

Ameliorating Physiotherapists Rehabilitation by Studying Trigger Point Pseudo Weakness

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Received: March 18, 2020; **Published:** May 29, 2020

Abstract

Physiotherapists rehabilitate with movement, intending to recover the function and quality of life of the patients. It is essential to know the musculoskeletal system. The muscular system is composed of several muscles with respective origins, insertions and function directly dependent on the kinetic chain, and muscular type. Muscles are affected by trigger points, one of the leading causes of myofascial pain, and disability. Trigger points also cause pseudo weakness that can and will be a negative impact on the rehabilitation program. In this paper, we show the importance of proper evaluation and why the physiotherapist should be closely alert to the pseudo weakness condition, never neglecting it, and aiming to improve the rehabilitation program.

Keywords: *Physiotherapists Rehabilitation; Pseudo Weakness*

Introduction

The muscular system is composed of several muscles, at least 212 listed muscles with respective origins, insertions, innervation, and function [7].

Understanding the origin, insertion and muscular fiber orientation will provide knowledge about the muscular function, in many ways. It will depend on the open or closed kinetic chain and the context of the movement. The muscle action can be from origin to insertion or insertion to origin.

In an example, the iliopsoas muscle in the open kinetic chain will move the lower limb in tight flexion movement, but when it is in the closed kinetic chain will move the trunk in flexion movement [3].

The musculoskeletal system is responsible for providing independence and functionality, from primary locomotor function to specific and intricate activities.

As every human has the musculoskeletal system, all of us are subject to muscular trigger points, described as a tense, hyperirritable point in a muscular taut band. Estimate that 85% of people worldwide will experience myofascial pain and 30% to 85% of patients with musculoskeletal pain suffer from this condition [2,4].

The muscular trigger point can also cause a pseudo weakness dysfunction, which will inhibit muscular activation and therefore prejudice functionality and quality of life.

The movement system is defined by the 2013 House of Delegates American Physical Therapy Association, the core of physical therapy professional identity [1]. Therefore, the importance of knowledge about the complex of myofascial pain, trigger points, and pseudo weakness.

Objective of the Study

The objective of this article is to provide transparent information about the pseudo weakness caused by muscular trigger points and how it can affect the physical rehabilitation program.

Discussion

Muscular mobilization and stabilization

It is not possible to perform a clinical muscle exam or test without knowing the primary muscle function.

First, muscles can be classified by their function; it can be mobilizer or stabilizer.

The muscles that mobilize structures are normally bi or multi articular, superficial, have great levers, and the lever mechanics favor speed and range of movement [6].

In an example: Hamstrings, Rectus Abdominis and Brachial Biceps.

The muscles that stabilizes structures are normally mono-articular, superficial (distribution of force and load by aponeurosis) or deep (short levers).

In an example: Minimum Gluteus, Coracobrachialis and Psoas.

Muscular kinetic chain

It can be an open or closed kinetic chain, and it will directly influence the muscle action.

To differentiate the kinetic chain and understand the muscle action, the clinician should understand the movement. What is the fixed point (in this case origin), what is the moving point (in this case insertion)? Supposing that the muscle activation is from origin to insertion and the insertion point will move in the direction of origin point, and then know what the muscle action is.

In an example, the square lumbar muscle (origin: 12th rib and transverse process from 1st to fourth lumbar vertebrae; Insertion: Iliac crest and iliolumbar ligament; action: movement of pelvis or trunk).

It will move the origin point or the insertion point, depending on the fixed and moving point.

If the moving point is the origin, and the lower limb is fixed (i.e. orthostatic), the function is trunk inclination (unilateral muscle activation), and trunk extension (bilateral muscle activation).

If the moving point is the insertion, and the lower limb is not fixed (i.e. Trendelenburg position, the lower limb without support), the function is a pelvic lift (unilateral muscle activation).

See figure 1 for visualization.



Figure 1: Square Lumbar Muscle Unilateral Activation (closed kinetic chain), Square Lumbar Muscle Bilateral Activation (closed kinetic chain), Square Lumbar Muscle Unilateral Activation (open kinetic chain) - left to right.

Musculoskeletal disorders and trigger points

Musculoskeletal disorders constitute a significant cause of disability and morbidity globally. Musculoskeletal disorders have a broad differential diagnosis and also more diverse presentations. Many functional diseases can also present with physical symptoms leading to delay in diagnosis or misdiagnosis. Therefore clinicians should have clear and comprehensive knowledge about the musculoskeletal examination. The musculoskeletal exam helps to identify the functional anatomy associated with clinical conditions, thereby differentiating the underlying system involved and could correctly point towards the condition helping in early diagnosis and intervention. Early intervention is essential in the treatment effectiveness of chronic musculoskeletal medical conditions and thus preventing unnecessary costs for the health and social care systems [10].

