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Isabel Sofia Monteiro Casimiro

What do we know on how to treat vaginismus?

O que sabemos sobre a forma como se trata o vaginismo?

JANEIRO, 2021

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NOME

Isabel Sofia Monteiro Casimiro

NÚMERO DE ESTUDANTE	E-MAIL
201306469	isabelsofiacasimiro@gmail.com

DESIGNAÇÃO DA ÁREA DO PROJECTO

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What do we know on how to treat vaginismus?

ORIENTADOR

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COORIENTADOR (se aplicável)

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Faculdade de Medicina da Universidade do Porto, 8 / 1 / 2021

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What do we know on how to treat vaginismus?

Authors: Isabel Sofia Monteiro Casimiro[1], Miguel Ângelo Marques Ferreira de Bragança[2]

Filiation:

1- 6th year student from the Integrated Masters in Medicine at Faculdade de Medicina da Universidade do Porto, Portugal
2- Psychiatry and Mental Health Clinic, Centro Hospitalar de São João, Porto, Portugal; Invited Assistant Professor at Faculdade de Medicina da Universidade do Porto, Portugal

Address for correspondence:

Isabel Sofia Monteiro Casimiro
Rua Padre Américo, 92, 4420-239 Gondomar, Portugal
e-mail: isabelsofiacasimiro@gmail.com

What do we know on how to treat vaginismus?

ABSTRACT:

Background: Despite its prevalence and its negative impact on women's quality of life, no standardized therapeutic interventions have been established for the treatment of vaginismus.

Aim: To clarify what can be done in terms of treatment to help women with vaginismus.

Methods: We conducted a research on Pubmed's electronic database, using the following query: (("Cognitive Behavioral Therapy"[Mesh]) AND "Vaginismus"[Mesh]) OR ("Vaginismus/drug therapy"[Mesh] OR "Vaginismus/rehabilitation"[Mesh] OR "Vaginismus/therapy"[Mesh]) OR (("Botulinum Toxins, Type A"[Mesh]) AND "Vaginismus"[Mesh]) OR (("Physical Therapy Modalities"[Mesh]) AND "Vaginismus"[Mesh]) OR (("Psychotherapy"[Mesh]) AND "Vaginismus"[Mesh]) OR (("Biofeedback, Psychology"[Mesh]) AND "Vaginismus"[Mesh]) OR (("Surgical Procedures, Operative/therapy"[Mesh]) AND "Vaginismus"[Mesh]). From the 68 articles obtained, 27 were included according to their relevance. Further relevant literature was added posteriorly.

Results: From multidimensional approaches to therapies applied in only one session, there are several effective treatments described for vaginismus. It is possible to categorize them as: dilator therapy, physiotherapy, psychological therapy and botulinum toxin injections. Psychological interventions are the most studied therapies in our research, presenting a broader approach that targets the multifactorial nature of this disorder.

Clinical Translation: Medical education programs on this field should be improved and additional trials, with more appropriate outcomes, larger samples, longer follow-up times and more adequate control groups, should be conducted.

Strengths & Limitations: This work not only gives an insight on vaginismus treatment, but also on its clinal context, namely its etiology and diagnosis. The methodological limitations found in our research, from the lack of control groups to a variability in outcome variables, hinder the interpretation of the results.

Conclusion: Physicians can offer different types of efficacious treatments to their patients, according to their needs and preferences, being cognitive behavior therapy (CBT) the more complete one.

Keywords: Psychological therapy. Cognitive behavioral therapy. Dilator therapy. Physiotherapy. Electromyographic biofeedback. Botulinum toxin.

Introduction

Vaginismus was first named and described in 1861 by an American gynecologist, Dr. J. Marion Sims, who described it as an uncontrolled contraction of the muscle around the vaginal wall, linking symptoms of vaginal hypersensitivity to muscular spasm.[1] Basson defends vaginismus as an impossibility for women to have vaginal penetration, even though that is their wish.[2] In fact, women with vaginismus can experience real difficult with tampon or finger introduction and with gynecologist examination, not only with sexual intercourse.[2,3] Vaginismus is a common condition that has a negative impact on health, it can promote the non-consummation of marriage, once it affects the ability of reproducing.[4]

Women with problems with penile-vaginal intercourse were usually diagnosed with dyspareunia or vaginismus. Vaginismus was the diagnose given to women who found penetration impossible or almost impossible, while those describing constant and distressing pain with intercourse were diagnosed with dyspareunia.[3,5,6]

Since 2013, with the publication of the *fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders*, vaginismus was included in a group named "Genito-pelvic pain/penetration disorder" (GPPPD) that condensed the categories of dyspareunia and vaginismus, which despite separate entities the border may be tenuous, once vaginismus can be secondary to dyspareunia.[7] To make the GPPPD diagnosis at least one of four criteria is required: (1) persistent or recurrent difficulties with vaginal penetration during sexual intercourse; (2) marked genital or pelvic pain during intercourse attempts; (3) marked fear or anxiety about vulvovaginal or pelvic pain in anticipation of, during, or as a result of vaginal penetration; and (4) tensing or tightening of the pelvic floor muscles during attempted vaginal penetration. Also, the persisting symptoms should cause significant distress during at least 6 months and not be better justified by another problem.[5,6]

The definition of vaginismus is often discussed. This novel diagnosis introduced numerous worries insofar as some authors defend the two collapsed entities have distinctive clinical characteristics, such as etiology, clinical presentation and treatment. In fact, this update might have not yet been reflected in clinical practice and trials.[8–10] Thus, aiming to answer the question "What do we know on how to treat Vaginismus?", we chose consider "vaginismus" as the main topic of our work, instead of GPPPD.

Incidence

The true incidence of vaginismus remains unknown.[4] Definitional problems are an important contributor for this fact, nevertheless we should bear in mind that feelings of shame and hopelessness prompt women to remain silent about their problem, which can still underestimate the numbers of this condition.[11] The prevalence of vaginismus can considerably vary from 6,6%, considering a Portuguese community sample,[12] to 42%, concerning clinics with expertise in female sexual disorders.[13]

Etiology

The etiology of vaginismus involves multiple biopsychosocial processes, which highlights its multifactorial nature. Therefore establishing its etiology can be complex.[14] Besides this, it is still unclear whether comorbidities associated with vaginismus are causes or consequences of this condition insofar as psychological traits seem to act not only as predisposing factors, but also as persisting ones.[8,15]

Even though vaginismus is a multicultural disorder, it is believed to be much more common in an environment that values virginity and promotes strict sexual education and ignorance to a pleasant sexual experience of women.[16] Women with vaginismus also have a higher chance of presenting a background of sexual abuse.[17] Pacik describes several risk factors for this disorder, such as painful first sexual contact or painful gynecological examination. According to the author, the extreme fears of an unwanted pregnancy or a possible sexually transmitted disease might also be partly responsible for this disorder.[3] In fact, the fear of infection is confirmed by Borg in his article through the study of brain activity. The author shows that when exposing women with vaginismus to sexual stimuli they have the same response as to disgust-inducing stimuli, which substantiates the subsequent defense response.[18] Vaginismus can also be seen as a protective response to penetration, once these women respond with augmented pelvic floor tonicity to a threatening visual stimuli.[7]

