

Myofascial Pain and Photobiomodulation

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Abstract

The pelvic floor consists of muscles, ligaments and fascia that extend from the urethral opening to the anus that support important organs like bladder, uterus and bowel. Muscle dysfunction can cause pain in the pelvis, hips, and lower back. The diagnosis of chronic pelvic pain is made after three to six months of pelvic pain and is often based on history or physical; finding the cause of chronic pelvic pain can take time and sometimes a clear reason for the pain may never be found or can be associated with sexual, intestinal, or urinary dysfunctions. Almost 80% percent of patients with chronic pelvic pain (CPP) exhibit dysfunction in the pelvic floor musculature and ninety-nine percent of all cases of chronic pelvic pain are in females [4].

Treatment/Management: Treatment involves a multidisciplinary approach, utilizing medications, physical therapy and pain education. Physical therapy focuses on the rehabilitation and functionality of the pelvic floor musculature, and we are also adjunct, non-pharmacological treatment should also be offered. Transvaginal PBM can provide as a resource to improve blood supply, collagen synthesis, oxygenation, inflammation reduction and analgesia.

Keywords: Pelvic Physiotherapy; Myofascial Pain; Chronic Pelvic Pain; Photobiomodulation

Introduction

Pelvic floor anatomy

The pelvic floor is composed of muscles, ligaments and fascia that extend from the urethral opening to the anus. It serves the function of supporting the pelvic and abdominal organs. The integrity of these structures is responsible for maintaining urinary and fecal continence and preventing pelvic organ prolapse, particularly in the presence of increased intra-abdominal pressure. It also functions as support during pregnancy and childbirth, contributes to sexuality, and stabilizes the pelvis during walking. The pelvic muscles, together with the tendinous arch, endopelvic fascia, and urethra, are responsible for the proper positioning of the pelvic organs, providing support and continence [3].

Pelvic floor muscle dysfunction is associated with the development of lower back, pelvic, and/or hip pain. The pelvic floor musculature is composed of:

- 70% type I fibers: Red, slow-twitch: These provide antigravity action, maintaining constant tone and continence at rest. They support tension over long periods and, with passive support from fascia and ligaments, sustain the pelvic organs.
- 30% type II fibers: White, fast-twitch: These are responsible for muscle contraction in response to increased intra-abdominal pressure, necessary to quickly close excretory tubes, contributing to urinary and fecal continence. Contractions by these fibers are 20% stronger than those of type I but are less resistant to fatigue and more susceptible to injuries from stretching and denervation.

Evaluation

Chronic pelvic pain (CPP) can be associated with sexual, intestinal or lower urinary tract problems and can present myofascial dysfunctions, as well as other conditions such as interstitial cystitis/bladder pain syndrome, irritable bowel syndrome, vulvodynia and endometriosis [1].

Among the problems related to increased muscle tone in the pelvic floor, we should consider:

- Myofascial pelvic pain: Chronic pain resulting from excessive tension in the pelvic floor muscles.
- Vaginismus: Involuntary and uncontrolled spasms of the muscles around the vagina that occur with penetration.
- Dyspareunia: Pain during vaginal penetration during sexual intercourse.
- Vulvodynia: Pain and discomfort in the vulva, often referred from tense and dysfunctional floor muscles.

Some causes of pelvic pain, such as painful bladder syndrome and myofascial pain, can be diagnosed solely through clinical history and physical examination, identifying trigger points, as these diagnoses do not appear in imaging tests.

Types of myofascial pain

- Shortening and muscle sensitivity.
- Tension/increased muscle tone: When the muscle has increased tone, the patient experiences pain when trying to relax or stretch the muscle. Therefore, problems related to increased muscle tone in the pelvic floor tend to cause pelvic pain, muscle spasms, and pain during sexual intercourse.
- Trigger points: Myofascial trigger points generate a heavy or burning pain in the vagina, vulva, perineum, rectum and bladder. They can usually be associated with irritative symptoms such as urinary urgency, frequency, vulvar or vaginal burning, itching or dysuria (pain during urination). Constipation and dyspareunia (pain during sexual intercourse) are also reported. The etiology and risk factors are not completely understood. Women who develop chronic pelvic pain syndrome (CPPS) likely have triggers such as stress, physical trauma, or other painful events, such as urinary tract infection.

Pelvic physiotherapy

Treatment plans typically include pain education, physical therapy, pharmacotherapy and psychological counseling, and require at least three months. Generally, patients begin with pelvic floor physiotherapy from a specialized physiotherapist to address the painful musculature through myofascial release, stretching and strengthening.

Materials and Methods

To conduct this narrative review, we searched for studies addressing the use of photobiomodulation in the treatment of myofascial pelvic pain. The following descriptors were used: "photobiomodulation", "low-level laser therapy", and "pelvic pain".

Photobiomodulation

Photobiomodulation, previously known as low-level laser therapy (LLLT) power, usually below 500 mW depending on the target tissue, is an infrared light that targets the mitochondrial chromophore to increase ATP production and release nitric oxide, which has a vasodilatory effect, improving blood supply to the muscles with intracellular reactions that results in increased cell proliferation, neovascularization by promoting collagen synthesis that aids in healing, improved oxygenation, reduced inflammation, edema, analgesia and muscle relaxation [1].

Parameters of PBM

Low level light therapy refers to the use of red or infrared light, which can be either a continuous wave or pulsed light with relatively low density (0.04 to 50 J cm⁻²) but the output power ranges from 1 mW up to 500 mW in order not to allow thermal effects. The wavelengths range from 600 to 700 nm and 780 to 1100 nm, and they typically have an irradiance or power density between 5 mW cm⁻² to 5 W cm⁻² [5].

The study of Zipper, *et al.* 2021; aimed to evaluate the effect of photobiomodulation on pain relief in women with chronic pelvic pain. A power dosage of 5 - 8W was used for a total of 3,000 to 3,500 joules. The laser application was performed for 2 consecutive days and then biweekly for a total of 9 sessions. Photobiomodulation significantly reduced pain, and its effect was maintained for 6 months.

On the other hand, the observational study of Charles W and Georgine L (2022); aimed to obtain data on the effect of treatment while assessing the overall change in pelvic pain compared to pain levels after 8 treatments. The device used consisted of a 15W diode laser that emits wavelengths of 810 and 980nm through a sterile vaginal probe. The indication for treatment was chronic pelvic pain, and the presence of pelvic muscle sensitivity was confirmed by digital palpation. After treatment, the percentage of patients reporting moderate or severe pelvic pain decreased from 83% to 38% and dysuria decreased from 67% to 27%. Clinically, this was considered a significant change, as patients who completed the treatment had nearly a 90% likelihood of pain improvement.

Conclusion

Transvaginal photomodulation can be an option of non-pharmacological treatment for CPP and possibly effective in modal treatment by reducing pelvic pain, dysuria, and dyspareunia. However, despite the positive results, long-term studies and randomized control studies are still needed to determine the duration and efficacy of the therapeutical effect.

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