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Effects of antioxidant food supplements on postmenopausal women with vaginal dryness.

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ABSTRACT

Objective: To evaluate the effects of antioxidant food supplements on postmenopausal women with vaginal dryness.

Methods: Women with vaginal dryness participated in this pretest–posttest study. The change in the Verbal Rating Scale was used to score vaginal symptoms, nominally vaginal dryness, vaginal irritation/itching, vaginal soreness, and dyspareunia. Color Doppler sonography was performed to measure the peak systolic velocity (PSV) and the end diastolic velocity (EDV) of the clitoral blood flow.

Results: Thirty-four women aged 48–64 years completed the study. At baseline 24.4%, 56.1% and 19.5% of the women rated their vaginal dryness as mild, moderate and severe, respectively. At the 8 week follow-up 14.7% of the women referred to have no dryness (p=0.001), and 58.8% and 26.5% of the women rated their vaginal dryness as mild (p=0.001) and moderate (p=0.01), respectively. The mean PSV improved at the 8 week (1.71±0.7) follow-up compared with baseline values (1.38±0.6) (p=0.03). A similar improvement was observed for EDV [baseline (0.4±0.5) Vs 8 week follow-up (0.7±0.6), p=0.02].

Conclusions: Antioxidant food supplements could be effective in modulating postmenopausal symptoms, particularly vaginal symptoms, and could be well accepted by those women who usually do not wish to use hormone therapy or cannot use it for medical reasons.

Keywords: Antioxidant; Color Doppler sonography; Food supplements; Post-menopause; Vaginal dryness; Verbal Rating Scalet

SOMMARIO

Obiettivo: Lo scopo dello studio è di valutare gli effetti di integratori alimentari con attività antiossidante in donne in postmenopausa con secchezza vaginale.

Metodi: La Verbal Rating Scale è stata usata per definire i cambiamenti dei sintomi vaginali legati alla secchezza. Inoltre, l'ecografia color Doppler è stata utilizzata per misurare i cambiamenti della velocità sistolica (PSV) e diastolica (EDV) dei flussi vascolari clitoridei.

Resulti: 34 donne hanno completato lo studio. Al baseline, 24.4%, 56.1% e 19.5% donne hanno definito la loro secchezza vaginale rispettivamente come leggera, moderata e grave. A 8 settimane di assunzione dell'integratore, il 14.7% delle donne ha riportato nessuna secchezza (p=0.001), e il 58.8% e il 26.5% hanno definito la secchezza rispettivamente come leggera (p=0.001) e moderata (p=0.01). La PSV è migliorata a 8 settimane di assunzione (1.71±0.7) rispetto ai valori pre assunzione (p=0.03). L'EDV ha avuto un simile andamento [baseline (0.4±0.5) Vs 8 settimane (0.7±0.6), p=0.02].

Conclusioni: Gli integratori alimentari con attività antiossidante potrebbero essere efficaci nel modulare i sintomi vaginali della postmenopausa, e potrebbero essere adottati da donne che non desiderano assumere ormoni o che non possono usarli per motivi medici.

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INTRODUCTION

In menopausal women, changes of vaginal well-being are common and usually depend on estrogen deficiency[1,2]. Lack of vaginal lubrication, dryness, burning, irritation and dyspareunia are typical symptoms of post-menopausal women[3]. Dyspareunia and noncoital pain related to these changes are considered the major cause for avoidance of intimacy and loss of libido, with a negative impact on self-esteem and on woman's relationship with her partner[4,5].

Preclinical and clinical research have suggested that the mechanism underling genital sexual response depends on the nitric oxide-cyclic guanosine monophosphate (GMP) pathway. In fact, relaxation of vascular and non-vascular smooth tissue increases pelvic blood flow, vaginal lubrication, and clitoral and labial engorgement [6-8]. In menopausal women, vascular hemodynamic phenomena in the arterial bed supplying female pelvic anatomy can lead to a decrease of vaginal engorgement, causing reduced vaginal lubrication and insufficient clitoral engorgement[9-11].

