

Vaginal Erbium Laser: the Second Generation Thermotherapy for the Genitourinary Syndrome of Menopause (GSM) in Breast Cancer Survivors. A preliminary report of a pilot study

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ABSTRACT

This is a preliminary report of a pilot study aimed to assess the effectiveness and safety of vaginal erbium laser in the treatment of Genitourinary Syndrome of Menopause (GSM) in postmenopausal breast cancer survivors. GSM symptoms were assessed before and after three applications of erbium laser in 13 women, using subjective (visual analog scale) and objective (Vaginal Health Index Score, VHIS) measures. Vaginal Erbium laser treatment was effective to improve GSM symptoms. Both subjective and objective scores significantly improved in comparison with baseline values ($p < 0.01$). No adverse events were recorded during the study period. This preliminary results suggest that Vaginal Erbium Laser is effective and safe for the treatment of GSM in postmenopausal Breast Cancer Survivors.

Keywords: Menopause, Estrogen, Erbium Laser, Genitourinary Syndrome of Menopause, Breast Cancer Survivors

SOMMARIO

Il lavoro riporta una analisi preliminare di uno studio pilota condotto per valutare efficacia e sicurezza del trattamento con laser Erbium vaginale della sindrome genitourinaria della menopausa (Genitourinary Syndrome of Menopause, GSM) in donne in postmenopausa dopo trattamento per una carcinoma della mammella. I sintomi sono stati valutati in 13 donne, usando scale per la valutazione soggettiva (VAS, visual analog scale) e oggettiva (Vaginal Health Index Score, VHIS). Il trattamento con laser Erbium vaginale è risultato capace di ridurre la sintomatologia della GSM. Sia gli score soggettivi che quelli oggettivi hanno mostrato un significativo miglioramento rispetto ai valori basali ($p < 0.01$). Non sono stati riscontrati eventi avversi durante lo studio. In conclusione, questi risultati preliminari suggeriscono che il con laser erbium possa rappresentare una alternative efficace e sicura per il trattamento della GSM in donne in postmenopausa dopo Carcinoma della Mammella.

INTRODUCTION

The genitourinary syndrome of menopause (GSM) may affect up to 50% of postmenopausal women and their symptoms tend to be progressive, jeopardizing the quality of life and sexual relationships⁽¹⁻³⁾. Local hormone replacement therapy (HRT) is the treatment of choice⁽²⁻⁵⁾. However, many women have contraindications, such as a history of estrogen-dependent tumors, particularly endometrial cancer and breast cancer⁽²⁻⁵⁾. No single agent can globally ameliorate the quality of life of breast cancer survivors, coping with menopausal symptoms. Particularly, specific studies on GSM treatment in breast cancer survivors are scarce. Laser technology is currently widely used with positive effects demonstrated on basic and clinical studies on tissue remodeling, collagenogenesis and angiogenesis⁽⁶⁻⁸⁾. The different types of lasers have different physical

characteristics that determine specific effects on tissues. Recently in a pilot study, Salvatore et al.⁽⁹⁾ demonstrated that treatment with fractionated CO₂ laser induced a significant improvement of the GSM in postmenopausal women. The aim of this study is to evaluate the short-term efficacy and acceptability of a second generation of vaginal laser treatment, using an erbium laser crystal yttrium-aluminum-garnet (Er: YAG) as a non-ablative photothermal therapy for the management of GSM in breast cancer survivors.

MATERIAL AND METHODS

This is a pilot study, conducted in women attending menopause clinic of Pisa University Hospital with an history of treated breast cancer and suffering from GSM. All patients gave written informed consent. The protocol was revised by an National Independent Advisory Board and approved by the Ethics Committee of the Department of Obstetrics and Gynecology. The

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procedures followed were in accordance with the ethical standards of the Committee on Institutional human experimentation, and with the Helsinki Declaration of 1975, as revised in 1983. Inclusion criteria were the presence of GSM in women with plasma levels of gonadotropin and estradiol in postmenopausal range (FSH > 40 U/L; estradiol < 25 pg/ml) and negative PAP smear. Exclusion criteria were: lesions, scars or infection active or recents (30 days) of the genitourinary tract; abnormal uterine bleeding; use of lubricants or any other local preparation within 30 days prior inclusion to study; history of photosensitivity disorder or use of photosensitizing drugs; genital prolapse (grade II-III classification POP-Q); serious or chronic illness that could interfere with the fulfillment of the study; and have been treated with hormones or other medications to relieve menopausal symptoms in the previous 3 months.

