

OCCUPATIONAL LOW BACK PAIN

MILTON HELFENSTEIN JUNIOR¹, MARCO AURÉLIO GOLDENFUM², CÉSAR SIENA³

Study conducted at the Rheumatology Department, Escola Paulista de Medicina, São Paulo, SP, Brazil

ABSTRACT

Occupational low back pain has multifactorial etiology and elevated incidence and prevalence. It is characterized by pain of varying intensity and duration and can lead to work incapacity and invalidity. Low back pain causes workers to suffer and increases the costs of employers and of social security and healthcare systems. The relevance of this subject led this paper's authors to undertake a bibliographic review with emphasis on the theoretical and conceptual background and on the experience of specialists.

KEY WORDS: Low back pain. Occupational medicine. Occupational health. Occupational risks. Spinal column. Spinal column traumas.

*Correspondence:

Rua João de Lacerda
Soares, 90 – Brooklin
São Paulo – SP, Brazil
CEP: 04707-010
m.helfen@terra.com.br

INTRODUCTION

Second only to headaches in the ranking of painful disorders that affect humans, low back pain is a common cause of morbidity and incapacity and is associated with significant social and economic impact^{1,2}. Epidemiological studies indicate that the prevalence of low back pain in the general population is between 50 and 80%³⁻⁵. Low back pain is one of the principal causes of medical consultations, hospitalizations and surgical interventions and commonly affects men over the age of 40 and women between 50 and 60 years of age; in the case of women this is probably the result of the increased prevalence and the consequences of osteoporosis⁶⁻⁹. Occupational low back pain is the largest single health problem related to work and absenteeism at most common cause of incapacity among workers aged less than 45, it primarily affects young adults and is responsible for approximately one quarter of all cases of premature invalidity^{6,10-12}. Since occupational lower back pain affects the economically active part of the population, is related to work incapacity, causes suffering to patients, involves costs due to lost productivity, days off work, medical and legal expenses and social security and insurance payments for invalidity, it should not only be analyzed as a medical issue, but also as a social and economic problem^{13,14}.

CLASSIFICATIONS

Low back pain can be classified as either primary or secondary, with or without neurological involvement;

mechanical degenerative; non-mechanical; inflammatory, infectious, metabolic, neoplastic or secondary to the effects of systemic diseases. There is also an important group of non-organic low back pain, which is extremely important in an occupational or compensation context, because of the frequency of secondary rewards related to these situations. Non-organic low back pain includes pain secondary to Munchausen syndrome (uncommon), simulated low back pain in the direct and conscious interest of obvious secondary rewards (usually financial) and psychosomatic low back pain, the consequences of psychological conflicts that are usually unconscious and which may or may not be concomitant with somatic complaints. Secondary rewards may also be related to psychosomatic back pain, although in a more complex manner than simple simulated pain. Low back pain can also be classified from the point of view of tissue damage of muscular or ligament origin: low back pain caused by fatigue of the paravertebral musculature and low back pain caused by muscle or ligament distension; originating in the spinal mobility and stability system: low back pain caused by lumbar spine torsion or unhealthy lumbar pelvic rhythm and low back pain caused by joint instability; originating in the intervertebral discs: low back pain caused by disc protrusion in the nucleus pulposus and low back pain caused by intervertebral disc hernia; or as predominantly psychological: low back pain as a form of psychosomatic conversion or with the objective of gaining secondary rewards.

The World Health Organization's International Classification of Impairments, Disabilities and Handicaps recognizes

1. Doutorado em Reumatologia - Assistente-Doutor da Disciplina de Reumatologia da Escola Paulista de Medicina, São Paulo, SP
2. Coordenador do Curso de Pós-Graduação em Medicina do Trabalho da Escola Superior de Gestão e Ciências da Saúde de Porto Alegre e Mestrando em Docência Universitária pela Universidade Tecnológica Nacional Buenos Aires/Argentina, Argentina
3. Reumatologista - Médico-perito da Justiça Federal da 3ª região – SP, São Paulo, SP

low back pain as a condition revealing loss or abnormality of the structure of the lumbar spine with psychological, physiological or anatomic etiology or, as a deficiency that causes a disability limiting or preventing full performance of physical activities. Still from the perspective of this classification, low back pain may be evidence of overuse, compressive or postural syndromes, be related to muscle imbalances, muscle weakness, reductions in amplitude or coordination of movements, increased tiredness or trunk instability¹⁵.

