

Effect of Concurrent Co-Morbidity in the Management of Musculoskeletal Disorders

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Abstract

Musculoskeletal disorders exert a substantial impact on the quality of life of affected individuals as well as placing a major economic burden on work organizations and society in terms of compensation costs in the short term and lost wages in the long-term. Musculoskeletal conditions may occur with or without concurrent chronic conditions, which may affect the effectiveness of physiotherapy management. The impact of co-existing co-morbidities other than the primary diseases the patient is being managed for, on the treatment, and on the outcomes of physiotherapy programs for individual patient cannot be over-emphasized. Hence, the purpose of this review was to summarize the management of musculoskeletal disorders and the impact of chronic conditions on their treatment outcome.

Keywords: Musculoskeletal disorder, Comorbidity, Risk factors, Manual therapy, Electrotherapy.

INTRODUCTION

Musculoskeletal disorders are made up of diverse illnesses affecting the bones, joints, muscles, and connective tissues are grouped together as musculoskeletal disorders. These conditions may cause discomfort and function loss.^[1] They are among the most disabling and costly conditions in the United States.^[1] Musculoskeletal disorders are the second most common cause of disability globally, measured by Years Lived with Disability (YLDs), with low back pain being the most frequent condition.^[2]

Disorders of the musculoskeletal system are problems that can be brought on by inherited, congenital, or acquired pathologic processes, according to the Social Security Administration (SSA). Traumatic or developmental events, infectious, inflammatory, or degenerative processes, as well as neoplastic, vascular, or toxic/metabolic illnesses, can all cause impairments.^[3]

Musculoskeletal conditions comprise more than 150 conditions that affect the locomotor system of individuals.^[4] They vary from abrupt, temporary disorders like fractures, sprains, and strains to chronic conditions linked to continuous functional restrictions and disability. Pain (often persistent) and restrictions in mobility, dexterity, and general level of functioning are the typical symptoms of musculoskeletal problems, which make it harder for people to work.^[4]

Epidemiology

Musculoskeletal conditions are also the biggest contributor to Years Lived with Disability (YLDs) worldwide with approximately 149 million YLDS, accounting for 17% of all YLDs worldwide. According to a recent examination of Global Burden of Disease (GBD) data, 1.71 billion individuals worldwide suffer from musculoskeletal disorders.^[5] It affected people of all ages worldwide, but the prevalence of musculoskeletal diseases varies by age and diagnosis. By far the most afflicted nations, according to the WHO,

are those with high incomes (441 million people), followed by those in the WHO Western Pacific Region (427 million people), and the South-East Asia Region (369 million people). Low back pain accounts for the majority of musculoskeletal problems overall.^[5] Fractures, which affect 436 million people worldwide, osteoarthritis, which affects 343 million, other injuries, which affect 305 million, neck pain, which affects 222 million, amputations, which affect 175 million, and rheumatoid arthritis are additional contributors to the overall burden of musculoskeletal conditions (14 million).^[5]

Risk factors for Musculoskeletal Disorders

Numerous factors, including biomechanical, environmental, psychological, and individual risk factors, might contribute to musculoskeletal disorders.^[6] The risk factors for musculoskeletal discomfort are present in almost every industry, including business, agriculture, and the healthcare sector.^[7] A number of factors, in addition to age and sex, have been reported to increase a person's risk of having persistent musculoskeletal pain.^[8] The common risk factors that cause musculoskeletal disorders may include awkward or static posture.^[9] Forceful motion,^[10,11] repetitive motion,^[12] adverse working environment.^[13,14]

However, there is mounting evidence that additional factors, such as psychological problems and mental stress, which have been linked to a common risk factor for musculoskeletal pain, particularly among students with relation to their study, are also present. Also, some psychosocial factors (such as job dissatisfaction, limited job control and limited social support from supervisors or colleagues) within the workplace have been associated with musculoskeletal pain.^[15]

Furthermore, data from community-based studies indicated that specific Personal Attributes (such as height and increased visual demand) are associated with the origin of musculoskeletal pain in some people, however, these may differ from population to population.^[16,17]

Types of Musculoskeletal Disorders

Musculoskeletal disorder can be caused by disorders of bones, joints, muscles, tendons, ligaments, bursae, or a combination.^[18] These can be divided into groups according to the body tissue that is affected, such as bone problems or pain that is typically described as deep, penetrating, or dull. It is most frequently caused by injury, but it can also be brought on by bone infection (osteomyelitis), hormonal issues, tumors,^[19] muscle disorders which is usually characterized as cramping, pressing quality,^[20] tendon and ligament pain disorders are often described as “sharp” and is worse when the affected tendon or ligament is stretched or moved and is usually relieved by rest,^[18] and joint injuries which usually produce a stiff, aching, pain. The discomfort, which can be mild to severe, gets exacerbated as the joint is moved.^[19]

