REVIEW ARTICLE

CONTENTS

Iliotibial band and lumbar spine pain – a hidden connection

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ABSTRACT

The iliotibial band (Latin: *tractus iliotibialis*; ITB) is most commonly associated with patellofemoral pain syndrome, also referred to as runner's knee. However, the impact of its imbalance on the lumbar spine is substantial and frequently overlooked. As a significant thickening of the fascia lata, the iliotibial band serves as a crucial component for the lateral stabilization of the entire kinematic chain of the lower extremity and the pelvis. Restricted tissue gliding, gluteus medius insufficiency and weakness of the core musculature may present as primary contributors to pain syndromes manifesting in the lumbar region of the spine. This article highlights the relationship between the dysfunction of the iliotibial band and chronic lumbar spine pain to propose a comprehensive rehabilitation approach. This approach should include soft tissue relaxation techniques, loading of muscle structures, and correction of movement patterns. The attention given to the flexibility of the iliotibial band allows for a substantial reduction in the pain of the sacroiliac region.

KEY WORDS: rehabilitation, treatment, kinesio tape

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INTRODUCTION

Pain in the lumbar spine is affecting more and more people. The problem affects not only athletes due to repetitive movements and overexertion [1]. Most people with sedentary lifestyles, including disabled people who spend a lot of time in wheelchairs, complain of discomfort in the lumbar spine. The increasing number of women reporting chronic back pain during pregnancy, postpartum, and in the period following delivery is expanding the group of patients with lumbosacral pain. These complaints become chronic.

The causes vary greatly, ranging from insufficient physical activity to an ill-chosen training plan. The result is poor biomechanics of the entire body.

Patients are characterized by muscle imbalance. The symptom is hypotonia of the abdominal muscles with simultaneous resting hypertonia of the muscles: iliopsoas, quadratus lumborum, gluteus maximus, tensor fascia lata, and vastus lateralis.

AIM

The aim of the current article is to highlight the often-overlooked relationship between iliotibial band (ITB) dysfunction and chronic lumbar spine pain, and to propose a comprehensive rehabilitation approach that integrates assessment of the ITB, targeted manualtherapy techniques, and progressive core stabilization exercises to alleviate lowback discomfort and improve overall pelviclumbar biomechanics.

MATERIALS AND METHODS

In order to develop a comprehensive therapeutic model, the following research and clinical methods were utilized:

1. Literature Review: A systematic search of electronic databases (PubMed, Google Scholar, Scopus) was conducted to identify biomechanical correlations between the iliotibial band (ITB) and the lumbopelvic complex;
2. Clinical Diagnostic Tests: The model incorporates the use of the Ober test for the clinical assessment of ITB tension and flexibility;
3. Physiotherapeutic Procedures: The efficacy of the following manual therapy techniques was analyzed:
   - o Deep Tissue Massage and "Pin & Stretch": Aimed at improving myofascial gliding and reducing tissue adhesions;

- Post-Isometric Relaxation (PIR): Utilized to normalize the muscle tone of the lumbopelvic structures;
- Trigger Point Therapy: Targeted at eliminating referred pain patterns within the kinetic chain.

4. Supplementary Methods: The analysis included the application of kinesiotaping for structural support and biofeedback training to enhance motor control and postural self-correction.

REVIEW AND DISCUSSION

The iliotibial band is located on the lateral side of the thigh. It consists of longitudinally arranged fascial connective tissue. It is formed by the connection of tendinous tissue fibers with the tensor fascia lata muscle at the front, centrally in the extension of the thick, tendinous fascia of the gluteus medius, and with the fibers of the gluteus maximus muscle at the back [2].

The proximal part is divided into three layers:

–superficial – from the anterior superior iliac spine to the fascia lata;

–intermediate – from the ilium to the tensor fascia lata muscle;

–deep – the supracondylar fossa.

