

AVVISO PUBBLICO, PER TITOLI E COLLOQUIO, PER L'ASSUNZIONE A TEMPO DETERMINATO DI N. 2 RISORSE NEL PROFILO DI COLLABORATORE PROFESSIONALE DI RICERCA SANITARIA – CATEGORIA D, DA ASSEGNARE ALLA UOC UROLOGIA DELL'ISTITUTO REGINA ELENA NELL'AMBITO DEL PROGETTO DAL TITOLO "*LOW-INTENSITY EXTRACORPOREAL SHOCKWAVE THERAPY ON PENILE REHABILITATION AFTER ROBOT-ASSISTED SURGICAL TREATMENT OF GENITOURINARY CANCERS*", AFFERENTE AL SECONDO AVVISO PUBBLICO PNRR, CUP MASTER H53C24000260001, P.I. DR. GIUSEPPE SIMONE


Prova Colloquio


24 ottobre 2024 alle ore 13:00

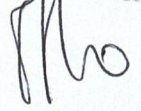
Prova tecnica


1. Cosa si intende per disfunzione erettile post-operatoria e a quali interventi è correlata;
2. Cosa sono le onde d'urto extracorporee e quali sono le loro potenziali applicazioni nella disfunzione erettile;
3. Terapia farmacologica della disfunzione erettile post-operatoria;
4. Test oggettivi e soggettivi per la valutazione della disfunzione erettile.


DR











Domande estratte n. 2 e n. 4

AVVISO PUBBLICO, PER TITOLI E COLLOQUIO, PER L'ASSUNZIONE A TEMPO DETERMINATO DI N. 2 RISORSE NEL PROFILO DI COLLABORATORE PROFESSIONALE DI RICERCA SANITARIA – CATEGORIA D, DA ASSEGNARE ALLA UOC UROLOGIA DELL'ISTITUTO REGINA ELENA NELL'AMBITO DEL PROGETTO DAL TITOLO “*LOW-INTENSITY EXTRACORPOREAL SHOCKWAVE THERAPY ON PENILE REHABILITATION AFTER ROBOT-ASSISTED SURGICAL TREATMENT OF GENITOURINARY CANCERS*”, AFFERENTE AL SECONDO AVVISO PUBBLICO PNRR, CUP MASTER H53C24000260001, P.I. DR. GIUSEPPE SIMONE

Prova Colloquio

24 ottobre 2024 alle ore 13:00

Prova di informatica

1. Che cos'è il back-up?
2. A cosa serve Power Point?
3. A cosa serve Access?
4. Che cos'è Excel?



The bottom of the page features several handwritten signatures in blue ink. A circular stamp is also present, containing the text "Istituto Fisioterapici Ospitalieri - ROMA". The stamp is partially obscured by the signatures.



Low-intensity extracorporeal shockwave therapy in the treatment of erectile dysfunction – a narrative review

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ABSTRACT

Objectives: To provide an overview of low-intensity extracorporeal shockwave therapy (LIEST) for erectile dysfunction (ED), pointing out which concepts are already consolidated and which paths we still need to advance.

Materials and Methods: We performed a narrative review of the literature on the role of shockwave therapies in erectile dysfunction, selecting publications in PUBMED, including only relevant clinical trials, systematic reviews and meta-analyses.

Results: We found 11 studies (7 clinical trials, 3 systematic review and 1 meta-analysis) that evaluated the use of LIEST for the treatment of erectile dysfunction. One clinical trial evaluated the applicability in Peyronie's Disease and one other clinical trial evaluated the applicability after radical prostatectomy.

Conclusions: The literature presents little scientific evidence but suggests good results with the use of LIEST for ED. Despite a real optimism since it is a treatment modality capable of acting on the pathophysiology of ED, we must remain cautious, until a larger volume of higher quality studies allows us to establish which patient profile, type of energy and application protocol will achieve clinically satisfactory results.