In 1984, Schilling proposed a classification of work-related diseases based on three groups:

I. diseases where work is a necessary cause, such as accidents at work and legally recognized professional diseases;

II. diseases for which work is one of the contributing factors;

III. diseases in which work aggravates or provokes a latent or preexisting disorder¹⁶.

Within the Schilling classification, occupational low back pain may be classed as Schilling II, if work is considered to be one of the factors contributing to onset, or Schilling III, if work is considered to be an aggravating factor in a preexisting disorder or pathology.

Low back pain can also be classified according to the clarity with which an etiologic diagnosis is arrived at; specific, when the cause is well-defined, for example, caused by a case of disc herniation, or nonspecific, when the diagnosis is ill-defined. Nonspecific low back pain accounts for 80% of all cases recorded in adults and primarily affects people aged 20 to 55¹⁷. It can be classified further as either static, when caused by poor posture (static overload), or kinetic, when caused by dynamic overload.

Acute low back pain, which is generally related to damage to ligaments, muscles and/or intervertebral discs, is characterized by pain of sudden onset with a duration of less than 6 weeks. In the majority of cases it is self-limiting and mean duration is 1 to 7 days. Around 90% of patients recover spontaneously, 60% return to work within 1 month and 30 to 60% of patients may suffer a pain relapse in 1 to 2 years¹⁸⁻²⁰. Subacute low back pain has a duration of six to twelve weeks. In these cases, return to normal function takes up to 3 months²¹. Chronic low back pain occurs in just 8% of cases, lasts longer than 12 weeks, compromises productivity and is less likely to be cured completely.^{7,21} In a study undertaken in Brazil, 76.7% of people with chronic low back pain suffered pain with sufficient intensity to compromise their work.¹¹

ETIOLOGY AND RISK FACTORS

Since, in the majority of cases etiology is multifactorial, identifying a single cause or even the principal cause of low back pain is an extremely difficult task^{19,22,23}. Both individual and professional risk factors are involved in the genesis of low back pain. The most common individual risk factors are: age, sex, body mass index, muscle imbalances, muscle strength, socioeconomic conditions and the presence

of other infirmities⁷. The most common professional risk factors involve incorrect movements and postures caused by inadequate working environments, the functions of available equipment and the ways in which work is organized and carried out⁷.

The causal factors most directly related with occupational low back pain are mechanical, postural, traumatic and psychosocial^{22, 23}. Age, posture and fatigue at work are considered factors that contribute to the high percentage of low back pain relapses. Working long hours, heavy duties, lifting weights, lack of physical exercise and psychological problems are some of the factors that contribute to low back becoming chronic¹⁹. Frequent complaints of pain in the lumbar spine are associated with paravertebral muscle tension caused by uncomfortable positions and premature degeneration of intervertebral discs due to excessive physical exertion. It is believed that many cases of low back pain are caused by abnormal pressures on the muscles and ligaments that support the spinal column. Both the dynamic forces related to displacements, carrying loads and using steps, ladders or stairs, and the static forces related to supporting heavy loads, to uncomfortable positions and to restriction of movement, can contribute to injuries to joints and to intervertebral discs^{7,24}. Factors that have been identified as conferring a risk of occupational low back pain include cumulative traumas, dynamic activities related to movements of trunk flexion and rotation, heavy physical work, bending or squatting, macro traumas, lifting or carrying loads, exposure to long work shifts without pauses, whole-body vibrations and static and inadequate postures^{6,11,25-30}.

Many different factors have been identified as contributing to painful lumbar syndromes becoming chronic, in particular psychosocial factors, dissatisfaction with work, inactivity, obesity, smoking, performing heavy duties, depressive syndromes, employment lawsuits and tribunals, climatic changes, genetic and anthropological factors, changes in atmospheric pressure and temperature, postural habits and educational level³¹⁻³⁹. Risk factors for chronicity and incapacity from nonspecific low back pain include previous history of low back pain, absenteeism during the previous 12 months, pain irradiating to the legs, reduced amplitude leg elevation, signs of neurological involvement, reduced muscle strength and stamina of the trunk, physical unfitnes, smoking, signs of depression and psychological stress, low job satisfaction, personal problems related to alcohol abuse, marital problems and financial difficulties⁴⁰.

Other authors emphasize the importance of psychosocial aspects, and conclude that there is a strong psychosocial factor in incapacity related to chronic low back pain that is so strong as to predict which patients with acute low back pain will require early intervention to prevent progression to a chronic state⁴¹.