Women with vaginismus have often a negative attitude towards their sexuality and negative cognitions about pain, such as hypervigilance and catastrophization, which can lead to and increase their pain experience.[3,19] In fact, the persistence of pain in vaginismus can be explained in light of the “fear-avoidance model of chronic pain” as a vicious circle, where a painful experience can lead to fearful and catastrophic thoughts and subsequently to somatic hypervigilance. This increases negative sensations and emotions related to pain and promotes an avoidance of sexual activity. The avoidance behaviour doesn’t allow for the disconfirmation of automatic thoughts, such as “penetration is impossible” or “it will always cause pain”.[7,20] Furthermore, the

hypertonicity of the pelvic muscles intensifies the painful experience and pain hinders genital excitement, causing less lubrication and an even more painful experience. This vicious circle of repeated painful experiences contributes to the avoidance behaviour based on fear.[20] Besides this, an overly sympathetic partner as well as a hostile one can also perpetuate this circle by not stimulating the search for adaptive responses to pain.[21]

Kadir et al. describe anxiety and obsessive-compulsive disorders as risk factors for vaginismus. The authors defend that higher brain functions of the central nervous system control directly the local reaction in the genitopelvic region.[14] In reality, anxiety leads to the reflex contraction of the pelvic floor muscles. At this respect, one study using electromyography in a non-clinical sample showed that contractions of the pelvic floor are more profound in states of anxiety when compared to the response to a sexual threat.[22]

Diagnosis

The diagnostic difficulty of vaginismus can cause frustration for both patient and therapist. When examining a patient who is unable to have sexual intercourse as result of pain, it is first necessary to discard pain based on a pathological finding. While obtaining the anamnesis, it is important to find out how long the pain lasts, whether it is acute or chronic, what is its location, intensity and whether the etiology is already known. It is also important to investigate whether it has a psychogenic basis, causes fear, anxiety, depression, feelings of helplessness, and whether and how it interferes with sexual life, not forgetting to look for associated psychiatric diagnoses, family and cultural background.[23] In vaginismus, standard gynecological examination is frequently not possible, but genito-pelvic examination is essential, and might include “pain mapping”, “vaginal pH measurement”, and “evaluation of the pelvic floor tonus”. Depending on examination findings, more exams might be needed.[4,24] In these women, at least a basic psychosexual examination using a questionnaire is appropriate.[4] The Female Sexual Function Index (FSFI) questionnaire is used for the general assessment of a woman's sexual functions, allowing for the evaluation of the level of patient’s sexual desire, arousal, the ability to achieve sufficient lubrication, orgasm, pain and overall satisfaction with her sexual life in the last four weeks. Superior scores are associated with better sexual function, being 26.55 the cut-off point score for having sexual dysfunction.[25]

As most other sexual dysfunctions, vaginismus can be lifelong/primary or acquired/secondary and classified as mild, moderate or severe.[5] Patients with lifelong vaginismus have never experienced painless sexual intercourse while patients with acquired vaginismus had sexual relations without pain and only subsequently it became

painful.[3] Regarding vaginismus severity, Lamont classifies vaginismus in 4 grades, depending on patients' history and how they behave during a gynecologic examination. Patients with grade 1, the mildest form, are noted to have spasms of levator and perineal muscles but can relax with reassurance given by the physician and tolerate a gynecologic examination. Grade 2 patients have generalized spasm of the pelvic muscles, cannot relax but examination can still be performed. Grade 3 adds an elevation of the buttocks to avoid being examined. And patients with grade 4 elevate their buttocks and retract and adduct their thighs to prevent examination.[26] Pacik introduced grade 5 severity for patients who could not only be examined, but when the examination was attempted they had a visceral reaction, such as palpitations or uncontrollable shaking. Distinguishing severity is an important step before recommending treatment once it can affect its success and duration.[27]

Vaginismus is a problem for many women around the world, having an important negative effect on the quality of their lives.[8] Therefore every physician should be aware of this condition and recognize the most effective treatments for each of their patients.

Since the sensate focus technique developed by Masters and Johnson in the early 70's, several approaches have been developed such as cognitive behavioral therapy (CBT), pelvic floor physiotherapy and pharmacological therapy.[8]

Methods

Our revision was made utilizing Pubmed's electronic database, with the last research made on September 7, 2020.

On Pubmed's platform we used the following query: (("Cognitive Behavioral Therapy"[Mesh]) AND "Vaginismus"[Mesh]) OR ("Vaginismus/drug therapy"[Mesh] OR "Vaginismus/rehabilitation"[Mesh] OR "Vaginismus/therapy"[Mesh]) OR (("Botulinum Toxins, Type A"[Mesh]) AND "Vaginismus"[Mesh]) OR (("Physical Therapy Modalities"[Mesh]) AND "Vaginismus"[Mesh]) OR (("Psychotherapy"[Mesh]) AND "Vaginismus"[Mesh]) OR (("Biofeedback, Psychology"[Mesh]) AND "Vaginismus"[Mesh]) OR (("Surgical Procedures, Operative/therapy"[Mesh]) AND "Vaginismus"[Mesh]).

From the 68 articles obtained with our query, we excluded articles written in other language than English or Portuguese, as well as reviews. From these last 41 articles, 8 were excluded by reading their titles and abstracts, leaving 33 articles left. In a second phase, the articles were read in their full and selected according to their relevance. During this phase, 6 further articles were excluded, ending with a total of 27 articles. For each included study, the following information was obtained: title; author, year of publication, country, study type, studied population, methods used and main results/conclusions.

Further relevant literature was included posteriorly, during the research of the topic.

Results

Due to the multifactorial nature of this disorder, a diversity of effective approaches can be adopted to help women overcome vaginismus,[28] such as dilator therapy, physical therapy, psychotherapy or CBT.[4] In order to address the several dimensions of vaginismus, a multidisciplinary team should be involved in its assessment and treatment. This team must include at least a gynaecologist, a physical therapist and a psychologist or sex therapist.[29] A combination of different approaches is especially recommended on the treatment of the severest forms of this disorder.[27]

What do we know on dilator therapy?

Not only the physical facets of vaginismus can be addressed in a dilation program, but also the psychological ones, particularly the fear and anxiety of penetration.[27,30,31] The application of a systematic desensitization, using progressively larger dilators, also known as vaginal trainers (VTs), helps women stretch their vaginas, allowing them to tolerate vaginal penetration. Dilators can be made of plastic, silicone or glass, existing in a variety of sizes.[4] According to Pacik, the mere recommendation to acquire a set of dilators, not explaining to the woman how to use them nor giving the support they need to surpass the emotional aspects of this condition, promotes the failure of this type of treatment. Therefore, an educative explanation is very helpful in reducing the anxiety associated with this task. It is also important to clarify that this is a progressive and continued work until a comfortable transition to intercourse could be made. Any time a problem occurs during treatment, patients should be able to consult their therapists. In practical terms, finger penetration (women's own fingers or their partner's fingers) can be helpful to initiate dilation; the use of a lubricant is suitable; it is also encouraged to dilate, during the first month, two hours a day, one hour in the morning and one hour in the evening or two hours in the evening. As the larger dilators become comfortable, this schedule can be reduced.[4] According to Pacik, women usually don't dedicate enough time to the dilation program, and for this reason they can't achieve comfortable penetration.[3]

Considering women with vaginismus are a neglected population, one study was conducted to investigate the experience of women treated with vaginal dilators, finding that women often felt angry and upset with this task and described finding privacy and time to do it as frequent problems. Also, women had difficulties obtaining technical advice on how to use them, sometimes using dilators in painful ways. This implies that there is not only lack of information among patients but also among phisicians.[32]

Dilator therapy is often described as part of a larger treatment program, such as behavioral sex therapy, CBT, expose therapy and physiotherapy.[7,33–42]

What do we know on physiotherapy?