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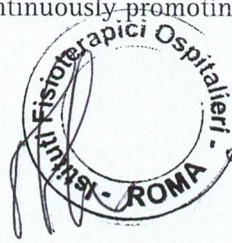
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INTRODUCTION

In recent years, there has been a substantial increase in the number of low-intensity extracorporeal shock wave therapy (LIEST) studies for erectile dysfunction (ED) (1). This new therapy comes with the hope of being the only modality capable of acting directly on the pathophysiology of ED, offering a remodeling of the erectile tissue

and thus some degree of recovery. However, like all new technology, especially those involving very technical aspects such as new devices, different types of energy, with physical aspects that are not familiar to the urologist's routine, require time and continuous verification to gain the real confidence of the doctors to recommend them. As these are areas that we do not master, we need to be continuously promoting training efforts on the



subject and for that reason, we have here, in this 11 article narrative review, the objective of promoting a concise didactic report that brings light to those interested in this new therapeutic modality applied to ED.

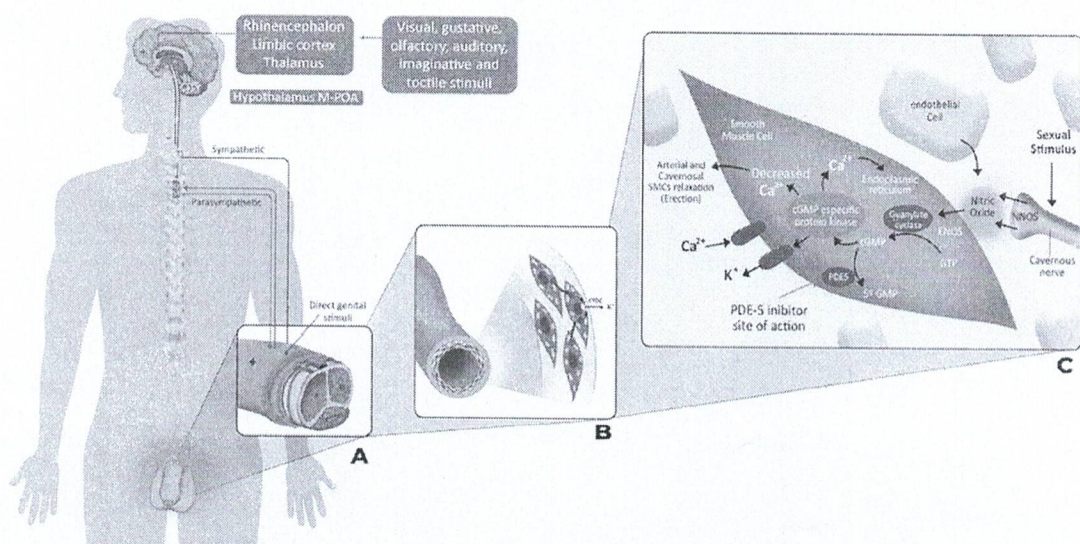
ED is a common condition that affects approximately 18 million adults in the United States (2). It is a condition known to impact not only sex life, but also negatively mental health and overall quality of life (3). The most common type of ED is vasculogenic, which occurs as a result of vascular impairment of penile arteries and/or veins, leading to insufficient blood flow or poor blood retention, usually caused by diseases as high blood pressure, diabetes and dyslipidemia. Didactically, if any of the necessary steps for a normal erection are affected, an erection dysfunction can be triggered. Thus, from psychological factors (anxiety, stress, depression, psychological disorders), to neurogenic impairment, from the neuro-axis at the central level (spinal cord diseases) to peripheral impairment such as it occurs in radical prostatectomy, are causes of ED. We cannot fail to mention endocrine causes as thyroid disease and hypogonadism. This whole set of diseases can occur alone

or altogether, ultimately causing, at the cellular level, the penile erectile tissue not to receive the necessary stimulus to initiate the erection process or to become insensitive to it, causing erectile dysfunction in various severity levels (Figure-1).

At the molecular level an erection is initiated when nitric oxide (NO) is released from non-adrenergic and non-cholinergic nerve fibers in response to sexual stimulation. This activates guanylyl cyclase, increasing the concentration of cyclic guanosine monophosphate (cGMP) in the smooth muscle cells of the penis. Simultaneously, parasympathetic cholinergic nerve fibers release acetylcholine, which activates adenylyl cyclase and increases the intracellular concentration of cyclic adenosine monophosphate (cAMP). Calcium levels then decrease, causing smooth muscle cells to relax and increase blood flow. The outflow of blood from the penis is impeded by compression of the subtunic venules, leading to a permanent state of rigidity (Figure-1C).