All layers connect at the distal end (tensor fascia lata tendon) and pass through the greater trochanter without attachment. The distal course is firmly attached to the linea aspera of the femur via the lateral intermuscular septum.

The iliotibial band ends by attaching to the lateral condyle of the femur, the lateral retinaculum of the patella, and the anterolateral side of the tibial condyle (Gerdy's tubercle) [2, 3].

The ITB is composed of fibrous connective tissue. It exhibits significant mechanical integrity and plays a key role in the transmission of tension in the musculoskeletal system. It is characterized by a high potential for structural adaptation in response to progressive mechanical and functional loads.

The fascia does not have its own motor innervation but is closely connected to the nerves supplying the muscles:

–tensor fascia lata – superior gluteal nerve (L4 – S1);

–gluteus maximus muscle – inferior gluteal nerve (L5 – S2) [4].

The most common dysfunction is iliotibial band syndrome (ITBS). It causes pain on the outside of the knee. It mainly affects athletes and people with mobility issues.

Those most at risk of strain injuries are people who lead a sedentary lifestyle, women who have been pregnant, and people who perform physical work involving repetitive movements (lifting and passing weights to one side).

The most common symptoms are:

–dull pain in the lower back, worsening in the evening;

–feeling of stiffness in the hip, radiating to the lumbar spine;

–pain in the lumbar spine radiating to the side of the thigh, confused with sciatica, without neurological symptoms;

–stiffness in the lateral part of the thigh;

–increased tension in the quadratus lumborum, gluteus maximus, and hip flexors;

–weakness of the gluteus medius muscle (responsible for stabilizing the pelvis during walking);

–pain in the lumbosacral region (mistakenly diagnosed as a disc problem).

Reduced gluteus medius muscle function causes a deficit in dynamic pelvic stabilization. The compensatory mechanism is excessive activity of the tensor fascia lata (TFL) and gluteus maximus (GLUT MAX) muscles. This causes a chronic increase in ITB tone, especially in the central and posterior parts [5].

The mechanism most commonly found in women who were in advanced pregnancy involves a decrease in the muscle tone of the abdominal press. The result is a lack of control over pelvic mobility. Anterior pelvic tilt, increased lumbar lordosis, excessive activation of the hip flexor muscles, and hyperactivity of the tensor fascia lata muscle (which transfers tension to the iliotibial band) [6]. When unilateral tension occurs, the pelvis becomes tilted, resulting in functional shortening of the lower limb and lateral curvature of the spine.

REHABILITATION

Patients presenting with lumbar spine pain often undergo local rehabilitation in the area where the pain occurs. It is worth paying attention to the iliotibial band even if the Ober test is negative. The tissue of the band is very susceptible to mechanical overload. Myofascial stiffness tends to compress deep structures. The priority in the initial stage of improvement is to separate the iliotibial band from the hamstrings and quadriceps, which often pull the band backward or forward.

When the patient is lying on their healthy side, the hip and knee joints remain bent at approximately 40 degrees. The therapist places their hands on the side of the thigh, palpating the ITB.

PIN & STRETCH TECHNIQUE

Hook the band and gently stretch it, looking for the direction of tension: up and down and sideways until we achieve smooth tissue gliding.

Fig. 1. Skin rolling technique of the ITB
Source: Own materials

In order to increase tissue flexibility, soft tissue mobilization is performed using the skin fold rolling method. The technique is performed by grasping the fold, starting from the distal segments (lateral femoral epicondyle area), maintaining constant tissue traction, in the proximal direction (up to the level of the anterior iliac spine). The therapist works on all parts of the anterior, central, and posterior ITB. The goal is to achieve smooth tissue gliding and reduce interfascial adhesions (Fig. 1) [7].

After initial superficial treatment, we move on to targeted neuromuscular therapy of deeper structures. We use deep transverse massage along the entire length of the iliotibial band, perpendicular to the direction of the fibers (Fig. 2).