One study found that preexisting differences in health status were not associated with differences in the behavior of patients with chronic low back pain or with reported pain scales. Progression of symptoms and reported pain

had a statistically significant relationship with secondary social and economic rewards. This finding is of fundamental importance for healthcare professionals involved in assessing these patients, in particular employment compensation doctors⁴². The same study divided patients with chronic low back pain into classes, depending on their degree of social and economic interests (potential rewards); comparing groups of patients with the same degree of "social rewards", but with different secondary economic rewards. The greater the secondary economic reward linked to the behavior of the disease was, the greater the number of days off sick, the greater the number of complaints of domestic incapacity and the more frequent depression. In a group with the same level of secondary economic rewards, the greater the secondary social reward was, the greater the number of days off sick, the greater the number of complaints of domestic incapacity and the more frequent depression, revealing that the secondary rewards had an equal influence on these parameters, irrespective of whether they were economic or social. The only differences observed between these groups were related to pain and nonspecific symptoms. Patients with chronic low back pain who were in the group with greater secondary social interests reported greater pain intensity and more nonspecific symptoms, which are common to diseases related to chronic anxiety⁴².

This is a reminder of the undeniable fact that treatments directed exclusively at the physical component (rest, localized exercises, local heat, etc.) may not stimulate the desired therapeutic effects. Freud concluded that secondary rewards are the major problem for psychoanalytic treatment. This Freudian deduction is confirmed by the objective data cited above, with relation to management of chronic low back pain⁴³. The intense modification of behavior and of the clinical course of the disease caused by secondary rewards have also been investigated by other researchers⁴⁴⁻⁴⁷.

There are also risk factors or factors associated with chronic low back pain, which are apparently bizarre, but which it is equally necessary for specialists and compensation doctors and other professionals involved to be aware of. Foremost among these is the influence of solicitous spouses (or partners) on the pain reported or felt by the patient. Studies demonstrated that the greater the solicitousness (dedication, gentleness, detailed care) of the partners of patients with chronic low back pain, the greater the intensity of the pain they perceived and the greater the degree of incapacity they reported, irrespective of other factors⁴⁸⁻⁵¹. It should be pointed out that this factor is actually part of the secondary rewards, bearing in mind that the greater the pain or incapacity reported, the greater the patient's appeal for solicitousness, sympathy and attention from their partners or spouses. Finally, a recent study demonstrated that low back pain with gradual onset was significantly associated with psychological aspects and not with occupational activities⁵².

DIAGNOSIS

The elevated incidence of abnormal findings in imaging exams conducted on asymptomatic people mean that it is imperative to correlate these findings with information from patient history and physical examinations. It should also be pointed out that dissimulation maneuvers should generally be employed. A diagnosis of occupational low back pain also demands detailed occupational history taking and careful analysis of the way work is organized and of the environment in which it takes place.

It is not enough to simply wait for the patients to mention their complaints. They should be actively elicited. The physician must avoid adopting a posture of directing questioning exclusively at symptoms located in the lumbar region and expand the arsenal of questions in order to detect with greater precision the true origin of low back pain and characterize the non-organic symptoms that are often present, without being led by the appearance of imaging exams.

Sudden "loss of strength" of a muscle or group of muscles (instantaneous refusal at a certain point during a maneuver requiring strength) is behavior that is characteristic of non-organic pain. Diseases that cause muscle weakness manifest during physical examination with a consistent degree of loss of strength. This loss of strength (smooth and constant) is almost impossible to simulate for people with non-organic symptoms.

The possibility of allodynia should always be investigated, and attention should be paid to possible histrionic facial expressions, trembling and exaggerated verbalization of pain, which is not to be expected even in painful diseases with organic causes. Some patients may exhibit increased diaphoresis or fainting. In general, fainting conforms to the characteristics of psychogenic syncope or non-epileptic psychogenic convulsions, in which patients' falls never result in head traumas (when observed directly by a physician), among other details that are beyond the scope of this paper.

Patients who claim to be unable to work because they are lame, should have signs of uneven shoe sole wear. Symmetrically worn soles (in the absence of heel deviations) may be a sign that the limping or claudication is non-organic. Using questionable or unprescribed orthoses, including walking sticks and kidney belts, is another sign associated with non-organic complaints, especially when there is no corresponding atrophy or cutaneous signs of prolonged use.