Another condition worth mentioning is ED as a commonly side effect among patients with prostate cancer who have undergone radical prostatectomy and/or radiotherapy (4-6). The

Figure 1 - From left to right: The figure demonstrates a coordinated and complex chain of events necessary to obtain an erection, from a stable psychological base, through an intact neuroaxis conducting the stimulus to penile vascular tissue, ultimately reflected in the cellular physiology that leads to the endothelial smooth muscle relaxation process, promoting erection. Any disturbance in one or more chains of this process can lead to erectile dysfunction.



use of nerve-sparing techniques during surgery has been shown to improve recovery of erectile function in many cases, however, some patients still experience ED after undergoing bilateral nerve-sparing radical prostatectomy, which can be caused by mechanical stretching or thermal damage to cavernous nerves, ischemic injury, or local inflammation caused by surgery (7). The increase in fibrosis and the decrease in the elasticity of the erectile tissue in the corpora cavernosa are factors that corroborate the picture. Factors such as age (older), presence of comorbidities, higher prostate-specific antigen (PSA) levels, and worse pretreatment sexual health scores (IIEF score) have been associated with a greater likelihood of developing erectile dysfunction after treatment of prostate cancer. Phosphodiesterase-5 (PDE5i) inhibitors are currently used and have been shown to increase levels of cyclic GMP in penile smooth muscle cells, preserving smooth muscle content and reducing body fibrosis (8, 9). The use of vacuum erection devices, intraurethral suppositories and intracavernous injections do not meet the desired efficacy in penile rehabilitation after radical prostatectomy (10). Thus, what was sought was a method capable of acting on the etiology of erectile dysfunction at the cellular level, leading to local remodeling and thus acting in the various forms of ED (11). We sought to find a method capable of acting on the etiology at the cellular level, leading to local remodeling and thus acting on the various forms of erectile dysfunction.

In this scenario came the LIEST, a new treatment option for ED that has shown promising preliminary results (12-14). It differs from other erectile dysfunction treatments, which typically only provide symptom relief, as it works on the underlying pathophysiology of erectile dysfunction. LIEST uses an electro-hydraulic or electromagnetic generator to deliver sound waves directed to the corpora cavernosa and crura, at an energy density of around 0.09 mJ/mm (Figure-2). The therapy was first tested for vasculogenic ED in 2010 by Vardi et al. due to its potential to promote neovascularization in the myocardium (15, 16). LIEST has also been

recognized to increase nitric oxide synthesis in penile tissue and support stem cell proliferation (17). Multiple meta-analyses have suggested that LIEST is an effective treatment for erectile dysfunction, resulting in an improvement in the erectile function domain scores of the International Index of Erectile Function (IIEF) and may play a role not only in vasculogenic erectile dysfunction (neovascularization) but also in neurogenesis (18, 19) (Figure-3).

However, despite the promising results, this literature review suggests that there is a lack of robust data on the use of LIEST for erectile dysfunction, regardless of etiology. This is because the researches have small samples, with varied treatment protocols (number, time and interval between sessions and association or not with oral therapy for ED), limited follow-up, heterogeneity of devices and energy configuration and applied frequency, divergences regarding the application sites, creating an enormous challenge for data interpretation and exclusion of biases making it difficult to draw firm conclusions about the effectiveness of LIEST (Figure-4).

We hope, through this review, to point out which concepts are already consolidated and which paths we still need to advance.

MATERIALS AND METHODS

We performed a review about the role of shockwave therapy for ED with a bibliographic search on Pubmed restricted to publications from 2010 onwards, using key expressions as "low-intensity extracorporeal shock wave therapy", "erectile dysfunction" and "randomized controlled trial". The literature search was carried out independently by VR, SM and FL and consensus on article selection was reached through open discussion. The review included all references to relevant studies and full-text articles in peer-reviewed journals that evaluated the impact of LIEST on erectile dysfunction of any etiology. The present review only included randomized clinical trials, systematic reviews or meta-analyses with a single exception - a cases series - due to its notorious relevance.