Physiotherapy has the aim to detect the exact sites of triggering muscle spasms, the so-called myoskeletal trigger points. Physiotherapists specialized in pelvic floor can help women learn how to relax the levators, muscles of the vaginal introit and even rectum.[43] By exposing patients to vulvo-vaginal touch, pressure and movement, together with alternative treatments, physical therapy will decrease fear, anxiety and reactive muscle activity, through exposure and desensitization exercises.[37] This can be very helpful in the process of vaginal dilation.[4]

Physiotherapy is described as including several steps and techniques, all accompanied by the therapist. It often initiates with an educational session about sexual anatomy and physiology, proceeding to relaxation exercises and gradual exposure to finger penetration and feared objects, such as tampons, speculums and vaginal dilators. Home exercises, such as stretches or dilator insertion, are also an important component of this treatment and they might be done by the patient alone or with her partner.[28,37,38] During the treatment process, sensate focus technique, at home with the partner, will help the patient have a feeling of closeness and comfort. This last technique excludes vaginal penetration, focusing on the massage of the entire body, with the exception of breasts and genital areas.[28]

Physiotherapy may also include the use of electromyographic biofeedback, as a teaching tool, or transcutaneous electrical stimulation, to reduce pain through nociceptive inhibition.[37] Electromyographic biofeedback, in which a electromyography sensor is inserted into the vagina, helps women understand the degree of tension of their pelvic floor muscles, making it easier for them to know how to lessen muscles tension and relax.[28] Electromyographic biofeedback can be used alone or in combination with physical therapy in the vaginismus treatment.[4]

In terms of length of treatment, there might be a significant range of time needed to reach patients goals, with several patients requiring much more time.[37] While some studies present a mean duration of 47 weeks in therapy, with an average of 29 sessions needed for full physical therapy treatment, others applied this therapy for 12 weeks with one weekly session of one hour.[28,37]

In Yaraghi et. al's randomized clinical trial (RCT), the assessment of "physiotherapy plus electrical stimulation associated with desensitization techniques"

against botulinum toxin injections, showed that physiotherapy had a higher success rate in all sexual functioning domains. When comparing FSFI domains within group before and after intervention, there was a sexual functioning improvement in all six areas (desire, arousal, lubrication, orgasm, satisfaction and pain) in the group treated with physiotherapy, being this difference statistically significant ($p<0.001$), while there were no significant differences in the botulinum toxin injection group in the areas of desire ($p=0.79$) and lubrication ($p=0.96$). Concerning successful intercourse, the authors also found a significant difference ($p=0,014$) between the two groups, with the physiotherapy group having a superior proportion of successful intercourse, 26 out of 28 patients versus 20 out of 30 patients. Yaraghi et. al recommend consider physiotherapy procedures as first-line treatment for vaginismus.[28]

These results differ from a previous retrospective chart review and interview study, where women reported to have some symptoms remaining after physical therapy, despite the fact they had achieved the ability to enjoy sex. These symptoms included pain, anxiety or fear and self-reported pelvic floor tension. Results that enhance the necessity of other interventions particularly targeting sexual rehabilitation as a complement for physical interventions.[37]

What do we know on psychological therapy?

Psychological interventions studied in this field are mainly cognitive-behavioral in nature. Involving cognitive restructuring, CBT contributes to the understanding of the thoughts and feelings influencing women's behaviors and to the modification of their avoidance behavior and fear of penetration.[7,44] On the other hand, behavior sex therapy eliminates erroneous cognitions with the help of several interventions, such as systematic desensitization or sensate focusing, that will reduce avoidance behavior and increase successful penetration model behavior.[8] The difference between these two entities resides on the cognitive restructuring, that is applied on CBT but not on behavior sex therapy. Sex therapy targets distorted cognitions, dysregulated emotions, maladaptive behaviors as well as harming relationship dynamics in order to reduce pain, increase desire and arousal and improving couple interactions.[5] CBT can be done as individual, couple or group sessions. Cases with psychological and/or relational problems as the predominant components, might benefit the most from these psychotherapeutic interventions.[7]

Like dilator therapy, CBT is often involved in a wider treatment, being often described in the literature as including different components on its approach, such as psychoeducation, relaxation and pelvic floor muscles exercises, desensitization with

gradual exposure, self-exploration, and sensate focus exercises.[7,33,35,39,44–46] The multidisciplinary team implied in this treatment should include not only a sex therapist, but also a gynecologist, responsible for the localization of the painful area and for discarding physical pathology, and a physical therapist specialized in pelvic floor dysfunction. It is important to coordinate psychological therapy with other treatments and deliver them simultaneously during the therapy and preferably all healthcare providers can work concomitantly. Nevertheless, referrals to other health professionals may only be possible after sex therapy, particularly for anxious patients. Even after the therapy, follow-up therapy sessions are important to be provided, so that patients and their partners keep discussing their concerns and feelings, which will reenforce improvements and avoid recurrences.[5]

In *The Wiley Handbook of Sex therapy*, sex therapy is described as incorporating assessment and treatment, with the latter being divided into three stages. Stage 1 focuses on empowerment and reconnection as a couple, stage 2 meets "the crossroads of pain, sex, self and partner" and incorporates the coordination with other healthcare providers and finally step 3 aims to consolidate gains and prevent relapse. According to the authors, there are many ways to interact physically, consequently sexual activity doesn't have to stop during treatment. In fact, before the deterioration of sexual interactions, the sensate focus technique can have a crucial role in engaging in a kind of sexual retraining which focal point lies on sensuality and eliminating the pressure of performance and penetration.[5]

Using a short sample of 12 women, Seo et al. studied the efficacy of functional electrical stimulation - biofeedback with CBT as a standard therapy for vaginismus. Authors consider that the number of participants was not enough for statistical analysis, but that results were acceptable, having all patients reached successful sexual intercourse. The combination of these two treatments might be an effective and clinically suitable treatment for vaginismus.[35]

Concerning sex therapy particularly in traditional Islamic couples, Yasan et al. conducted a prospective study, where 29 (65.9%) out of 36 patients had successful outcome of treatment, concluding that in the cultural environment studied, sex therapy is a viable treatment for vaginismus. The authors also described "married by matchmaker without consent" (OR = 0.060, CI = 0.046–0.771, P = 0.031) and "not allowing pelvic examination" (OR = 0.124, CI = 0.016–0.941, P = 0.044) as negative predictors for successful result of sex therapy and suggested some modifications, such as allowing enough time during therapy to expose culturally determined problems. The group who

completed the treatment required 9.48 ± 1.67 number of therapy sessions.[46] More promising results were found in a bigger prospective study, enrolling 120 couples, 93.3% of which reached successful penetration, and 83.3% achieved intercourse with orgasm regularly after a 3-month treatment based on Master and Johnson's sex therapy. The treatment applied in this study included "exercises for vaginal dilatation (…); relaxation of the pubococcygeal muscle; local application of Xylocaine jelly, oral analgesics, and muscle relaxant before penetration attempts". Dilator exercises were not recommended. Authors think this aggressive management should be encouraged by clinicians for women with vaginismus. Another finding of the study was the correlation between how long the relationship was unconsummated and the outcome, being "the difference between groups of less than 2 years and more than 2 years [of unconsummation] ($p < 0.01$) and between 2 to 3 years and 3 to 10 years ($p < 0.05$) significant (Chi-square)". In fact, couples with unconsummation of less than 2 years all succeeded, while among couples between 3 to 10 years, only 63.5% were successful. This study also showed a positive relation between severity of vaginismus, amount of therapy sessions required and success rate.[45]

