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1) Thinking about your patients, in the last two years, how many of them have come to you for disorders related to the musculoskeletal system (e.g., lumbago, neck pain, muscle stiffness, etc.)?

In 2020, during the lockdown imposed by Italian health authorities as a result of the COVID-19 pandemic, there was a major increase in patient-reported musculoskeletal disorders, probably as a result of travel restrictions and also because of the remote work from home.

A national research study has documented that one out of every two Italians has suffered more frequently from pain symptoms at the level of the musculoskeletal system. Let us consider that at the beginning of 2020 we were one of the countries with the lowest number of people working from home; the percentage was around 8% and then, during the health emergency, this percentage rose to 69%. Clearly, the need to find new spaces and new working hours has led to a change in habits from a physical, postural and psychological point of view and it is possible that these new habits will persist even after the end of the pandemic period.

Indeed, it appears that more than 50% of workers who have experimented with remote working in recent months will continue to work this way.

Another extremely relevant issue was the lack of a clear division between time spent on work and the necessary rest as part of work activity. Think, for example, of the countless video calls made in front of a PC. This has resulted in having to keep a certain posture at the desk longer, reducing all those occasions that also allowed for a change of position or stretching the lower limbs in particular.

Then there is an increased state of stress or anxiety that has inevitably affected all of us during these difficult months. These stressful conditions have particularly affected home-based workers because there is increased uncertainty about the future and some difficulty in the experience with a completely new work environment. All of these non-ergonomic physical positions and the psychological impact have resulted in an increase in musculoskeletal disorders over the past two years.

However, during remote working, 21% of patients have reported a subjective worsening of neck pain. Let us consider a known fact: those who work in front of a monitor, a video terminal, are 30 to 60 percent more likely to develop neck and shoulder pain or pain in the upper limbs. In particular, the cervical spine is the site most affected by these disorders and has a prevalence of about 5% over lifetime, affecting mostly women. Obviously, increasing the time spent in front of a video terminal, moreover in postures that are not always appropriate, has resulted in an increase in painful musculoskeletal symptoms that are then reported to general practitioners and to us specialists.

2) How prevalent are musculoskeletal disorders?

Pain in the spinal column, cervical spine and lumbar spine is the second cause after headache (migraine) of work-related disorders or conditions, especially in the population under 40 years of age.

These figures are therefore extremely important from an epidemiological point of view since they also represent one of the main causes of absence from work due to the pain and functional limitation that is felt in conjunction with moments of acute low back pain. Overall, therefore, about 7% of the world's population suffers from this condition.

The World Health Organization has reported, particularly in the working-age population, that 20-40% of workers who suffer from low back pain experience an episode of acute low back pain and if the patient is not taken care of in a careful, accurate, and multidisciplinary/multimodal manner they will experience recurrences. This percentage is extremely concerning if one thinks that after an episode of acute low back pain in 85% of cases there will be further episodes of back pain if not properly treated.

3) What are the most common underlying causes of these disorders?

A recent publication in the European Journal of Physical Rehabilitation Medicine gave what I think is an enlightening definition of low back pain: low back pain is a symptom in search of a disease. This is because it is very difficult, among the many causes that can determine the onset of back pain, to identify what is actually determining the painful symptoms at that given moment, in that patient. Beyond objective clinical findings, although there are diagnostic and imaging tools available to specialists, very often it is very difficult to determine the organic cause of back pain.

It is therefore crucial to have an accurate clinical picture to determine whether it is necessary to introduce some screening elements such as imaging and radiography or MRI in the diagnostic process and then set up an appropriate rehabilitation and pharmacological treatment.

Therefore, low back pain cannot be attributed with certainty to a single pathology. Psychological elements and social factors definitely play an extremely significant role in back pain. This is because they determine not only an increased onset of muscle spasms in the para-vertebral muscles, whether cervical, dorsal or lumbar, but also because they favour the chronicisation of pain symptoms. Indeed, acute low back pain, if not properly treated from both a pharmacological and behavioural point of view, can make the problem become chronic.

This triggers complex biochemical mechanisms that accustom the body to feel pain, making it much more difficult to resolve it. Some factors in particular influence the possible chronicisation of pain, such as advanced age or poor general health with diseases and concomitant clinical issues, as well as psychological stress, situations of anxiety or agitation, resulting from the presence of diseases, play an extremely important role. This is because they lead to a change in a patient's posture and mobility throughout the day and this worsens the predisposition towards the pain symptom. What is known as Fear of Movement may occur for fear of feeling pain, which results in a significant limitation of activities in daily life, and limits compliance with therapeutic exercises necessary to resolve these clinical problems and to prevent relapse.

These aspects also have a significant impact on individuals with low incomes, who are unemployed, or who have working hours with a lack of proper alternation of work and rest time or who are, for example, engaged in manually handling loads. Therefore, it is essential to know and understand what are the factors that can determine a chronicisation of back pain and that can affect it, making it particularly severe. In addition to occupational factors, there are psychosocial factors, such as stress, anxiety, mood disorders, cognitive problems and predisposition to pain and its perception.

