



Review article

Genitourinary syndrome of menopause and the use of laser therapy

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ABSTRACT

Genitourinary syndrome of menopause is a common condition that left untreated can progress and negatively affect quality of life and sexual function. Laser therapy has a therapeutic role for several gynecologic conditions and most recently has gained interest as a non-hormonal treatment for genitourinary syndrome of menopause (GSM). The laser is well tolerated and may increase thickness of the squamous epithelium and improve vascularity of the vagina. These morphological changes presumably alleviate symptoms of dryness, dyspareunia, and irritation. However, the duration of therapeutic effects and safety of repeated applications at this point is not clear. Further research is needed in the form of controlled studies of the laser and other non-hormonal GSM therapies. The objective of this paper is to review the existing literature describing laser therapy for GSM.

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1. Introduction

Genitourinary syndrome of menopause encompasses a constellation of symptoms related to the decline of circulating ovarian

hormones. The syndrome may be characterized by complaints vaginal dryness, dyspareunia, pain, urinary incontinence, and recurrent urinary tract infections. Genitourinary syndrome of menopause (GSM) replaces the prior term vulvovaginal atrophy as agreed upon by the joint terminology conference sponsored by the North American Menopause Society (NAMS) and the International Society for the Study of Women's Sexual Health (ISSWSH) [1]. Since the average age of menopause 51 years and the population is aging, with projected life expectancy of 81 years by 2050, more women will be presenting to their clinician with GSM [2]. As well, because of this

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increased life expectancy, many women will live 40% of their lives after menopause with these associated symptoms.

Several therapeutic options are available to alleviate GSM symptoms, including hormonal and non-hormonal products. Most recently, fractionated laser therapy using the principles of regenerative medicine, has been introduced as another management option. This paper reviews the available data with regards to fractionated laser therapy for treatment of symptoms of GSM. Literature search was performed using PubMed, with key words including genitourinary syndrome, vulvo vaginal atrophy, atrophic vaginitis, postmenopausal symptoms, laser therapy and fractional CO₂ laser treatment. All publications reviewed were in English and were published within the last 8 years.

2. Etiology of the symptoms of genitourinary syndrome of menopause

Genitourinary symptoms may cause progressive symptoms in midlife and menopausal women whereas, the vasomotor symptoms usually ameliorate or resolve over time. Several women desire treatment for the bothersome symptoms that are caused by the metabolic and tissue changes associated with the menopausal hormonal changes and aging changes. The most frequent complaints women with GSM present with include vaginal dryness, itching, burning, dysuria and dyspareunia [3]. Consequently, these symptoms, that include diverse clinical symptoms and dermatologic features, account for a decline in the quality of life in 30–50% of aging women [3]. Recurrent infections also are occurring as the result of a decrease in mucosal lactobacilli and an increase in pathogenic bacteria consequent to a decrease in mucosal glycogen delivery triggered by declining ovarian hormonal levels [3].

The symptoms associated with GSM are often underreported by women, under-recognized by health-care providers and, therefore, under-treated [4]. Health-care providers should be proactive in helping their patients discuss this topic in order for the woman to feel comfortable in disclosing her symptoms and to be prescribed adequate education, counseling and treatment [4].

Genitourinary symptoms can be characterized according to the anatomic and physiologic changes that occur. Most of these changes are directly related to the decline in circulating estrogen levels and aging. The vaginal epithelium is a stratified squamous epithelium, which until menopause is moist and thick with rugae [3]. As epithelial cells exfoliate and die, they release glycogen, which is hydrolyzed to glucose that is subsequently transformed to lactic acid by the action of a normal vaginal commensal organism, lactobacillus. At menopause, epithelial thinning with decreased glycogenated superficial cells leads to changes in vaginal flora and a relative loss of lactobacilli, an increased pH, and a change in the microbiome [1]. The changes in vaginal flora that result are an increased growth of pathogenic bacteria such as group B streptococcus, staphylococci, coliforms, and diphtheroids. These organisms in turn, can cause symptomatic vaginal infections and inflammation [3].

High concentration of estrogen receptors in the vagina, vestibule, and trigone of the bladder modulates cellular proliferation and maturation [1]. The decline of circulating estrogen therefore results in reduced collagen content and hyalinization, decreased elastin, thinning of the epithelium, altered appearance and function of smooth muscle cells, increased density of connective tissue, and fewer blood vessels. The anatomic changes include regression and thinning of the labia minora, retraction of the introitus with reduced elasticity, often leading to significant entry dyspareunia. The urethral meatus becomes prominent

relative to the introitus and is vulnerable to physical irritation and trauma. Physiologic changes result in reduced vaginal blood flow, diminished lubrication, decreased flexibility and elasticity of the vaginal vault, and increased vaginal pH [1]. Furthermore, decreases in vaginal tissue strength and increased friability may predispose to epithelial damage with vaginal penetrative sexual activity, leading to vaginal pain, burning, fissuring, irritation, and bleeding after sex [1].

Symptoms related to vaginal atrophy have been reported to affect up to 45% of women. The Vaginal Health: Insight, Views and Attitudes (VIVA) study, surveyed 1578 women with vaginal discomfort. The most prevalent individual symptoms were vaginal dryness (83%) and pain during intercourse (42%). In this same study most women with discomfort (62%) reported the severity as moderate or severe [5]. Despite the high prevalence of such symptoms, only about 25% of affected women seek medical assistance [6]; reasons for not seeking medical help include patient embarrassment and the belief that their symptoms are an inevitable part of aging [5].

GSM also can have significant impact on quality of life. In the Women's Voices in Menopause study, 52% of the respondents reported some degree of negative impact on their quality of life, including negative consequences of their sex life, self-esteem, marriage/relationship and social life [7]. It also has been reported by Levine et al. that sexually active postmenopausal women with sexual dysfunction were four times more likely to have symptoms of vulvovaginal atrophy [8]. Postmenopausal women also report the avoidance of sexual intimacy because they experience pain or the expectation of pain with the onset of symptoms, making the prospect of sex-life with their partner no longer feasible [9].

In regard to postmenopausal breast cancer survivors (BCS), atrophic vaginitis affect nearly 70% of them as compared to 50% of postmenopausal women without breast cancer [10]. GSM symptoms appear to be more common and severe in older breast cancer survivors, especially in those requiring pharmacologic treatment. The majority of women with breast cancer receive systemic pharmacologic treatment consisting of chemotherapy and/or hormonal therapy. These therapies significantly improve clinical outcomes but lead to biological changes that may affect long-term vaginal health and impact quality of life in survivors [10]. Aromatase inhibitors (AIs) are frequently prescribed for postmenopausal breast cancer patients and have become the standard of care because of improved clinical outcomes as compared to Systemic Estrogen Receptor Modulator (SERMS). However, AIs are associated with increased atrophic vaginitis that may compromise compliance with treatment [11].

3. Treatment options for GSM

3.1. Non-hormonal therapy

First-line therapies to alleviate symptoms of GSM include non-hormonal vaginal lubricants and moisturizers as well as regular sexual activity with a partner, a sex device, or masturbation [12]. Vaginal moisturizers are designed to be used on a regular basis to reduce vaginal dryness [13]. Regular use of non-hormonal, long-acting vaginal moisturizing agents can decrease vaginal pH to premenopausal levels, although they do not improve vaginal maturation index (VMI) [12]. Use of lubricants during vaginal intercourse also may reduce friction-related irritation of atrophic tissue. Lubricants, which may be water-based or silicone-based, are intended to be used during sexual activity, and provide temporary relief from vaginal dryness and dyspareunia; however, they have no long-term therapeutic effects.

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