Recent studies have reported that food supplements have emerged as new interesting compounds for their ability to regulate endothelial function, having antioxidant and vasodilating actions[12,13]. Among these, L-carnitine produces regeneration of Acetyl CoA, preventing the accumulation of oxygen-derived free radicals and therefore exerting a protective action on cardiovascular risk, insulin resistance and diabetes[14,15]. Coenzyme Q10, a fat-soluble substance, is a component of the electron transport chain and participates in aerobic cellular respiration, which generates energy in the form of ATP; 95% of the human body's energy is generated in this way; it is present in all respiring eukaryotic cells, mainly in the mitochondria[16,17]. α-Lipoic Acid (LA) is another substance with an anti-inflammatory, antioxidant, analgesic, and neuroprotective action[18]. It plays a role in cellular energy metabolism and extends an anti-oxidizing activity to free radicals, facilitating pro-inflammatory effects[19]. Moreover, N-acetylcysteine is able to improve total plasma antioxidant status and reduce protein carbonylation[20]. Finally, carotenoid lycopene[21] and the trace minerals zinc[22], manganese[23] and selenium[24] have antioxidant properties.

The present study was designed to analyze the effects of a combined oral preparation containing all the above food supplements on menopausal women with vaginal lubrication disorder

MATERIALS AND METHODS

This pretest–posttest study was performed at the Service for Menopause of the Gynecological Clinic, Department of General Surgery and Medical Surgical Specialties, University of Catania, Italy. The study conformed to the ethical guidelines of the 1975 Helsinki Declaration. Informed written consent was obtained from all the women before entering the study, and they did not receive any monetary payment. The time of enrolment was from March 2018 to September 2018.

Subjects and setting

Women attending the Service for Menopause for counselling because of vaginal menopausal symptoms such as decreased lubrication during sexual activity and genital dryness, irritation/burning/itching of the vulva or vagina, without vasomotor symptoms, and having an interval of amenorrhea ≥ 12 months, were invited to participate in the study.

The sample consisted of 53 post-menopausal women aged 48–64 years, having had at least one sexual activity (SA) during the month before counseling. Women with a history of sexual dysfunction, or having a partner affected by sexual dysfunction, or having used hormonal steroid treatment for less than 3 months or who had received phytoestrogens within 1 month before the start of the study, were excluded. Furthermore, women with abnormal uterine bleeding, or with endometrial thickness of 4mm or greater (measured by transvaginal ultrasound before study initiation), hormone dependent malignancies, or affected by diabetes, or by a chronic medical illness, were also excluded from the study.

Instruments

Each woman received a diary to record daily vaginal dryness symptoms and sexual events as well as adverse events (AEs) during treatment; moreover, woman had to report their daily food supplement usage from baseline to the end of the study, by means of a daily subjective self-administrated. The change in the Verbal Rating Scale was used to score vaginal symptoms, nominal vaginal dryness, vaginal irritation/itching, vaginal soreness, and dyspareunia[25]. The score was defined on a 0–3 intensity scale (0, none; 1, mild; 2, moderate; 3, severe).

Color Doppler sonography was performed to measure the clitoral blood flow by using a Voluson E6 (GE Healthcare, Solingen, Germany) with a 7.5MHz linear transducer.

Each woman was scanned in the gynecological position. The Doppler translabial probe was placed sagittally on the clitoris at an angle of ≤20 degrees, without exerting any significant pressure on the tissues. After identifying the clitoral artery using color flow mapping, the Doppler probe was positioned over the vessel and at least three sequential Doppler waveforms were obtained. Consequently, the peak systolic velocity (PSV) and the end diastolic velocity (EDV) were measured [9].

After the baseline evaluation, each participant was prescribed two tablets daily of the food supplement. Each instrument was used at baseline (T0), and the end of the study (60 days=T1).