Continuing therapy in the proximal direction, we focus on the gluteus maximus muscle and the tensor fascia lata muscle. The goal is to normalize the muscle tone of the structures that tighten the ITB (Fig. 3, 4) [7,8].

In the chronic phase, an important treatment is Trigger Point Therapy, which often targets the vastus lateralis, tensor fascia lata, and gluteus maximus muscles. The presence of active trigger points in these areas often induces referred pain that mimics or exacerbates ITB symptoms.

Fig. 2. Deep transverse massage of the ITB
Source: Own materials

Ischemic compression – involves applying strong pressure to a point, e.g., with a thumb or elbow. Positional relaxation – positioning the patient's body in a position where the pain disappears.

Self-treatment – using balls, e.g., tennis balls, and rollers.

This therapy is often painful for the patient, but it brings immediate relief [9]. A key element of the therapy is the normalization of tension in the sciatic-shin group and gluteal muscles using the Post-Isometric Relaxation (PIR) method. The technique utilizes the phenomenon of autogenic inhibition, which allows for the safe elongation of muscle-fascial structures (Fig. 5, 6).

In women who have given birth by caesarean section, the scar should be examined to check its tenderness and mobility. Most women avoid pain by walking in a bent position. Scar therapy is a key element in returning to full fitness. We begin mobilization with stroking and gentle planar sliding, then use gentle movements to traction the scar from the fascia. When working with scars, rehabilitation may be longer and more laborious

Fig, 3. Manual rolling of the TFL
Source: Own materials

Fig. 4. Deep manual therapy of the TFL
Source: Own materials

Fig, 5. PIR of the gluteal muscles
Source: Own materials

Fig. 6. PIR of the sciatic-shin group
Source: Own materials

Fig. 7. Kinesiotaping of the ITB
Source: Own materials

in the later stages. Many physical therapists also perform Dry Needling therapy. Kinesiotaping is used as a supportive therapy method (Fig. 7)

After completing manual therapy and myofascial release, core stabilization training is essential. Its purpose is to strengthen the lumbar-pelvic-hip complex (LPHC). Particular emphasis is placed on activating the rectus abdominis, oblique muscles, transverse abdominis, and gluteus medius muscles in order to improve the efficiency of the deep stabilizers of the torso [9].

Due to advanced structural and muscular imbalance, we begin the rehabilitation process with static muscle activation.

EXAMPLE EXERCISE FOR THE RECTUS ABDOMINIS MUSCLE

Starting position – lying on your back, lower limbs bent at the hip and knee joints, feet stabilized.

The patient performs an isometric contraction of the rectus abdominis muscle, which involves applying axial pressure with the hands to the surface of the thighs while reducing the lordosis of the lumbar spine.

Next, we activate the remaining muscle groups involved in core stabilization.

The next phase of rehabilitation involves introducing exercises of increased intensity and fewer points of support, while maintaining stabilization of the lumbar spine through even tension of the abdominal and gluteal muscles.

An important form of improvement is working with biofeedback, which allows the patient to continuously self-correct their pelvic alignment [10].

The recommendation for the patient for subsequent home rehabilitation is to perform the following exercises after learning them with a therapist:

–rolling the iliotibial band and the front of the thigh,
–stretching the gluteus maximus and hamstrings,
–strengthening the lumbar-pelvic-hip complex.

The patient should pay attention to the quality of movement and stabilization of the muscle corset.

CONCLUSIONS

It is worth checking the iliotibial band not only in known cases such as ITBS (causing pain in the outer part of the knee joint), but also in chronic lumbar spine pain.

Effective rehabilitation should be comprehensive. It should include soft tissue relaxation techniques (an important component), progressive loading of muscle structures (a key element of therapy), and correction of movement patterns.

Attention to the flexibility and proper function of the iliotibial band leads to a significant reduction in pain in the sacroiliac region.

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CONFLICT OF INTEREST

The Authors declare no conflict of interest

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