Lankveld et al. also believe CBT could be an effective therapy for primary vaginismus, regardless of the modest results of their RCT that has compared the efficacy of CBT applied in two different formats (group and bibliotherapy) with a waitlist control (WLC) group (N = 117). The two treatment setups did not generate differential results. Even though with a small effect, CBT was efficacious. When comparing the treatment and the control groups, 14% (9% group therapy, 18% bibliotherapy) of the first one obtained successful intercourse while none of the participants in the latter group achieved the same result. This was still verified when following up at 3-month and 12-month time periods.[7] The increase of intercourse (outcome) was partly due to a decrease in fear of coitus and in avoidance behavior, independently of the type of CBT applied.[33]

Having this in mind, Ter Kuile et al. reached a success rate of 90% (9 of 10 patients) in their subsequent study, where they focused more on exposure to feared stimuli during penetration. The authors tested "Therapist-Aided Exposure" as a therapy for women with lifelong vaginismus, where the treatment applied consisted of "a maximum of three 2-hour sessions within 1 week, in which the participant was exposed to the feared penetration objects". The exercises were conducted by a female therapist (psychologist or gynecologist) who assisted in shaping the vaginal penetration behaviour step by step. Catastrophic cognitions were also addressed in these sessions, as the therapist helped patients and her partners to verbalize their expectations. After each session, the couple was provided with several exposure homework assignments. The

subsequent exposure sessions also served to discuss homework and possible questions. Even though there were clinical advances in “perceived control beliefs regarding penetration” and a noticeable decrease in “complaints of vaginismus, coital fear, and catastrophic and pain beliefs regarding vaginal penetration”, this treatment produced no significant alterations regarding patients’ sexual functioning with their respective partners. Therefore, a combination of therapies specifically highlighting sexual pleasure and arousal may be indicated for some women.[40] Years later, the efficacy of this treatment was provided by a waitlist RCT with a larger sample of 70 women, where 31 out of 35 (89%; 95% CI [72%, 96%]) patients stated they had sexual intercourse after their treatment while only 4 out of 35 (11%; 95% CI [4%, 28%]) patients in the control condition reported the same. The results were consistent with the ones obtained in the previous study, with about half of the participants still reporting discomfort or painful intercourse.[42] Nevertheless, this therapist-aided exposure approach contributed to the reduction of the strength of deliberate fear that was showed to be more characteristic of women with lifelong vaginismus when compared to controls, and to the increase of global positive associations with sexual stimuli.[34] These results are consistent with the ones obtained in a following study of the same authors, where “catastrophic pain penetration beliefs” and “genital incompatibility beliefs” were meaningfully diminished after patients were subjected to 6 weeks of therapy compared to a WLC. Moreover, therapist-aided exposure increased “perceived control penetration beliefs”, resulting in higher coitus frequency at 6 weeks and declining symptoms of vaginismus at 12 weeks. Thus, exposure exercises seem to mediate changes in “penetration beliefs” and subsequent treatment outcome in patients with primary vaginismus.[41]

Focusing on CBT, a pilot RCT in 2017 studied the efficacy of an “internet-based guided self-help intervention” for vaginismus. The allocation of seventy-seven women with vaginismus was randomly made to an intervention group (IG) and a waiting control group (WCG). The intervention in this study involved texts and interactive elements, and included 10 sessions comprehending psychoeducation, relaxation exercises, cognitive restructuring, sensate focus exercises, and gradual exposure with dilators. In the present study, the differences between the IG and WCG in terms of primary outcome was not statistically significant, with 34% of the patients in the IG describing that they successfully achieved sexual intercourse compared with 21% in the WCG. In terms of non-intercourse penetration ability (secondary outcome), the between-group difference detected at 6-month after follow-up was statistically significant, favoring the IG ($F_{1,48} = 9.26$, $P < .01$, $d = 0.56$). The authors concluded “internet-based interventions” for this disorder could be an encouraging proposal as a first step in a stepwise care treatment, complementing

other existing treatments.[39] These results contrast with the ones obtained by Engman et al., where the CBT applied consisted of weekly or biweekly sessions, for a mean of 14 sessions, in which a method of systematic desensitization educated women to experience vaginal penetration without fear or pain, by exposing them to penetration, step by step. To study long-term coital behavior in women treated with CBT, a questionnaire was sent to 59 women treated with CBT, finding that even though 81% of women had achieved intercourse, solely 6% of them achieved it without pain. Also, the authors described participants as having a significantly greater "self-worth as sex partners, women and human beings" at follow up, when compared to pre-treatment.[44]

A recent systematic review and meta-analysis has shown that psychological therapies tended to improve the chance of successful intercourse, even though this change is not significative (OR 10.27 [95% CI 0.79-133.5], P = 0.075). The meta-analysis of only 3 RCT studies could explain the lack of clear effect. In different circumstances, the meta-analysis of 43 observational studies showed a global elevated cumulative success rate no matter which therapy was applied (success rate 0.79 [0.74-0.83]), with behavioral sex therapy being the most represented regimen, obtaining a success rate of 79%.[8]

What do we know on botulinum toxin A?

The treatment with botulinum toxin A, also known as Botox A, consists of a local injection of botulinum toxin in patients' levator ani (puborectalis) muscles "at three points in both sides using a 23-gauge needle". Five hundred units of botulinum are "diluted in 1.5 cubic centimeter of normal saline associated with a total dosing of 150–400 units". In severe cases, some drugs such as opioids and benzodiazepines can be used to relief pain before injection.[28] The mechanism of action lies in the blockage of neuromuscular junction, in which the synaptosomal-associated protein 25 (SNAP-25) is proteolytically degraded by type A botulinum toxin, preventing ultimately the release of neurotransmitters by secretory vesicles. The injection of botulinum neurotoxin into the affected muscles diminishes muscle spasms and pain.[47]

In a RCT already mentioned in this study, Yaraghi et. al investigated the effectiveness of two different approaches on the sexual functioning of women with primary vaginismus, comparing 12 weeks of "physiotherapy plus electrical stimulation associated with desensitization techniques" and one session of botulinum toxin injections. Sexual dysfunction frequencies decreased by 26.6% and 50% in the injection botulinum group and physiotherapy group respectively ($p = 0.008$ and $p < 0.001$). Even though botulinum toxin injection did not produce a significant change in the desire

(p=0.79) and lubrication (p=0.96) areas, it caused an increase on the total sexual function index, comparing to pre-treatment.[28]

A systematic review followed by meta-analysis from 2012 defended botulinum toxin as an effective approach for women with vaginismus, in particular the treatment-refractory ones. Results from the compiled 5 studies indicated that the use of botulinum toxin significantly increases the chance of patients to respond to vaginismus treatment (pooled odds ratio of 8.723 (95% CI 1.942–39.162) reaching z = 2.827 and p = 0.005).[48]

Also, a retrospective study in Western Saudi Arabia has shown that botulinum toxin provided a quicker and more effective treatment when compared to conventional therapy (ex: Kegel exercises, physical therapy, sex therapy, lubricants, and dilator therapy). Six patients were offered the treatment with botulinum toxin injection after 4 months of showing no improvement on conventional therapy, 5 of them reported having satisfactory intercourse after only one injection.[36] Therefore, the authors believe that this method could be helpful specially for severe cases of vaginismus (grades 3 and 4) or following conventional therapy failure, once conventional therapy could still be helpful on overcoming the fear of intercourse and associated pain, disgust of self-exploration and other issues intrinsic to vaginismus.[9,36]

