlation between patient gender and time between symptom onset and first presentation to the primary care physician's office.

Onset of symptoms	Number of patients	Percentages	Female patients	Male patients
<1 week	87	25,07%	36	51
1-4 weeks	109	31,41%	52	57
<3 months	67	19,31%	21	46
3-6 months	43	12,39%	14	29
6-12 months	24	6,92%	6	18
>12 months	17	4,90%	3	14

Source: Own elaboration based on statistical analysis.

The main painful symptoms of the patients included in the study were localized low back pain in a significant percentage of patients - 89.91%-, radicular pain, referred to lower limbs in the case of 25.07% of patients, subjective sensory disturbances felt in the lower limbs extremities for 11,82% of the patients, distal motor deficit in the lower limbs for 1.73% of the patients, contracture of the lumbar paravertebral muscles found in 55.33% of the patients and also the appearance of a sensation of instability in the lumbar spine in 38.62% of the patients.

The main risk factor detected in the patients of the study group who attended the general

elapsed from the onset of symptoms to the first presentation to the primary care physician's office, with male patients presenting later in terms of the first symptoms, the p-value of the Chi-square test being 0.046 <0.05 (Table 1).

practitioner's office was represented by smoking: in almost a quarter of the patients: 36.6%, the existence of trauma to the lumbar spine in 6.63% of the patients, sedentary lifestyle in 27.95% of the patients, maintenance of a prolonged fixed position in 29.11% of the patients and intense physical exercise, occasional or daily, in 26.51% of the patients.

The analysis of the link between past spinal trauma and spinal instability found a strong statistical relationship (Chi-square $p = 0.00033 < 0.001$) (Table 2).

Table 2. Correlation between spinal trauma and spinal instability.

		Spinal instability	
		Present	Absent
Spinal trauma	Present	17	6
	Absent	118	208

Source: Own elaboration based on statistical analysis, $p \leq 0,05$

A statistically significant relationship was found between a sedentary lifestyle or maintenance of a prolonged fixed position and changes that

disturb spinal statics. Sedentary patients are more prone to develop static vertebral disorders ($p=0.0298 < 0.05$) (Table 3).

Table 3. Relationship between a sedentary lifestyle or the maintenance of a prolonged fixed position and the appearance of static vertebral disorders.

		Static vertebral disorders	
		Total	
	Total	227	120
Spinal trauma	198	120	78
Prolonged fixed position	149	107	42



Source: Own elaboration based on statistical analysis, $p \leq 0,05$

The main changes in vertebral statics highlighted in the patients included in the study were lumbar scoliosis found in 21.04 % of the patients, lumbar hyperlordosis in 11.82 % of the patients, inversion of the physiological curvature in the lumbar spine and the appearance of kyphosis in the lumbar spine in 1.15% of patients and the appearance of straightness of the lumbar spine in 31.41% of patients.

In 136 patients, consultation by the general practitioner was recommended based on pain symptomatology, the results obtained after anamnesis, clinical examination and classic laboratory and imaging tests. A number of 41 patients (22.82%) were referred to specialists in physical medicine and rehabilitation, 23 of the patients (6.63%) to rheumatologists, 29 of the patients (8.36%) to specialists in orthopedics and traumatology, 35 patients (10.09%) required neurology consultation, and in 9 patients, representing 2.31% of the total, neurosurgery consultation was considered necessary.

Of the 136 patients who benefited from a specialized consultation, 57 were evaluated with high-performance imaging techniques, mainly MRI and CT. In 7 patients who underwent MRI or CT, spinal listhesis at the level of one or more lumbar vertebral bodies was highlighted. In addition, most of the patients who underwent MRI or CT showed alterations in vertebral statics, both in the frontal plane, scoliosis in 21 of the patients, and in the sagittal plane, lumbar hyperlordosis in 13 patients, clearing of the physiological lumbar curvature in 27 of the patients and appearance of lumbar kyphosis in 3 patients.

Regarding the therapeutic approach of the patients with low back pain who went to the family doctor's office, the majority, respectively 336 patients representing a percentage of 96.83%, benefited from conservative treatment that led to the reduction or remission of the painful symptoms in the lumbar spine. However, in 11 of the patients included in the study (3.17%), surgery was required, in addition to the conservative treatment measures instituted, to remission the painful symptoms in the lumbar spine.

Among the patients included in the study, 93 patients required the granting of medical leave by the general practitioner and other specialists. The relationship between the age of the patients and the duration of medical leave was analyzed. The data show a strong relationship between the age of the patients and the duration of medical leave, with the Chi-square test having a significant value ($p=0.0254 < 0.05$).

Discussion

The incidence of low back pain is higher in the adult, active population during the period of productive work. In the study, the incidence is lower in patients under 20 years of age, which agrees with other specialized studies. The high proportion in the age groups 40 to 70 years may be explained by the occurrence of degenerative pathology⁽⁶⁾. In addition, there is a male predominance due to the type of effort they make at work since, most of the time, they do not have the patience to wait for conservative pharmacological treatment and rest to evolve favorably⁽⁷⁾.

Other authors state that male patients are more susceptible to the appearance of low back pain symptoms because disc degeneration is more important than in women, in all age groups, due to greater disc and musculoskeletal stress because male patients have longer diffusion-nutrition pathways⁽⁸⁾. The higher prevalence in men can also be explained by the height difference, which is an absolute value of 10.5 cm, the female body being generally 7% shorter than that of men. This height difference affects the posterior longitudinal ligament, especially its lateral portion⁽⁸⁾.