Management of Musculoskeletal Disorders

The use of treatments from one or more clinical disciplines that are included into a comprehensive treatment plan is a multimodal approach to pain management.^[21,22] Strong evidence supports the idea that taking many drugs at once that have diverse mechanisms of action and target different parts of the body results in superior analgesia and fewer adverse effects. The foundation of multimodal analgesia is this.^[17,23]

General practitioners, physiotherapists, chiropractors, and osteopaths provide treatment for musculoskeletal diseases using a variety of techniques. These include both pharmacological and non-pharmacological interventions, such as analgesics, Non-Steroidal Anti-Inflammatory Medicines (NSAIDs), and corticosteroid injections. Examples of non-pharmacological treatments include exercise therapy, self-management counseling and education, and manual therapy.^[24] Pharmacological treatment is often of low value than non-pharmacological intervention when pain is non-specific, chronic or widespread.^[25]

Pharmacological Management of Musculoskeletal Disorders

Analgesics

Musculoskeletal pain is treated using the three-step WHO analgesic ladder (non-opioids, weak opioids, and strong opioids).^[26] Paracetamol and cyclooxygenase inhibitors, such as aspirin and non-steroidal anti-inflammatory medications, are a part of the initial stage (NSAIDs). Due to safety concerns, paracetamol is frequently recommended as the medicine of choice.^[27] When non-opioids have insufficient effect or are poorly tolerated, the next step to consider involves weak opioids, such as tramadol, codeine and dextropropoxyphene. Tramadol is proposed to be the better choice due to its pharmacological profile and effect on pain in several musculoskeletal disorders.^[26,28] When other methods for treating musculoskeletal pain have failed, strong opioids may be explored if they are a part of an ongoing therapy strategy.^[29] They should be used with great care and are seldom beneficial in the long-term treatment of musculoskeletal pain.^[25] Generally, analgesics are beneficial when there is a specific nociceptive component, but often have limited benefit in non-specific or persistent broad pain.^[26,30]

Antidepressants

Tricyclic Antidepressants (TCA), especially amitriptyline, have been found to be useful in the treatment of neuropathic pain^[31] and also useful for patients with chronic musculoskeletal pain problems, such as fibromyalgia and low back pain.^[32]

Anticonvulsants

Anticonvulsants such as carbamazepin, phenytoin, gabapentin and pregabalin also have a long therapeutic tradition in the treatment of specific neuropathic conditions.^[33,34] Such particular conditions (such as trigeminal neuralgia, diabetic neuropathy, and post-herpetic neuropathy) may play a significant role in a chronic pain issue that is believed to originate from the musculoskeletal system.^[32]

Non-Pharmacological Management of Musculoskeletal Pain

Physical therapy and patient education using a cognitive approach are the cornerstones of non-pharmacological treatment, and they are best administered together as part of a multi-professional rehabilitation program.^[35]

Therapeutic exercise

Physical therapy manages musculoskeletal pain in large part through exercise. Exercise can take many forms, including walking, running, aerobic activity, weight training, isometric exercises, mobility drills, and activities that encourage the activation and reeducation of particular muscle groups.^[25,36] Exercise can be very helpful in preventing and treating pain of musculoskeletal causes.^[36] In all exercise interventions, there is a need for strategies to ensure adherence and compliance with the exercise regimen.^[25]

Physical modalities

These modalities could be helpful and effective in treating both acute and persistent pain. Pain is typically induced by muscle spasm, which is reduced by applying heat or cold. Direct muscular damage or underlying primary neurologic or skeletal disease may also be the cause of spasmodic muscle shortening.

Passive treatment programs such as hot packs, massage, and ultrasound may be appropriate for a short period; however, a home exercise program, stretching, and self-applied modalities should be implemented early.^[37] There are no large landmark clinical trials of these modalities, so evidence must be considered as limited.