Paired Student's t-test was used to compare changes between baseline and T1 regarding food supplement use for vaginal dryness score and clitoral arterial blood flow. The difference was estimated with 95% CI. Scores are presented as means ± SD. The result was statistically significance when p<.05. The statistical analysis was carried out using a software package for ™Windows 95 (Grantz SA, Primer of Biostatistics, McGraw-Hill Inc., New York, USA, 1997).

RESULTS

Of the women recruited to participate in the study, 12 (22.6%) refused to use the food supplement. Moreover, 7 (13.2%) who had started the treatment abandoned the study in the range of 20 to 35 days. Consequently, 34 (64.2%) women aged 48–64 years (mean age ± SD of 56.1 ± 5.3) completed the study.

Figure 1 shows the vaginal dryness changes after food supplement intake. At baseline (evaluation on 41 subjects), 10 (24.4%), 23 (56.1%) and 8 (19.5%) women rated their vaginal dryness as mild, moderate and severe, respectively. At the 8-week follow-up (evaluation on 34 subjects), 5 (14.7%) women referred to have no dryness [95% CI: 11.26 to -18.14; t=-8.526; p=0.001], and 20 (58.8%) and 9 (26.5%) women rated their vaginal dryness as mild [95% CI: 3.533 to -15.87; t=31.35; p=0.001] and moderate [95% CI: 11.2 to -33.4; t=4.004; p=0.01], respectively. Women who abandoned the study after starting the treatment were affected by severe vaginal dryness at the baseline evaluation (n.8=19.5%), consequently their data were not inserted in the statistical analysis. Interestingly, among the women who at baseline rated their discomfort as mild (n.10), after treatment 5, (50%) referred to have no dryness and 5 (50%) remained with mild vaginal dryness. Moreover, among those who at baseline recorded in their daily diary moderate vaginal dryness (n.23), after food supplement usage, 14 (60.9%) rated their dryness as mild and 9 (39.1%) remained with moderate dryness.

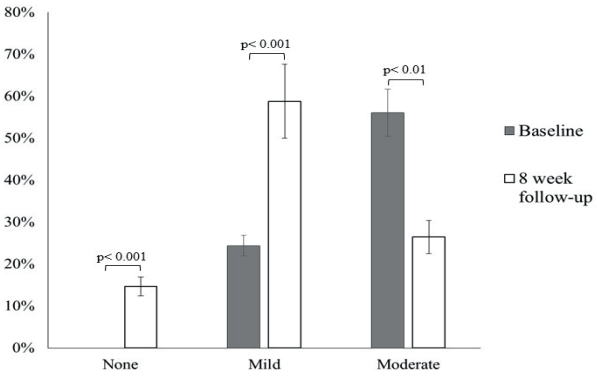

Figure 1.
Changes in vaginal dryness in postmenopausal women, at baseline and after 8 weeks of oral antioxidant food supplements

Figure 2 shows the results obtained by color Doppler sonography at baseline and at the end of the study. The mean PSV improved at the 8 week (1.71±0.7) follow-up compared to baseline values (1.38±0.6) [95%CI: -0.4015 to -0.2465; t=-8.753; p=0.03]. A similar improvement was observed for EDV [baseline (0.4±0.5) Vs 8 week follow-up (0.7±0.6), 95%CI: -0.5531 to -0.0469; t=-2.362; p=0.02].