Checking for calluses on the hands may verify whether a worker is indeed leaving off physical activities. Lacerated hands and dirt under the nails are also useful signs. An absence of muscle atrophy after a prolonged period of inactivity and maintenance of muscle tone of the trunk and pectoral girdle are indications of non-organic pain.

The World Health Organization (WHO) warns that fibromyalgia should not be ignored as a common cause of chronic low back pain. The WHO publication states that "chronic back pain is a more difficult problem, which often has strong psychological overlay: work dissatisfaction,

boredom, and a generous compensation system contribute to it. Among the diagnoses offered for chronic pain is fibromyalgia." It also states that "although disc protrusions detected on X-ray are often blamed, they rarely are responsible for the pain"⁵³.

Many patients with fibromyalgia only complain of regional pain during consultations, and those with chronic low back pain should also be assessed for the possible presence of this syndrome⁵⁴, bearing in mind that patients with chronic low back pain tend to present with pain in other anatomic sites and nonspecific symptoms, when there are secondary interests⁴².

Another publication, which supports the WHO's warnings, states that the appearance of intervertebral discs is not a predictive factor of greater occupational functional limitations. That study was conducted using a larger and more appropriate cohort than previous studies. It found that there was only a weak statistical association between moderate or severe disc abnormalities and poor prognosis. Not even a provocative discogram is capable of predicting any type of future adverse event related to back pain or to work. The authors concluded that the incapacity of patients with chronic low back pain, even those with significant abnormal intervertebral disc imaging findings, cannot be assessed on the basis of the appearance of their discs on imaging exams. The only factors capable of predicting incapacity related to chronic low back pain, with a significant statistical power, were psychosocial factors⁵⁵.

PROGNÓSTICO

The occupational prognosis of patients with chronic low back pain should not be based on the appearance of images (degeneration of discs or osteophytes) of the lumbar spine of the patient or compensation seeker⁵⁵. Detection of signs suggestive of non-organic pain does not imply poor prognosis - if patients are treated properly. The presence of unfavorable psychosocial factors can predict a greater number of days off work, if the sufferer is not treated correctly. One group of researchers has proven that even patients with apparently refractory chronic low back pain strongly associated with psychosocial factors may exhibit significant improvements, if managed with multidisciplinary rehabilitation that adequately deals with the somatic symptoms and not just the regional physical pains or with supposed anatomic findings that are of little relevance⁵⁶. Another study supported these conclusions that treatment and improvement is possible with patients with chronic low back pain, even in long-term cases⁵⁷.

This raises the need to better publicize these technical concepts and evidence among compensation doctors, given the countless invalidity retirements for chronic low back pain. Systematically ignoring this medical evidence cannot have any other result than to substantially increase public expenditure, reducing the number of economically active people in the employment market and causing irreparable damage to the patients themselves, who would have a chance

of being treated, were they not so labeled. In some cases it may be necessary to change employment activities, not retiring because of invalidity, but undergoing professional rehabilitation or simply changing duties.

The true findings that there are solutions for chronic low back pain, if correctly managed, find their logic in the results published by Rainville et al., which reveal that patients who won financial compensation (e.g. favorable employment tribunal or compensation claim outcomes) reported more intense low back pain than patients who apparently had the same condition but did not receive compensation⁵⁸. The rationale of cause and effect could be questioned, in this case, on a logical basis. It could be postulated that those with chronic low back pain who received financial compensation had more severe spinal injuries, justifying their financial gains. However, this logic loses force when confronted with findings published by Rohling et al., who demonstrated that patients who received financial compensation did not have more severe injuries than those who did not receive it.⁵⁹ Financial compensation does in fact have an influence on reported pain in the context of chronic low back pain.

PREVENTION

Prevention of occupational low back pain involves physical, organizational and cognitive measures. The physical measures should deal with the biomechanical aspects, posture at work, handling of material and loads, repetitive movements, job descriptions and occupational health and safety. Organizational prevention should focus on communication, on resource management, on job descriptions, on the organization of time at work, on teamwork, on paradigms of work, on cooperative working, organizational culture, organizational networking, teleworking and quality management. The cognitive component involves studying psychological processes, mental workload at work, decision making, specialist performance, man-machine interaction, stress and training. In this way, the psychosocial factors that contribute to the emergence of occupational low back pain can be prevented, including job dissatisfaction, monotonous work and the wear provoked by work overload, by the lack of autonomy and by competition with colleagues^{18,60-62}.