Not to be forgotten are individual factors such as age. We have talked about the predisposition to physical activity and sports, but let us not forget smoking or excess weight, i.e., obesity. As regards the possibility of back pain becoming chronic, therefore, these are all aspects that a clinician needs to consider in order to set up a comprehensive and multimodal treatment that can benefit the patient.

4) The particular symptoms that characterise:

- **Low back pain**
- **Neck pain**

Low back pain is a symptom related to pain located in the back of the body between the lower margin of the twelfth rib and the lower gluteal fold. Low back pain may be associated in some cases - when a nerve root is involved - also with pain reported in the limbs.

The same applies to neck pain, or pain at the neck of the cervical spine. The symptoms in these cases can also radiate to the upper limbs or even to the head, in the frontal area near the oral fissure or cheek.

We are therefore faced with two problems that mainly affect the pain symptom, which also results in a subjective perception of stiffness, limitation of movement, and an inability to perform normal activities of daily life correctly, smoothly and free from pain. However, as the medical terms lumbago and cervicgia indicate, the symptom of pain is clearly the cornerstone of patients' accounts and is also the most disabling and debilitating aspect in their daily routine.

A recent paper from the European Journal of Physical Rehabilitative Medicine reports the multiple causes that can result in low back and neck pain as an extraordinarily complex and intricate overall condition, such that, as the journal writes, "we are all searching for the Holy Grail, the algogenic cause of low back pain". So the issue of pain is really crucial and central. This Holy Grail is difficult to find, to discover, because the causes are multiple and very often it is difficult to directly correlate the pain to the clinical problem reported by the patient.

5) Pain is indicatively a symptom always present in subjects suffering from these disorders. In what percentage is there a sharp pain that limits movement?

And in how many patients is the pain recurrent or persists over time so as to severely limit daily activities?

Low back pain is the cause of about 70% of the years lost in working age by workers. This is because it strongly impacts the ability to perform normal professional tasks. How much the impact of the pain symptom can be limiting for the professional activity of a worker, but also costly for society and the health system. A Swedish research study from a few years ago tried to calculate how much an episode of acute low back pain can cost a patient. The cost was estimated at about 2,700 euros.

These elements lead us to think about the costs that no or incorrect treatment of low back pain can have both for each individual patient and for the community. When a clinician prescribes pharmacological therapies or instrumental exams that are not consistent with the guidelines, he/she incurs costs as a result of having requested imaging too early or, in more problematic cases, surgery without first exploring all possible and necessary conservative therapies.

6) When is it necessary for an individual to see their primary care physician and when to see a specialist, such as a physiatrist?

A clinical evaluation by both the general practitioner and the physiatrist must first take into account some so-called red flags.

The red flag is the age of onset (in the absence of direct traumas): very young children or subjects in advanced age may need particularly thorough clinical investigation. Then, there are all those subjects who have recently suffered a spinal column trauma. This category also includes subjects with a clinical history of major problems such as cancer.

How and which symptoms manifest guide the specialist in deciding whether to be more or less cautious about pain symptoms when there are neurological disorders such as problems with strength, difficulty in moving a limb and problems affecting sensitivity, tingling and "electric shocks".

Other cases that need special attention are: pain in the spinal column associated with chest pain (because it could be the consequence of non-spinal causes) or pain accompanied by sudden, rapid and unexplained weight loss.

7) What factors can relieve or exacerbate pain?

Speaking of neck pain, women are most frequently affected by this disorder especially when they spend long hours working in front of a computer monitor.

Another relevant aspect is certainly the body mass index, i.e., the presence of excess weight; increased weight is indirectly related to a lack of regular physical activity. Scarce exercise may predispose to a worsening of low back pain conditions or the onset of recurrence.

We also know that work factors related to workplace ergonomics can lead to the onset, worsening, or persistence of a musculoskeletal problem, particularly in the spinal column, for example: workstations that force the rotation of the head, an incorrectly positioned screen, altered lighting of the room or the incorrect posture that a worker usually has in carrying out his or her work. In general, work is very often of central importance.

Then we have the whole issue of the psychological and social factors related to the state of anxiety and stress and also to the acceptance of the work activity itself and the perception of pain. All of these factors predispose to the onset of low back pain and can clearly affect whether recurrence occurs.

There are some precautions that can be followed daily during work for the prevention of these problems: avoid keeping the same posture for a long time, especially if incorrect, choose an ergonomic position in front of the video terminal, with characteristics of the seat, screen, or desk or the position in which one rests the upper limbs to allow avoiding muscular and tendon overloads. Let's think, for example, of the desk or chair: they should be adjustable in height for example, always ensuring proper positioning of the feet on the ground; alternatively, one can use a support for the feet so that the lower limbs form an angle of 90 degrees, the back should always be kept leaning against the backrest properly erect, thus avoiding slipping on the workstation or curving on the desk because this can lead to muscle overloads at the level of the spinal column.