Cryotherapy

Direct application of therapeutic cold to an injured location reduces bleeding and vasodilation, as well as the local inflammatory reaction, edema generation, and pain perception. For both acute sports-related injuries and long-term painful conditions, the PRICE (protection, rest, ice, compression, and elevation) technique is frequently advised. In patients with peripheral vascular disorders, such as Raynaud's disease, cryotherapy is not advised. The ulnar and peroneal nerves in the medial elbow and head of the fibula, for example, should not be exposed to an extreme low temperature for an extended period.^[37]

Heat therapy

Heat therapy has been proven to be useful in treating subacute and chronic pain disorders by increasing collagen extensibility, blood flow, metabolic rate, and inflammation resolution. Other advantages of heat therapy include reduced pain, muscular spasms, and joint stiffness. Heat increases the pain threshold and reduces spindle excitability by directly affecting it. In order to

relieve musculoskeletal contractures, joint stiffness, and chronic inflammatory illnesses, therapeutic heat application is used in conjunction with extended stretching. This results in decreased discomfort and increased range of motion and function.^[38]

Superficial heat therapy is contraindicated in cases with sensory impairment, vascular insufficiency, malignancy and infection, while deep heat is contraindicated in pregnancy, sensory deficit, and metal implants.^[39]

Electrotherapy

Electrotherapy modalities (also known as electrophysical agents) are methods of physical therapy that aim to reduce pain and improve function via an increase in energy (electrical, sound, thermal or light) into the body.^[40] Examples include therapeutic ultrasound, Transcutaneous Electrical Nerve Stimulation (TENS) and interferential therapy. TENS is one of the most commonly used and has been in use since the 1960s.^[41] The gate control theory of pain, developed by Melzack and Wall, is the foundation for TENS, according to which the preferential activation of big A-fibers prevents the passage of painful impulses.^[37] It has been utilized to treat both acute and persistent pain, including postoperative pain, complicated regional pain syndrome, phantom limb pain, and peripheral nerve discomfort.

It is contraindicated in patients with a cardiac pacemaker injury.^[42] TENS has been used anecdotally for low back pain, but studies show conflicting recommendations on the matter. TENS has been shown to be effective in osteoarthritic and neuropathic pain.^[43]

Manual therapy

Manual therapy, including mobilisation, manipulation and massage, can be beneficial in reducing pain and improving function.^[44] Massage has been found to be effective in the management of chronic low back pain, but spinal manipulations have shown only small benefits.^[44,45]

Impact of chronic conditions on the management of musculoskeletal disorders

Almost all countries today attribute chronic diseases and non-communicable diseases as the leading cause of adult mortality, and in the coming ten years, that number is expected to rise by 17%.^[46] Globally, approximately one in three of all adults suffer from multiple chronic conditions.^[47]

A chronic condition is a human health condition or disease that is persistent or otherwise long-lasting in its effects or a disease that comes with time.^[48] They could last for three months or more and cannot be prevented by vaccines or cured by medication nor will they disappear.^[49] Chronic diseases according to Wilper *et al.* (2008)^[50] include cancer, Chronic Obstructive Pulmonary Disease (COPD), diabetes mellitus, hypercholesterolemia, asthma, and cardiovascular disease. Chronic Musculoskeletal Conditions (CMCs), which can be brought on by the actual labor or by the workplace environment, gradually worsen over time and have an adverse effect on an individual's functional capacity and quality of life.^[51,52]

The effect of coexisting comorbidities, distinct from the underlying disease for which patients are being treated (the "index disease"), on the management and results of physiotherapy programs for specific patients, has come to be more widely acknowledged in recent years. However, the treatment of patients with comorbidities in daily practice is still unclear and dependent on the therapist's training and expertise.^[53]

Comorbidity (such as diabetes mellitus), which adversely impacts the treatment outcomes of the index disease (such as COPD or rheumatoid arthritis), or treatment for one condition, may necessitate adjustments in intervention tactics (e.g., cardiopulmonary endurance training).^[53]

Physical and occupational therapists must identify comorbidities in order to apply suitable methods aimed at reducing the effects of the comorbidity and establish a reasonable prognosis for their patients.^[54]

Furthermore, comorbidity may negatively interact with the treatment or natural course of a coexisting disease (e.g., severe osteoarthritis of the knee).^[53] Therefore, understanding the factors to take into account while using physical therapy on comorbid patients as well as ideas to improve and hasten clinical reasoning may be helpful for healthcare providers in achieving the best possible results.^[53]

CONCLUSION

The hallmark of musculoskeletal disorder is a pain, discomfort and often disability. Some of these conditions may occur simultaneously with background of co-morbid conditions such as hypertension and diabetes etc., and physiotherapy has long been central to the clinical management of people with musculoskeletal disorders. Although, some authors find that physiotherapy management should consider the co-morbid conditions the patient being managed as it may affect the mode of intervention used and in the long run may have an effect on the level of the recovery of the patient.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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