Another study from 2009 had studied and recommended the use of Botox as an effective treatment option for secondary vaginismus treatment-refractory patients. Improvements began after one cycle, nevertheless most of the patients needed reinjection (28 of 39). From the patients who had completed the study, 63.23% entirely recovered from vaginismus, achieving the normalization of their sexual intercourse with a mean of 2.7±1.5 treatment cycles (range 1–7), ranging from 4 to 94 weeks, with benefits persisting during the subsequent months (mean 23.75±7.3, range 13–35.25). Transient urinary incontinence was only described by one woman and no other major adverse events were reported.[47]

Pacik et. al studied a large cohort of patients in a multimodal program that included Botox injections. According to the injection protocol used in this study, 50 units of Botox were “delivered above, into, and below the hymenal fragments on each side to include the full width of the bulbospongiosum”. After the Botox injections, patients received injections of bupivacaine and epinephrine in their vaginal walls, to allow them to wake up without pain and with a large (#5 or #6) dilator on place. Conscious sedation was needed with the procedure lasting approximately half an hour. Waking up with a large dilator helped patients to realize that penetration was possible. Before discharge, couples learned how to move the dilator having directives to keep and sleep with #4

dilator into the vagina. This program also included group counselling, which not only provided patients with post-procedure guidance for dilator use, lubricants and evolution to intercourse, but it was also beneficial in preserving a support system. The estimated time in which Botox was effective was approximately 2 to 4 months, allowing patients to feel at ease with dilation. Following the treatment, 171 patients (71%) accomplished pain-free intercourse, at a mean of 5.1 weeks (median = 2.5). Also, a statistically significant difference was found ($t = 8.8$, $df = 88$, $p < 0.001$) between FSFI scores from baseline measurement to post-treatment. Minor adverse events, like temporary mild stress incontinence or excessive vaginal dryness occurred in six patients, disappearing after 4 months. No major adverse events were reported.[3]

Discussion

Even though focusing vaginismus treatment, our work required a bigger introduction to better understand and contextualize the results found in the literature. Concerning vaginismus' prevalence and its significant impact on quality of life, our goal was to clarify what can be done in terms of treatment to help women with this disorder, once no standardized therapeutic interventions have been developed.[8]

We have found a variety of treatments described in the literature, from multidimensional approaches to treatments applied in only one session. The analysis of RCTs showed a tendency toward greater efficacy of active treatment compared to controls. Even though some authors have defended "no approach is superior to the others", respecting penetrative intercourse achievement,[8] our research recommend a multidimensional approach,[7,33–35,37,39–42,44–46] such as CBT, as a more complete therapy for vaginismus. Suffering from a multifactorial disorder, women with vaginismus might benefit more from a broader approach including educational sessions, relaxation exercises, systematic desensitization, home exercises and cognitive restructuring, being the coordination of a multidisciplinary team essential throughout this therapy.[5] Nevertheless, botulinum injections could also have an important role, particularly in women who have failed other types of treatment or who suffer from a severest form of vaginismus.[9,36,47,48]

With several methodological limitations found in our research, great caution should be required in the interpretation of the results.[5]

One of the limitations we have found was the lack of control groups, with most of studies being observational and comparing one intervention with another, which makes it impossible to analyse the net effect of treatment for vaginismus and to rule out a placebo effect.[8]

Also, definitional problems were commonly presented. For example, we have found diverse definitions being adopted as inclusion criteria, such as "muscle spasm interfering with vaginal penetration"[7,33,35,49], "inability to allow vaginal entry of a penis or any object despite the woman's wish"[37], "vaginal penetration difficulties"[39,50] or "unconsummated marriage"[51], with most of authors studying vaginismus and only a few mentioning GPPPD. We also found the term "expose therapy" used in several studies to explain the treatment applied[40–42], as presenting similarities with CBT, focusing exposure to feared objects, but also integrating cognitive restructuring and relaxation exercises. Some authors described the treatment applied in those studies as being behavioral sex therapy[8], but we think that addressing catastrophic cognitions resembles the treatment

applied in CBT. Thus, treatment protocols should be more descriptive in future to avoid further confusion.

Furthermore, we have found a variability in outcome variables, with successful vaginal intercourse being presented as treatments' primary outcome most of the times, although sexual functioning involves six areas strictly related with women's quality of life.[28] If successful penetration doesn't involve women's and their partners' satisfaction and pleasure, the effectiveness of the therapy might be dubious. Taking this into consideration, several authors called attention in their articles to the need of, when assessing the success of the treatment, evaluating not only the capacity to achieve intercourse, but also the quality of the sexual experience.[8,35,40] In fact, the outcome chosen can have a great impact on the results obtained as showed by Engman et al.'s article, where distinct success rates were described according to the positive treatment outcome used, with 81% of success rate considering the outcome as being able to have intercourse and 6%, considering the outcome as being able to achieve intercourse without pain and being able to appreciate it.[44]

Therefore, additional trials, including more adequate outcomes are mandatory.[8] These studies must also involve bigger samples, longer follow-up times and appropriate control groups.[29] There is an urgent need for these studies, being RCTs the gold standard when investigating the efficacy of clinical therapies.[8,52] However, conclusive evidence on vaginismus treatment might be hard to obtain, taken into account the definitional limitations and the insufficient information on its etiology.[8]

When leading with women with vaginismus, clinicians should not only be aware of the most appropriate treatments for them, as well as of the related practical issues with the treatment itself. Like health insurance restrictions or knowing that professionals with knowledge on this disorder are not always accessible far from big cities and that the costs associated with a multidisciplinary assessment and treatment involving multiple health professionals can be considerable and not affordable to many patients.[5]

An interesting question is raised by Meana et al.[5] when arguing that the "couple's stability may be balanced on the dysfunction". This is, the pain felt by the woman may hide her partner's sexual dysfunction, or even her other sexual problem. In this regard, some articles describe male sexual dysfunctions as commonly accompanying vaginismus.[49,51,53] Therefore, counselling and therapy of the partner becomes a vital concern when leading with women with vaginismus. In fact, a high motivation of the partner and the degree of its active involvement in home assignments proved to be determinant influences in the efficacy of couple's sex therapy. For this reason, it may be

beneficial to recommend surrogate therapy to patients without a permanent or participating partner. Despite its enormous cost and its ethical issues, surrogate therapy might also be a solution for women who do not want to begin a relationship before finding a resolution to their disorder, as this therapy allows women to progress to advanced treatment phases that include insertion of partner's fingers and eventually penetration.[49]

Even though the nature of vaginismus, namely primary or secondary, doesn't appear to determine its treatment's success[8], it might be useful to study them separately, because clinically total primary vaginismus, presenting usually phobic components, contrasts with partial secondary vaginismus by having many shared symptoms with chronic pain syndromes.[44] Accordingly, results found in Reissing's article showed that patients with primary vaginismus had a bigger chance to receive vaginal dilation, sex education and physiotherapy exercises, while patients with secondary vaginismus had a greater chance to receive pharmacological interventions. Reissing also found that even though women with vaginismus consulted most frequently gynecologists and family doctors, only the first ones were rated as helpful.[50] This is an important finding, as family doctors provide primary care and are the first or the only doctors some patients will have access to. As initial attempts to seek help are crucial[32], better training in this field should be offered, particularly to family doctors.

Vaginismus is a common disorder that has a substantial impact on psychosexual well-being.[4] Concerning its damaging effect on quality of life, physicians should also be alert for the fact that infertility and sexual dysfunctions may be reciprocally linked[54] and that unconsummated marriage is often the reason why couples seek for professional help, even before being aware of their sexual dysfunction.[51] Vaginismus can lead to nonconsummation of marriage since it affects the quality of intimate relationships and the capability of reproduction. Interestingly, studies presenting non-consummation of marriage as the inclusion criteria described a worse success rate.[8] The estimated delay in the diagnosis could explain this fact.