It is estimated that 85% of people worldwide will experience myofascial pain, and 30% to 85% of the people that already experience this condition suffers from the Trigger Point mechanism [9].

The Trigger Point is a rigid, hypersensitive, and painful spot in a muscular taut band, which causes referred pain, movement limitation, and disability, which will affect the individual quality of life [2].

The exact mechanism of trigger points is not clear, but there are correlations between increased local acetylcholine (ACh) and fascial changes in the muscular fascia.

To be sure that the patient suffers from myofascial trigger points, six characteristics need to be examined (adapted from Bennet R, 2007 [2]):

1. Focal point of muscular tenderness
2. Reproduction of pain by trigger point palpation (max. 3 kg pressure)
3. Taut band
4. Restricted range of movement
5. Pseudo weakness without atrophy
6. Referred pain on continued pressure (over 5 seconds).

Usually, the examination is focused on trigger point pain and referred pain, but for physiotherapists, it is not the only issue to concern. As the physiotherapist rehabilitate with movement, the clinical evaluation should highlight dysfunctions that do not incapacitate (i.e. pain) but alters functions (i.e. proprioception dysfunction and pseudo weakness caused by trigger points) [2,5,8].

Muscular pseudo weakness

The pseudo weakness, caused by a trigger point, is a deficit of muscular strength and consequently, a deficit in the range of movement (ROM, without muscular atrophy).

The limited ROM is not related to pain and not related to atrophy but is very common in daily clinics.

To properly evaluate this condition, the patient should perform the muscular action (i.e. deltoid and shoulder abduction; rectus abdominis and trunk flexion; gluteus maximus and thigh extension) with both sides. The affected side will present no pain and a limited range of movement and the not affected side will present no pain and normal range of movement.

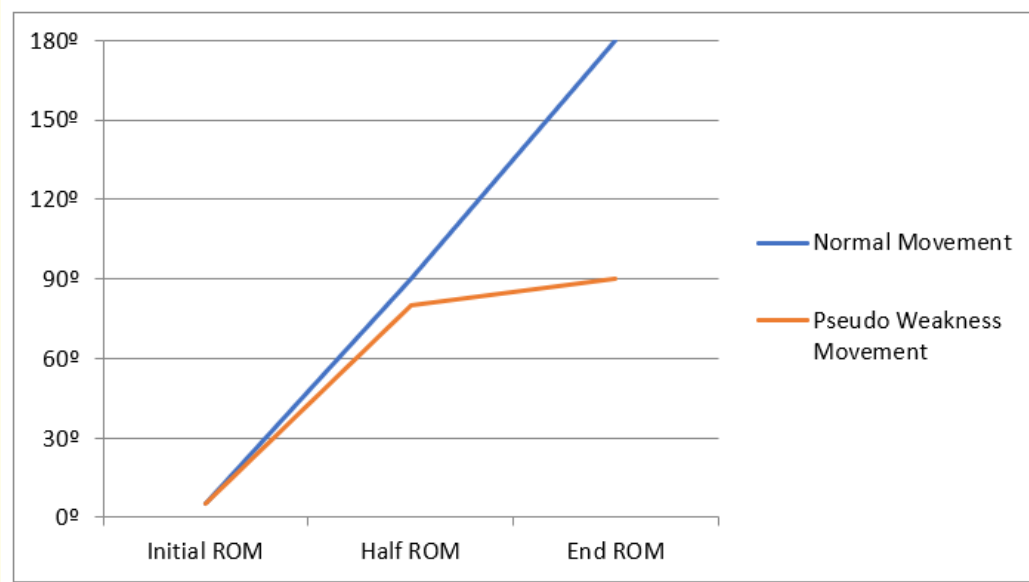


Figure 2: 0 to 180 degrees ROM, difference between normal and pseudo weakness movement.

Case example



Figure 3: 0 to 180 degrees ROM in a real case post-surgery patient with infrascapularis muscle Trigger Point.



Figure 4: 0 to 180 degrees ROM in a real case post-surgery patient with infrascapularis muscle Trigger Point after treatment with CT Manipulation Technique.

This case report (patient passed through a shoulder tendon reconstruction surgery, and had no limitation by pain, only weakness) shows how the pseudo weakness can be a challenge and impair the rehabilitation program.

With the therapy, the Trigger Point (See figure 5) was inactive and therefore the patient could perform and evolve in the functional and movement rehabilitation.