In this preliminary report, we show the results of patients suffering from severe GSM after a successful treatment for breast cancer. All patients women were treated with Erbium laser (XS Fotona Smooth™, Fotona, Ljubljana, Slovenia) with a wavelength of 2940 nm. The diameter of the laser spot size was 7 mm, with a pulse according to the SMOOTH™ mode at a frequency of 1.6 Hz, and fluence (laser energy emitted per unit area) of 6.0 J/cm². The procedures were performed on an outpatient basis without anesthesia or drug use before or after the intervention. The treatment protocol consists of 3 laser applications every 30 days (L1, L2, L3) with a visit 2-4 weeks before treatment (V0) and a follow-up visit 4 and 12 weeks after the last application. After treatment, patients are recommended to have sexual abstinence for one week.

Subjective symptoms (vaginal dryness and dyspareunia) were assessed using a visual analogue scale (VAS) at each visit (range 0-10, 0 = total absence of symptom and 10 cm = worst symptom) and the Vaginal Health Index Score (VHIS) was calculated. VHIS evaluates the aspect of the vaginal mucosa (elasticity, pH, vaginal discharge, mucosal integrity and moisture). These parameter were evaluated at baseline (T0), after the first (L1), second (L2) and third (T3) laser treatments, as well as after 4 (T+4) and 12 (T+12) weeks after the last laser treatment. Each parameter is graded from 1 to 5 being atrophic a total score ≤ 15⁽¹⁰⁾. In the post-treatment control, acceptability of therapy was asked, describing it as: excellent, good, fair, bad or unacceptable. Patients who leave the study before the deadline were considered dropouts. This is an interim report,

of an ongoing study the sample size was not based on a statistical rationale. Data are presented as mean and standard deviation. Continuous variables were analyzed using the ANOVA for repeated measures and the Wilcoxon sign-rank test. Data were analyzed using StatView version 2.5 software (SAS Science, Chicago, IL, USA).

RESULTS

Table I show demographic characteristics of patients included in the study.

Table I.
Baseline characteristics of the breast cancer survivors (n=13) included in the study.

	Mean	DS	Min-Max
Age	55.7	7.7	38-68
Age at menopause	47.8	6	31-53
Years since menopause	8.0	5.2	3-15

Vaginal dryness and dyspareunia scores showed a progressive decrease after 1st, 2nd and 3rd treatment (p<0.01, Figure 1). The results were maintained during the follow up, after 4 and 12 weeks from the last laser treatment (p<0.01, Figure 1).

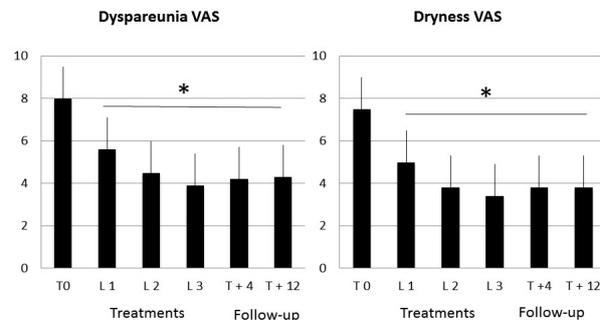


Figure 1.
Effect of second generation laser thermotherapy on Dryness and Dyspareunia scales (10-point scale, cm) in 13 postmenopausal breast cancer survivors (* p< 0.01 vs basal values). See text for details.

Conversely, VHIS values showed a significant increase during the treatment, and the results were maintained after 4 and 12 weeks from the last laser treatment (p<0.01, Figure 2).

No adverse events related to the procedure were recorded throughout the study period. No patients dropped out from the study.

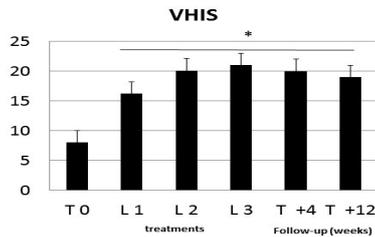


Figure 2. Effect of second generation laser thermotherapy on Vaginal Health Index Score (VHIS) in 13 postmenopausal breast cancer survivors (* $p < 0.01$ vs basal values). See text for details.

DISCUSSION

The analysis of this preliminary study indicates that the second generation vaginal thermotherapy using Erbium laser is effective and safe for the treatment of GSM in postmenopausal breast cancer survivors.

The results obtained in this small series of patients indicate that this method is practical, seems to be well accepted and not related to adverse events. In these particular set of patients the vaginal erbium laser improved the most bothersome symptoms, just after the

first application of laser. Similar results were previously reported in normal postmenopausal women using either the Erbium laser (11), and the CO₂ laser (9). These preliminary, short term results show that treatment with vaginal Erbium laser in breast cancer survivors suffering from severe GSM is feasible, effective and safe in the short term. Further studies are needed to evaluate the effectiveness and the safety of vaginal erbium laser treatment. If these results will be confirmed in properly sized and long-term studies, we will have a safe and effective option to treat GSM in women presenting contraindication to postmenopausal hormone use.

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