Conclusion

Women with vaginismus have been a neglected population[32], despite the fact it is widely recognized that this multicultural disorder has a great negative impact on the quality of these women's lives.[8]

After not being taken seriously, it might take years before a woman feels able to seek help again.[32] Therefore, physicians should not only know how to diagnose this disorder, avoiding years of a delayed diagnosis and its psychosocial, physical and financial costs, but also be aware of the different types of treatments their patients could benefit from. Thus, it is important to improve medical education programs on this field.

With a variety of efficacious treatments reported in the literature, CBT remains the more complete therapy described for vaginismus, targeting its multifactorial nature.[8,28] It is urgent to produce better well-designed trials on vaginismus treatment so that standardized therapeutic interventions can be developed.[8,52]

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ANEXOS

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The Journal of Sexual Medicine publishes multidisciplinary basic science and clinical research to define and understand the scientific basis of male, female, transgender, and couple's sexual function and dysfunction. As an official journal of the International Society for Sexual Medicine (ISSM) and the International Society for the Study of Women's Sexual Health, it provides healthcare professionals in sexual medicine with essential educational content and promotes the exchange of scientific information generated from experimental and clinical research.

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Contact details

EDITOR-IN-CHIEF
John Mulhall, MD, MSc, FECSM, FACS
Memorial Sloan Kettering Cancer Center
Director, Male Sexual and Reproductive Medicine Program
New York, NY, USA
jsmeditorinchief@gmail.com

If you've a question, please contact the Editorial Office:
Tim Vines, PhD
Managing Editor
jsmmanagingeditor@gmail.com

Donna Schena
Assistant Managing Editor
jsmeditorialoffice@gmail.com

Denise Gibson
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jsm@issm.info

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Reporting Checklists

Reporting Standards: Completeness and the Use of Reporting Guidelines
In an attempt to improve the quality of research reports in the journal, *The Journal of Sexual Medicine* now recommends a completed reporting guideline checklist is included with an article submission. The purpose of various reporting guidelines is to provide a guide—in the form of a checklist—to authors and editors alike on essential elements that should be included in a paper to ensure all stakeholders can properly validate results and replicate studies. We expect authors to not only use the reporting guidelines to improve the quality of reporting in their submission, but also use the associated guideline checklist to demonstrate the paper does include essential reporting criteria. Ultimately, this task is about improving a manuscript, not filling out a checklist for administrative purposes.

For Reviews and Original Research articles, authors are required to complete one of the reporting checklists listed below. This ensures a higher standard of reporting and will enhance the prospects of a manuscript being accepted for publication. Authors should upload a completed copy of the reporting checklist(s) with their submission.

STUDY TYPE	STUDY TYPE CATEGORY	CHECKLIST FOR REPORTING STANDARDS	CHECKLIST NAME
Any	—	JSM general manuscript standards	JSM Checklist
Randomized controlled pharmacotherapy trials	RCT (Pharmacotherapy)	CONSORT-Consolidated Standards of Reporting Trials	CONSORT Statement
Other pharmacotherapy and herbal medicinal trials (noninferiority trials, pragmatic trials, cluster trials, reporting of harms)	RCT (Other)	CONSORT extensions (tailored versions of the main CONSORT Statement produced by	CONSORT Checklist
Observational epidemiology studies	Observational Epidemiological Studies	STROBE-Strengthening the reporting of observational studies in epidemiology	STROBE Checklist
Qualitative Research	Qualitative Research	COREQ-Consolidated criteria for reporting qualitative research	COREQ Checklist
Diagnostic Accuracy Studies	Diagnostic Accuracy Studies	STARD-Standards for reporting diagnostic accuracy	STARD Checklist
Systematic reviews	Systematic Reviews	PRISMA (formerly known as QUOROM)-Improving the quality of reports of meta-analyses of randomized controlled trials	PRISMA Checklist
Meta-analyses of controlled trials	Meta-analysis of Controlled Trials	PRISMA (formerly known as QUOROM)-Improving the quality of reports of meta-analyses of randomized controlled trials	PRISMA Checklist
Meta-analyses of observational studies	Meta-Analyses of Observational Studies	MOOSE-Meta-analysis of observational studies in epidemiology	MOOSE Checklist
Quality improvement reports	Quality Improvement Reports	SQUIRE-Standards for quality improvement reporting excellence	SQUIRE Checklist
Erectile Function Recovery analysis following radical pelvic surgery	All relevant studies	ERF-Erectile Function Recovery Checklist	ERF Checklist

STUDY TYPE	STUDY TYPE CATEGORY	CHECKLIST FOR REPORTING STANDARDS	CHECKLIST NAME
Systematic	Systematic reviews (Pre-	PROSPERO (an international database of	PROSPERO

Reviews	registered systematic reviews will be given priority for publication)	prospectively registered systematic reviews in health and social care	Animal Studies PROSPERO Human Studies
Pre-Clinical Studies	Animal Studies	Animal Research: Reporting In Vivo Experiments	ARRIVE
JSM Guidelines for Protein Detection and PCR	JSM Guidelines for Protein Detection and PCR	JSM Guidelines + MIQE Checklist	JSM PCR Guidelines and MIQE Checklist

The Journal of Sexual Medicine expects that all prospective, randomized, controlled trials with patient enrollment starting on or after August 1, 2007, be registered in a public database that meets the requirements of the World Health Organization. Currently, such registries include the following: http://www.actr.org.au, http://www.clinicaltrials.gov, http://www.ISRCTN.org, http://www.umin.ac.jp/ctr/index/htm, and http://www.trialregister.nl.

For more information, please refer to the guidelines at http://www.icmje.org/#clin_trials. Upon submission, please provide the registration identification number and the URL for the trial's registry in your cover letter.

Cell Line Authentication

To ensure the highest standards of quality and accuracy, The Journal of Sexual Medicine strongly encourages the authentication of cell lines used in the research submitted. Manuscripts based on research using cell lines must include a statement addressing the following points in the Methods section of the manuscript:

1. Where the cells were obtained from
2. Whether the cell lines have been tested and authenticated
3. The method by which the cells were tested

If cells were obtained directly from a cell bank that performs cell line characterizations and passaged in the user's laboratory for fewer than 6 months after receipt or resuscitation, re-authorization is not required. In these cases, please include the method of characterization used by the cell bank. If the cell lines were obtained from an alternate source, authors must provide authentication of the origin and identity of the cells. This is best achieved by DNA (STR) profiling. The DNA profile should be cross-checked with the DNA profile of the donor tissue (in case of a new cell line) or with the DNA profile of other continuous cell lines.

Gene names and genetic profiling data

Please mark all gene names in italics. However, only the gene names should be written in italics, to distinguish them from gene products, gene segments, clusters, families, complexes, or groups. Authors should only use the official gene name as assigned by the respective gene nomenclature committee. Regarding comprehensive data sets of genetic profiling (microarray) studies, raw data must be in a publicly available database that requires MIAME format (for example, "GEO" or "Array Express") upon submission of a paper. Nucleotide sequence data can be submitted in electronic form to any of the three major collaborative databases: DDBJ, EMBL or GenBank. It is only necessary to submit to one database as data are exchanged between DDBJ, EMBL and GenBank on a daily basis. The suggested wording for referring to accession-number information is: 'These sequence data have been submitted to the DDBJ/EMBL/GenBank databases under accession number U12345.'