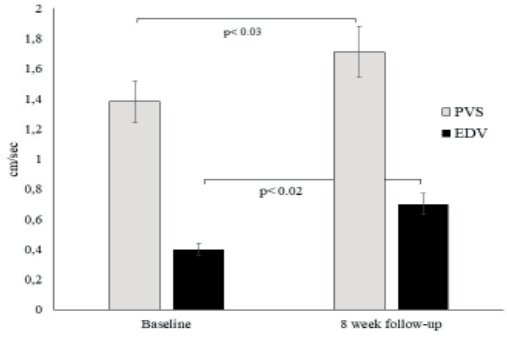

Figure 2.
Color Doppler ultrasonography of clitoral arterial blood flow of postmenopausal women, at baseline and after 8 weeks of oral antioxidant food supplements

DISCUSSION

This preliminary study aimed to investigate the effects of antioxidant food supplements on vaginal lubrication of postmenopausal women suffering from vaginal dryness. L-carnitine, Acetyl CoA, Coenzyme Q10, α-Lipoic Acid, N-acetylcysteine, carotenoid lycopene, trace mineral zinc, and manganese food supplements were used.

The first result was a partial improvement of vaginal dryness. In fact, not all women recorded in their diary benefits during food supplement usage. Among those who at baseline had rated their discomfort as mild, after food supplement intake, 50% referred to have no dryness and the remaining 50% still had mild symptoms. Moreover, among the women who at baseline had rated their vaginal dryness as moderate, after food supplement intake 60.9% rated their dryness as mild and 39.1% remained with moderate dryness. Women with severe vaginal dryness did not complete the study, interrupting food supplement intake, considering it not effective.

Unlike the above individual recordings of vaginal symptoms, the results of sonography highlighted changes in clitoral blood flow in all the women. The two parameters investigated, nominal PSV and EDV, were chosen because they indicate the quality of the arterial and venous function, respectively. In fact, low PSV means arterial insufficiency, while high EDV means venous obstruction[26]. The evidence of improvement of PSV values means a better arterial perfusion. Since the aim of this study was not to measure clitoral blood flow during sexual arousal, nor to evaluate changes in the sexual function of the participants, but only to investigate the structural and hemodynamic changes of the clitoris, the clitoral tumescent phase was not recorded in each woman. In the resting phase, only monophasic systole with a low-velocity, without diastole, waveforms are usually recognized in the clitoral artery. In the current study, only the filling phase was recorded, because the women were not engaged in sexual activities. In fact, during sexual arousal, intracavernosal pressure begins to rise and a dicrotic notch appears at the end of systole, and progressively a decreased diastole is observed[27]. As the intracavernosal pressure equals the systemic diastolic pressure, EDV disappears. Diastole is then reversed due to the increased intracavernosal pressure, reflecting the full engorgement phase.

Vaginal dryness is found to be the major cause of discomfort among menopausal women. Usually it can provoke signs and symptoms associated with any morbid process. The typical changes in external (labia minora, labia majora, clitoris) and internal (vagina, uterus) genitalia may arise, appearing as reduction in size, thinning of skin and mucous membranes, involution of the corpus cavernosa and loss of subcutaneous fat[28-30].

Today, estrogen vaginal therapy[31,32] or Ospemifene, a novel oral selective estrogen receptor modulator (SERM)[33] are used to treat postmenopausal women with genitourinary symptoms or with vulvovaginal atrophy, respectively. Unlike the above treatments, the efficacy latency time of the food supplements may depend on the time of their usage. Antioxidant food supplements could be effective in modulating postmenopausal symptoms, particularly vaginal symptoms, and could be well accepted by women who usually do not wish to use hormone therapy or cannot use it for medical reasons. The information on the benefits of food supplements must stress that their use be continued although their effectiveness tends to be delayed. On the basis of our previous and current investigations, we consider the first months of food supplement usage the time during which a series of objective and subjective adjustments could be initiated[34-37].

The present pilot study has some limitations. One is the small sample size; another is the lack of randomization with a control group with placebo; moreover, vaginal epithelial maturation and sexual function were not investigated. Consequently, a longer randomized study with a larger sample size and more data on safety and efficacy related to all components of the food supplements will be needed.

DECLARATION OF INTEREST

The authors report no conflicts of interest. The authors alone are responsible for the content and the writing of the paper.

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