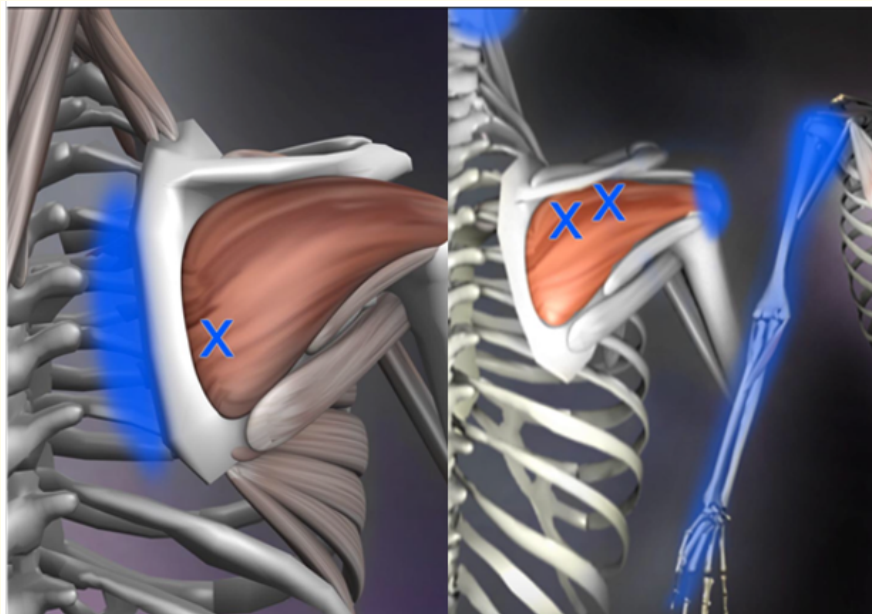


Figure 5: Infraspinatus Trigger Point (X) and points of referred pain or weakness (blue brush).

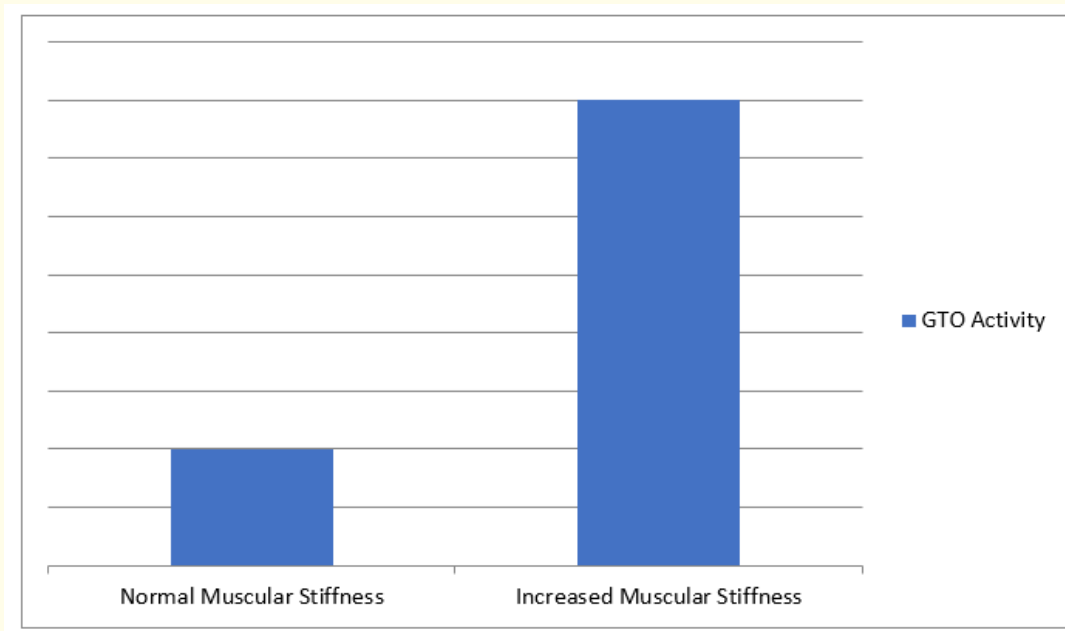


Figure 6: GTO Activity, difference between normal and increased muscular stiffness.

Proprioception dysfunction

Frequently patients complain about movement distortion, a sudden weakness that “loosens” the movement.

The first hypothesis is a ligament injury. After the clinical exam, and if necessary, the imaging exam, a ligament injury can be discarded or evidenced. When the first hypothesis is discarded, the clinician can suspect of proprioception dysfunction, caused by a trigger point.

The muscular trigger point causes muscle stiffness and alters the elastic capacity of the muscle. This dysfunction can cause increased traction at the tendon and promote a spontaneous activity of the Golgi tendon organ (GTO) that will reflex as a sudden weakness.

Conclusion

The primary physiotherapist’s goal should be the recovery of functionality and improvement of the patient’s quality of life.

In the musculoskeletal rehabilitation, muscular trigger points are often examined and treated with the focus on the pain. However, the pain is not the only challenge to deal with as the pseudo weakness and proprioception dysfunction caused by the same pain trigger point can impair the rehabilitation program.

This article presents new clinical reasoning for physiotherapists, with a focus on functionality, not on pain. The ideas of this article may help physiotherapists to enlighten the lack of clinical reasoning and clinical practice, just as the results of the rehabilitation program.

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Volume 3 Issue 6 June 2020

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