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Use of generic drug names (or generic name followed by trade name in parentheses) may be used. Include manufacturer and their location (city and country) for drugs and devices.

Statistical Guidelines

All submitted manuscripts containing data analyses will be evaluated for the integrity of the statistical methods as well as a sufficient description of the methodological approach. This will entail evaluation of the study design, statistical analysis and presentation, and interpretation of study results. As a general guideline, readers of the manuscript should be able to replicate the analysis with the same data based on the description given in the Methods section. Authors are encouraged to carefully select language in the Discussion that is appropriate given the study design and refrain from causal inferences from observational (nonrandomized) studies.

Authors should also be explicit about the limitations of the study. Failure to disclose important limitations upon submission may be grounds for rejecting the manuscript.

The editors of the *Journal of Sexual Medicine* recommend the shared set of "Guidelines for Reporting of Statistics for Clinical Research in Urology" by Assel et al [1], and adopted by four leading urology journals (*European Urology*, *The Journal of Urology*, *Urology*, and *British Journal of Urology International*). While this guideline is not indented in any way to be prescriptive, it can serve as a didactic roadmap for researchers who seek to improve the quality of their reporting of statistics in urological manuscripts before submitting them for peer-review and publication.

The following are the key considerations when reporting statistics, adapted for JSM from the "Guidelines for Reporting

of Statistics for Clinical Research in Urology" by Assel et al [1]:

1. The Golden Rule
1.1 Break any of the guidelines if it makes scientific sense to do so.

2. Reporting Of Design And Statistical Analysis
2.1 Follow existing reporting guidelines for the type of study you are reporting, such as CONSORT for randomized trials, ReMARK for marker studies, TRIPOD for prediction models, STROBE for observational studies, or AMSTAR for systematic reviews.
2.2 Describe cohort selection fully.
2.3 Describe the practical steps of randomization in randomized trials.
2.4 The statistical methods should describe the study questions and the statistical approaches used to address each question.
2.5 The statistical methods should be described in sufficient detail to allow replication by an independent statistician given the same data set.

3. Inference and *P* values
3.1 Do not accept the null hypothesis.
3.2 *P* values just above 5% are not a trend, and they are not moving.
3.3 The *P* values and 95% confidence intervals do not quantify the probability of a hypothesis.
3.4 Do not use confidence intervals to test hypotheses.
3.5 Take care to interpret results when reporting multiple *P* values.
3.6 Do not report separate *P* values for each of two different groups in order to address the question of whether there is a difference between groups.
3.7 Use interaction terms in place of sub-group analyses.
3.8 Tests for change over time are generally uninteresting.
3.9 Avoid using statistical tests to determine the type of analysis to be conducted.
3.10 When reporting *P* values, be clear about the hypothesis tested and ensure that the hypothesis is a sensible one.

4. Reporting of study estimates
4.1 Use appropriate levels of precision.
•Report *P* values to a single significant figure unless the *P* value is close to .05 (say, .01 - .2), in which case, report two significant figures. Do not report "not significant" for *P* values of .05 or higher. Very low *P* values can be reported as *P* < .001 or similar. A *P* value can indeed be 1, although some investigators prefer to report this as > .9. For instance, the following *P* values are reported to appropriate precision: < .001, .004, .045, .13, .3, 1.
•Report percentages, rates, and probabilities to two significant figures, for example, 75%, 3.4%, 0.13%.
•Do not report *P* values of 0, as any experimental result has a non-zero probability.
•Do not give decimal places if a probability or proportion is 1 (eg, a *P* value of 1.00 or a percentage of 100.00%). The decimal places suggest that it is possible to have, say, a *P* value of 1.05. There is a similar consideration for data that can take only integer values. It makes sense to state that, for instance, the mean number of pregnancies was 2.4, but not that 29% of women reported 1.0 pregnancy.
•There is generally no need to report estimates to more than three significant figures.
•Hazard and odds ratios are normally reported to two decimal places, although this can be avoided for high odds ratios (eg, 18.2 rather than 18.17).
4.2 Avoid redundant statistics in cohort descriptions.
4.3 For descriptive statistics, median and quartiles are preferred over means and standard deviations (or standard errors).
4.4 Report estimates for the main study questions.
4.5 Report confidence intervals for the main estimates of interest.
4.6 Do not treat categorical variables as continuous.
4.7 Avoid categorization of continuous variables unless there is a convincing rationale.
4.8 Do not use statistical methods to obtain cut-points for clinical practice.
4.9 The association between a continuous predictor and outcome can be demonstrated graphically, particularly by using nonlinear modeling.
4.10 Do not ignore significant heterogeneity in meta-analyses.
4.11 For time-to-event variables, report the number of events but not the proportion.
4.12 For time-to-event analyses, report median follow-up for patients without the event or the number followed without an event at a given follow-up time.
4.13 For time-to-event analyses, describe when follow-up starts and when and how patients are censored.
4.14 For time-to-event analyses, avoid reporting mean follow-up or survival time, or estimates of survival in those who had the event.
4.15 For time-to-event analyses, make sure that all predictors are known at time zero or consider alternative approaches such as a landmark analysis or time-dependent covariates.
4.16 When presenting Kaplan-Meier figures, present the number at risk and truncate follow-up when numbers are low.

5. Multivariable models and diagnostic tests
5.1 Multivariable, propensity, and instrumental variable analyses are not a magic wand.
5.2 Avoid stepwise selection.
5.3 Avoid reporting estimates such as odds or hazard ratios for covariates when examining the effects of interventions.
5.4 Rescale predictors to obtain interpretable estimates.
5.5 Avoid reporting both univariate and multivariable analyses unless there is a good reason.
5.6 Avoid ranking predictors in terms of strength.
5.7 Discrimination is a property not of a multivariable model but rather of the predictors and the data set.

5.8 Correction for overfit is strongly recommended for internal validation.
5.9 Calibration should be reported and interpreted correctly.
5.10 Avoid reporting sensitivity and specificity for continuous predictors or a model.
5.11 Report the clinical consequences of using a test or a model.
5.12 Interpret decision curves with careful reference to threshold probabilities.

6. Conclusions and interpretation
6.1 Draw a conclusion, do not just repeat the results.
6.2 Avoid using words such as "may" or "might".
6.3 A statistically significant *P* value does not imply clinical significance.
6.4 Consider sources of potential bias and the mechanism for their effect on findings.
6.5 Consider the impact of missing data and patient selection.
6.6 Consider the possibility and impact of ascertainment bias.
6.7 Do not confuse outcome with response among subgroups of patients undergoing the same treatment: patients with poorer outcomes may still be good candidates for that treatment.
6.8 Be cautious about causal attribution: correlation does not imply causation.

7. Use and interpretation of *P* values
Refer to either the full statement:
[https://www.tandfonline.com/doi/full/10.1080/00031305.2016.1154108] or the summary
[https://www.amstat.org/asa/files/pdfs/P ValueStatement.pdf] of the American Statistical Association statement on *P* values. In particular, we emphasize that a *P* value is just one statistic that helps interpret a study; it does not determine our interpretations. Drawing conclusions for research or clinical practice from a clinical research study requires evaluation of the strengths and weaknesses of study methodology, results of other pertinent data published in the literature, biological plausibility, and effect size. Sound and nuanced scientific judgment cannot be replaced by just checking whether one of the many statistics in a paper is or is not < .05.