More than half of the patients in the study performed intense physical exercise, occasionally or daily, causing the appearance of low back pain. In addition, the intensity of physical exercise can have repercussions on the statics and dynamics of the spine; this type of activity accelerates the appearance of degenerative changes, which can be associated both with disc pathology and with muscular and ligamentous changes in the lumbar spine⁽⁹⁾.

The paravertebral muscles maintain normal muscle tone through minimal contractions that



ensure a vertical or horizontal position even when the patient does not perform physical activity, giving a body posture. However, in conditions of prolonged rest, and minimal or no physical activity, the tone of the paravertebral muscles begins to decrease. In this case, it does not help to maintain the spine in physiological position and posture, which may lead to lumbar discographies or other pathologies of the lumbar vertebrae⁽¹⁰⁾.

Vertebral trauma is an important risk factor for developing low back pain since it can later lead to pathologies that can endanger the patient's health. Likewise, accidents represent a cause for concern and their detection is fundamental to avoid developing low back pain, with a negative effect on the biomechanical integrity of the body⁽¹¹⁾.

Increased body mass index above normal values, especially obesity, leads to an increased incidence of low back pain. Obesity increases the risk of pain symptoms in the lumbar spine through several mechanisms: an excessive biomechanical load of the spine due to overloading, increased serum lipidemia and atherosclerosis, common in these patients, decreased blood transport of nutrients to the intervertebral discs, thus favoring the degeneration process, inflammation secondary to mediators released by adipocytes: adipocytokines (adiponectin, leptin and resistin)⁽³⁾.

Because, worldwide, the incidence of overweight and obese people is constantly increasing, at least in theory, the prevalence of low back pain is also increasing. In the literature, the risk of low back pain and relapses is 12 times higher in obese patients, with a body mass index greater than or equal to 30⁽¹²⁾.

One of the most frequent symptoms that patients present when they consult their family doctor is low back pain. It can be unipolar, which occurs only in the spine, or bipolar and refers to the lower limbs. Another common manifestation of low back pain is paralumbar muscle contracture due to irritation of the nerve threads in the dura⁽¹³⁾.

Patients may also have sensory disturbances that may be a criterion of severity if their character persists, and the appearance of motor deficits in the lower extremities usually

shows a prolonged or extensive root conflict. The sensation of instability in the lumbar spine may occur in a variable number of patients without having an important significance in assessing the degree of injury⁽¹⁴⁾.

The appearance of pain symptoms in the lumbar spine may be preceded by physical exercise, movement performed in bad dynamic conditions such as flexion or torsion recovery, prolonged exposure to cold, humidity, and microtrauma. The contracture of the paravertebral muscles in the lumbar area stands out in patients, in an orthostatic position, with the arms raised in the extension of the body or performing the movement of anteflexion of the spine⁽¹⁵⁾.

The changes that alter the statics of the spine in patients with low back pain symptoms can be both in the frontal plane and in the sagittal plane. The frontal plane alteration, scoliosis, can be *levo* or *dextroconvex*, compensated or not at the level of the dorsal spine. There may also be a deletion of the physiological lumbar lordosis: lumbar straightness or even an inversion of this curvature leading to the appearance of a lumbar kyphosis, which gives a reserved prognosis⁽¹⁶⁾.

Images captured by classical imaging means, such as plain radiographs, do not provide any direct signs of intervertebral disc damage or musculoskeletal damage. Instead, they can be interpreted as indirect signs of disease in the lumbar spine: elimination of lumbar lordosis, the appearance of lumbar scoliosis and narrowing of the intervertebral spaces, also called Barr's triad⁽¹⁷⁾.

High-performance imaging techniques, magnetic resonance imaging and computed tomography, are the most conclusive imaging modalities for disc or musculoskeletal pathology in the lumbar spine. MRI and CT techniques confirm disc herniation's diagnosis, location and severity. MRI investigation provides detailed images of the soft tissues of the spine. Moreover, CT reveals detailed images of the bony structures of the lumbar spine⁽¹⁸⁾.

The motion segment of the lumbar spine, L5-S1, also called the lumbosacral joint, is a transitional region between the lumbar spine and the sacral spine. In this region, the curvature of the spine changes from lumbar



lordosis to sacral kyphosis. L5-S1 helps transfer mechanical loads from the spine to the pelvis and lower extremities⁽¹⁹⁾.

Conservative treatment of low back pain involves lifestyle changes, smoking cessation, limitation or avoidance of intense physical exercise and other predisposing factors, and the use of lumbar spine orthoses. Pharmacological treatment consists of the administration of analgesics, steroidal and, more commonly, non-steroidal anti-inflammatory drugs, muscle relaxants, and neurotrophic.⁽²⁰⁾

Conclusions

The main risk factors detected in the study group patients were smoking, trauma to the lumbar spine, a sedentary lifestyle, maintaining a prolonged fixed position and intense physical exercise, both occasional and daily. Therefore, regardless of the etiology and the pathophysiological mechanisms involved in the appearance of low back pain, therapeutic management should be aimed at stopping the pain symptoms and preventing relapses.

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