Also the position of the arms is to be controlled: working with the keyboard or the mouse, the arms very often can suffer problems such as tendon problems in the shoulder. The forearms should be kept horizontal on the desk, parallel to the work surface and it is important and useful in some cases - especially when suffering from mild pain in the wrist extensor muscles - to choose an ergonomic mouse or a wrist rest near the mouse. This avoids overloading all the muscles of the upper limb while using the keyboard and mouse.

Obviously, the position of the cervical spine plays a fundamental role in the possible onset of neck pain: the position of the screen must be frontal and not lateral with respect to the posture. This is because forcing a worker to keep a rotated head position can expose the trapezius muscles in particular to be stably contracted and thus develop spasms and facial syndromes. In addition, it is always important to stay active, keep moving, and avoid standing still for a long time in the same position. After an episode of acute low back pain, rest is recommended for a short period of 1-2 days maximum, but should not be encouraged for longer periods because it would favour the chronicity of the symptoms and make it even more difficult to return to the activities of daily life.

Therefore, we should remember to recommend controlled motor activity or at least it should be followed in the early stages to verify that the exercises are done correctly, avoiding bed rest and protection of the lumbar spine. The patient must understand how to move correctly by relying on the work of physical therapists to learn how to move and use the spinal column correctly.

Performing movements and exercising correctly instead is the best way to prevent this issue from significantly impacting our daily lives.

8) How is it possible to intervene to manage and resolve these issues (e.g., pharmacological and non-pharmacological treatments)?

Specifically, what options are available to treat musculoskeletal pain?

Significantly, a publication in 2008 reported a "supermarket-type approach" offered to subjects with low back pain or clinicians, thus with the availability on the market of many products to choose from based on individual preferences or on how they are presented. Of course, this cannot be the right way because it does not allow personalising treatment (pharmacological and/or non-pharmacological) nor especially to go deep into the diagnosis and understand what may be the causes of the back pain.

Many international guidelines suggest the use of nonsteroidal anti-inflammatory drugs (NSAIDs) because they reduce the inflammatory state reported at that moment by a patient, especially in acute phases. This certainly is an appropriate therapy just for acute conditions, when inflammatory issues occur suddenly.

However, it is not always the only or best treatment to pursue. In some cases, for example, a clinician needs to manage somatic muscle pain resulting not so much from an acute inflammatory state, but from a prolonged state of muscle contracture.

In these cases, NSAIDs are less effective than analgesics designed to treat pain. A multimodal approach that resolves the inflammation as well as the state of contracture protracted over time.

Medications with a relaxing or antidepressant function may also play a role. This is because psychological and social aspects, state of anxiety, and mood can significantly impact especially the state of contracture of the muscles. In some cases, especially when there is a state of chronicisation of pain symptoms, it is possible to resort to different classes of drugs, up to treatment with opioids. Let us not forget the therapeutic opportunity represented by nutraceuticals especially in maintenance conditions of low back pain. Some molecules that are not necessarily pharmacological can provide significant support by preventing the flare-up of low back pain.

In addition to all possible pharmacological treatments, we also have many non-pharmacological approaches that we should consider and propose on a regular basis to resolve the symptoms. Certainly in a multimodal approach to the patient, therapeutic exercise must play a key role. Physical therapy is recommended by all major guidelines dealing with low back pain and should therefore be proposed as an alternative to or in association with pharmacological therapies or as a means to complement these.

There is a whole range of exercise opportunities that can be tailored to each individual patient and can allow for proper postural posture to prevent low back pain flare-ups. Let us take, for instance, yoga, Tai chi, stretching, aerobic exercises or physical activity in water. And again, coordination exercises to improve movement can be customized for each patient. In particular of the lower or upper limbs, are also useful for those who regularly engage in sporting activity but, if they perform the athletic exercise incorrectly, they may be exposed to the onset of problems for the spinal column.

Therapeutic exercise is therefore the path we should all pursue to prevent episodes of low back pain and to control episodes of acute low back pain after a few short periods of rest. Exercise should be done up to 2-5 times a week, and therefore very regularly.

The application of surface heat delivery systems can also be a viable solution as it helps to reduce muscle spasm to through a direct action.

Therapeutic heat can have many functions and be effective in many ways for the treatment of muscular and musculoskeletal pain as it helps to reduce muscle spasm through a direct action on pain receptors present at the tissue level (the so-called acceptors) favouring a change in muscle strength by improving perfusion through local vasodilation, hence increasing the supply of oxygen and nutrients, and promoting the removal of all toxic substances resulting for example from overuse exercise. We can associate the therapeutic heat that allows even in conditions of physical exercise the prevention of the onset of muscle spasm, the increase in metabolism and a better perfusion of the entire muscle.

Not to forget, there is cognitive and behavioural treatment, a pivotal aspect in the treatment of low back pain, free of side effects and recommended by all major guidelines. Therefore, associating therapeutic exercise accompanied by a physical therapist with a psychological approach is certainly the best way to intervene both on muscular and biomechanical aspects and on those psychological and social aspects that can contribute to determining states of contracture and pain. The combined cognitive behavioral treatment of exercise is our winning weapon, which in association, when necessary, with rehabilitative pharmacological treatments allows us to prevent recurrences of back pain or chronic pain.