For further information, please refer to the full paper:
[1]Assel M, Sjoberg D, Elders A, Wang X, Huo D, Botchway A, Delfino K, Fan Y, Zhao Z, Koyama T, Hollenbeck B, Qin R, Zahnd W, Zabor EC, Kattan MW, Vickers AJ. Guidelines for Reporting of Statistics for Clinical Research in Urology. Eur Urol. 2019;75(3):358-67. PMID: 30580902; PMCID: PMC6391870.

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If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

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REPORTING GUIDELINES: SANRA (STANDARDS FOR THE ASSESSMENT OF NARRATIVE REVIEW ARTICLES)

Justification of the article's importance for the readership

Page number 2: "The prevalence of vaginismus can considerably vary from 6,6%, considering a Portuguese community sample,[12] to 42%, concerning clinics with expertise in female sexual disorders.[13]" "(…) establishing its etiology can be complex.[14]".

Page number 3:"The diagnostic difficulty of vaginismus (…)."

Page number 4: "Vaginismus is a problem for many women around the world, having an important negative effect on the quality of their lives.[8] (…) every physician should be aware of this condition and recognize the most effective treatments for each of their patients."

Page number 15: "Concerning vaginismus' prevalence and its significant impact on quality of life, our goal was to clarify what can be done in terms of treatment to help women with this disorder, once no standardized therapeutic interventions have been developed.[8]"

Page number 17: "Vaginismus is a common disorder that has a substantial impact on psychosexual well-being.[4]"

Statement of concrete aims or formulation of questions

Page number 1:" (...) aiming to answer the question "What do we know on how to treat Vaginismus?", we chose consider "vaginismus" as the main topic of our work (…)"

Page number 15: "(…)our work required a bigger introduction to better understand and contextualize the results found in the literature. (…) our goal was to clarify what can be done in terms of treatment to help women with this disorder, once no standardized therapeutic interventions have been developed.8."

Description of the literature search

Page number 5: “Our revision was made utilizing Pubmed’s electronic database, with the last research made on September 7, 2020. (…) we used the following query: ((“Cognitive Behavioral Therapy”[Mesh]) AND “Vaginismus”[Mesh]) OR (“Vaginismus/drug therapy”[Mesh] OR “Vaginismus/rehabilitation”[Mesh] OR “Vaginismus/therapy”[Mesh]) OR ((“Botulinum Toxins, Type A”[Mesh]) AND “Vaginismus”[Mesh]) OR ((“Physical Therapy Modalities”[Mesh]) AND “Vaginismus”[Mesh]) OR ((“Psychotherapy”[Mesh]) AND “Vaginismus”[Mesh]) OR ((“Biofeedback, Psychology”[Mesh]) AND “Vaginismus”[Mesh]) OR ((“Surgical Procedures, Operative/therapy”[Mesh]) AND “Vaginismus”[Mesh]). (…) we excluded articles written in other language than English or Portuguese, as well as reviews. From these last 41 articles, 8 were excluded by reading their titles and abstracts, leaving 33 articles left. In a second phase, the articles were read in their full and selected according to their relevance. During this phase, 6 further articles were excluded, ending with a total of 27 articles. For each included study, the following information was obtained: title; author, year of publication, country, study type, studied population, methods used and main results/conclusions. Further relevant literature was included posteriorly, during the research of the topic.”

Referencing

Page number 6: “Not only the physical facets of vaginismus can be addressed in a dilation program, but also the psychological ones, particularly the fear and anxiety of penetration.[27,30,31]”; “According to Pacik, women usually don’t dedicate enough time to the dilation program, and for this reason they can’t achieve comfortable penetration.[3]”

Page number 7: “Dilator therapy is often described as part of a larger treatment program, such as behavioral sex therapy, CBT, expose therapy and physiotherapy.[7,33,42,34–41]”; “Physiotherapy may also include the use of electromyographic biofeedback, as a teaching tool, or transcutaneous electrical stimulation, to reduce pain through nociceptive inhibition.[37]”

Page number 8: “Involving cognitive restructuring, CBT contributes to the understanding of the thoughts and feelings influencing women’s behaviors and to the modification of their avoidance behavior and fear of penetration.[7,44]”

Page number 9: "(…) the sensate focus technique can have a crucial role in engaging in a kind of sexual retraining which focal point lies on sensuality and eliminating the pressure of performance and penetration.[5]"

Page number 10: "This study also showed a positive relation between severity of vaginismus, amount of therapy sessions required and success rate.[45]"

Page number 12: "The injection of botulinum neurotoxin into the affected muscles diminishes muscle spasms and pain.[47]"

Page number 16: "An interesting question is raised by Meana et al.[5] when arguing that the "couple's stability may be balanced on the dysfunction"."

Scientific reasoning

Page number 7 and 8: "In Yaraghi et. al's randomized clinical trial (RCT), the assessment of "physiotherapy plus electrical stimulation associated with desensitization techniques" against botulinum toxin injections, showed that physiotherapy had a higher success rate in all sexual functioning domains. (…) recommend consider physiotherapy procedures as first-line treatment for vaginismus.[28]"

Page number 10: "More promising results were found in a bigger prospective study, enrolling 120 couples (…)."

Page number 11: "(…)the efficacy of this treatment was provided by a waitlist RCT with a larger sample of 70 women, where 31 out of 35 (89%; 95% CI [72%, 96%]) patients stated they had sexual intercourse after their treatment while only 4 out of 35 (11%; 95% CI [4%, 28%]) patients in the control condition reported the same."; "(…)a pilot RCT in 2017 studied the efficacy of an "internet-based guided self-help intervention" for vaginismus."

Page number 12: "A recent systematic review and meta-analysis has shown that psychological therapies tended to improve the chance of successful intercourse (…)"

Page number 13: "A systematic review followed by meta-analysis from 2012 defended botulinum toxin as an effective approach (…)"

Appropriate presentation of data

Page number 8: "When comparing FSFI domains within group before and after intervention, there was a sexual functioning improvement in all six areas (desire, arousal, lubrication, orgasm, satisfaction and pain) in the group treated with physiotherapy, being this difference statistically significant ($p<0.001$), while there were no significant differences in the botulinum toxin injection group in the areas of desire ($p=0.79$) and lubrication ($p=0.96$)."

Page number 9: "The authors also described "married by matchmaker without consent" (OR = 0.060, CI = 0.046–0.771, P = 0.031) and "not allowing pelvic examination" (OR = 0.124, CI = 0.016–0.941, P = 0.044) as negative predictors (…)."

Page number 10: "Another finding of the study was the correlation between (…), being "the difference between groups of less than 2 years and more than 2 years [of unconsummation] ($p < 0.01$) and between 2 to 3 years and 3 to 10 years ($p < 0.05$) significant (Chi-square)"."

Page number 11: "(…) the efficacy of this treatment was provided by a waitlist RCT with a larger sample of 70 women, where 31 out of 35 (89%; 95% CI [72%, 96%]) patients stated they had sexual intercourse after their treatment while only 4 out of 35 (11%; 95% CI [4%, 28%]) patients in the control condition reported the same"; "(…) the between-group difference detected at 6-month after follow-up was statistically significant, favoring the IG ($F_{1,48} = 9.26$, $P < .01$, $d = 0.56$)."

Page number 12: "(…) psychological therapies tended to improve the chance of successful intercourse, even though this change is not significative (OR 10.27 [95% CI 0.79-133.5], P = 0.075)."

Page number 13: "(…) the use of botulinum toxin significantly increases the chance of patients to respond to vaginismus treatment (pooled odds ratio of 8.723 (95% CI 1.942–39.162) reaching z = 2.827 and p = 0.005).[48]"