TREATMENT

Elimination of risk factors, drug treatments, physiotherapy and patient reeducation are the foundations of occupational low back pain treatment.

With regard to physiotherapy, no scientific evidence has yet been found that electrotherapy with local heat or electrical stimulation have any proven relevance for the treatment of chronic low back pain. It is guided physical exercise that is most relevant to treatment. Although the majority of episodes of low back pain are self-limiting, they should be treated promptly and effectively in order to avoid progression to chronicity. Once specific causes have been ruled out, treatment should be centered on symptomatic pain

control in order to allow functional recovery as quickly as possible^{39,63}. During the acute phase, rest is effective, but should not be prolonged because of the deleterious effects of inactivity on the locomotor system^{39,64,65}. Where there are inflammatory processes, treatment should cover, in addition to anti-inflammatory medication, alleviation of overloads and promotion of a working environment that is favorable to the reestablishment of good health. Corticoids can benefit patients with disc herniation and radicular involvement^{39,66}. Muscle relaxants are indicated in cases of acute low back pain with associated muscle contracture. Muscle relaxants combined with other anti-inflammatories and analgesics can provide additional pain relief^{39,67}. Tricyclic antidepressants can have good results in chronic low back pain cases, even when there is no depression present³⁹. Epidural infiltration of glucocorticoids, anesthetics or opiates is an option for the relief of acute radicular pain after conservative treatment has failed.^{39,68,69} Surgical treatment of low back and sciatic pain due to herniated discs is indicated in cases of significant neurological involvement or of absolute failure of clinical treatment.

Multidisciplinary treatment has proven effective for improving the prognosis of patients with chronic low back pain^{56,57}. However, physicians should be cautious about mentioning the influence of psychosocial factors to their patients, because of laypeople's limited understanding of the true origin of their low back pain, so that confronting patients directly (explaining that their symptoms are unrelated to the imaging results and actually have a psychological or socio-cultural origin) is unwise and should be avoided, since such action may result in patients who are unconvinced abandoning treatment or may even cause inappropriate and prejudicial behavior⁷⁰. Explanations should not devalue the symptoms reported by patients.

Since no differences have been detected between flexion or extension for the lumbar spine, it was established that nonspecific exercises should be recommended⁷¹. One group of authors has concluded that physical rehabilitation for chronic low back pain should emphasize more intense exercise, canceling out the influence of these patients' tendency to limit their own movements (kinesiophobia). Correct physical activity effectively reduces pain, both anticipated pain (fear of pain), and pain induced by movement, and there is no doubt about the positive influence of physical exercise for reducing work incapacity⁷².

FINAL COMMENTS

Chronic pain should not be differentiated from acute pain merely on the basis of duration of pain, but also on the basis of its biopsychosocial features, since it is influenced by psychological and cultural variables. Patients with chronic low back pain may exhibit distorted behavior resulting from beliefs and feelings that they experience. The term kinesiophobia is used to define the excessive and irrational fear of movement and physical activity that results in feelings of

vulnerability to pain or in fear of recurrence of injuries. This can lead to inactivity and the fear of pain becomes more provocative than the actual movement being undertaken.

Physicians should be alert to signs indicative of non-organic pain, correctly employing specific semiological maneuvers, which are indispensable when assessing such patients. Correct diagnosis is fundamental to institution of best practice, which will benefit those suffering from chronic low back pain and, indirectly, all of the services involved in the costs generated by these patients.

Imaging findings (particularly, disc degeneration or marginal osteophytes) do not always have a relationship with the degree of patient incapacity; it is psychosocial factors that prove to be most relevant (with a high evidence level) for predicting the course of each case.

The scientific evidence demonstrates that multidisciplinary treatment is effective for improving chronic low back pain, even when it is long-term or strongly related to psychosocial factors. Emphasis should be on physical exercise of relevant intensity, avoiding reinforcement of pathological kinesiphobic behavior. Physical exercise has proven effective for the treatment of chronic low back pain for reducing incapacity.

These conclusions add weight to the need to restructure regional physical rehabilitation services, whether public or private, for treatment of patients with chronic low back pain. The multidisciplinary approach, with appropriate psychological and social support, may incur increased costs initially, but will prove to be less costly over the long term, because of reductions in the number of medical consultations and lost work days, in addition to reducing social security and pension costs, without compromising patients, since this unified solution is primarily aimed at reestablishing their good health.

Conflicts of interest: none

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