

Research Article

Effects of a Physiotherapeutic Intervention on Coital Pain

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Abstract

The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) defines coital pain as discomfort during sexual intercourse that can be classified as vaginismus or dyspareunia.

Objectives: To evaluate the effectiveness of physiotherapeutic interventions on genito-pelvic/penetration pain (vaginismus and dyspareunia) and to determine the impact of this intervention on the risk of anxiety and depression, and sexual dysfunction in women with this condition.

Methods: This controlled and non-randomized clinical trial examined 11 women with dyspareunia and 5 women with vaginismus who were referred to Ambulatório de Estudos em Sexualidade Humana (AESH) of the Department of Gynecology and Obstetrics of the Medical School of Ribeirão Preto, University of São Paulo. The baseline level of pain was determined using a Visual Analogue Scale (VSA) and the McGill Pain Questionnaire (MPQ). Sexual function was assessed using the Index of Female Sexual Function (IFSF). The Hospital Anxiety and Depression Scale was used to track signs of anxiety (HADS-A) and depression (HADS-D). Functional and pelvic floor muscle tone was assessed using the modified Oxford Grading Scale (OGS). The physiotherapeutic intervention consisted of general guidelines (emphasizing the importance of visualization of the pelvic floor muscles and body perception) followed by self-relaxation with an emphasis on proprioception, passive stretching of the adductor muscles of the hip, and intravaginal massage.

Results: A total of 81% of the women had a risk for sexual dysfunction and 44% had a risk for anxiety. There were significant improvements ($p < 0.05$) in all outcome measures from the initial assessment to the period immediately after treatment, and from the initial assessment to 6 months after treatment. There was a strong positive correlation between IFSF score and OGS score, and strong negative correlations between IFSF score and MPQ score and between HADS-D score and OGS score.

Conclusion: Physiotherapeutic treatment effectively reduces coital pain, improves sexual function, and helps reduce anxiety and depression in women with dyspareunia and vaginismus.

Keywords: Physiotherapy; Coital Pain; Intravaginal Massage; Vaginismus; Superficial Dyspareunia

Introduction

Pain during sexual intercourse affects about 15 to 20% of American women who are 18 to 64 years-old [1]. Similarly, a Brazilian study of 3148 women reported the prevalence of pain during sexual relations was 17.8% (ABDO, 2004). Coital pain has a negative impact on the quality of life, because it interferes with a woman's sexual function and can lead to emotional suffering and relationship problems [2].

Multiple factors could be responsible for genito-pelvic/penetration pain. Thus, treatment of this condition may require interdisciplinary interventions, depending on the causal factor. For women who have hyperactivity and hypertonia of the pelvic floor muscles, previous research indicated that physiotherapeutic interventions provided good results in that they reduced dysfunction of these muscles, a condition that was secondary to gynecological diseases [3].

Several physiotherapy methods are used to treat pelvic floor dysfunctions that may be related to genito-pelvic/penetration pain:

(i) improving body perception and use of vaginal dilators, pelvic and perineal exercises, biofeedback, and electro stimulation to normalize pelvic floor muscle tone, improve contractile activity, increase muscle strength, and reduce pain [4,5], (ii) osteopathy techniques involving visceral and urogenital manipulation to improve tissue mobility; (iii) use of rehabilitation, consisting of pelvic floor muscle exercises and cognitive behavioral therapy to reduce pain and improve the sexual response [6], and (iv) vaginal desensitization and intravaginal massage to normalize tone and reduce pain. In general, massage leads to stimulation of proprioceptive nerve endings, and promotes the release of enkephalins and endorphins, hormones that are responsible for the sense of pleasure and satiety, and reduce pain. The stretching of muscular-tendinous structures during massage triggers reflex relaxation via stimulation of the Golgi tendon organs and striated receptors, leading to increased local blood flow and removal of cellular metabolites, resulting in normalization of muscle tone [7]. This technique is beneficial for rehabilitation of pelvic muscles, has

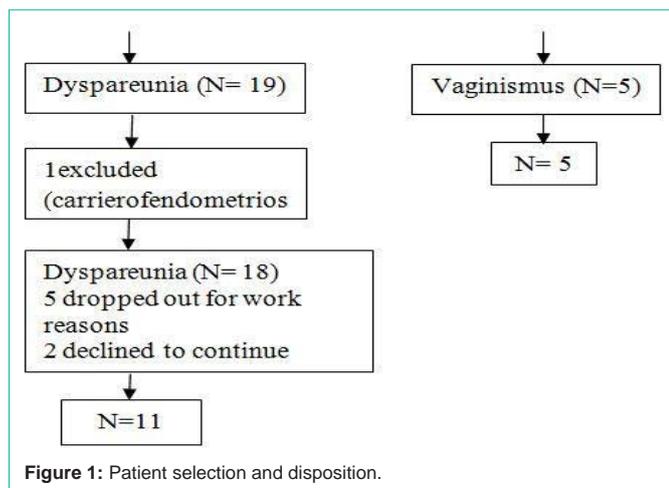


Table 1: Characteristics of the study population (N = 16).

Variable	Mean ± SD (Min–Max)
Age (years)	33.69±12.14 (21-65)
Weight (kg)	66.28 ±12.31 (48-89)
Height (cm)	1.63 ±0.05 (1.5-1.69)
BMI (kg/m ²)	25.21 ±5.11 (18.07-33.78)
Complaint duration (months)	63.69 ±68.81 (5-240)
No. partners	2.06 ±1.77 (1-8)
No. children	1.00 ±1.41 (0-4)
No. physiotherapy sessions	7.94 ±3.99 (4-16)
Duration of relationship (months)	81.13 ±79.42 (12-324)

Abbreviations: BMI, Body Mass Index; SD, Standard Deviation; Min, Minimum; Max, Maximum.

low cost, and is risk-free [8].

The objective of this study was to evaluate the effectiveness of physiotherapeutic interventions on genito-pelvic/penetration pain (vaginismus and dyspareunia) and to determine the impact of this intervention on the risk of anxiety and depression, and sexual dysfunction in women with this condition.

Methods

This was an uncontrolled and non-randomized clinical trial of

Table 2: Characteristics of women with dyspareunia and vaginismus.

Variable	Dyspareunia (N=11)	Vaginismus (N=5)
	Mean±SD (Min–Max)	Mean±SD (Min–Max)
Age (years)	36.73±13.65 (21-65)	27±2.35 (23-29)
Weight (kg)	66.58±13.14 (51-89)	65.60±11.67(48-79)
Height (cm)	1.63±0.06 (1.5-1.69)	1.63±0.03 (1.60-1.68)
BMI (kg/m ²)	25.45±5.49 (18.73-33.78)	24.68±4.70 (18.07-30.86)
Complaint duration (months)	67.55±82.30 (5-240)	55.20±26.29 (24-96)
No. partners	2.55±1.97 (1-8)	1±0 (1-1)
No. children	1.45±1.51 (0-4)	0±0 (0-0)
No. physiotherapy sessions (maximum of 16)	6.36±3.56 (4-16)	11.40± 2.41 (9-14)
Duration of relationship (months)	89.64±94.23 (12-324)	62.40±28.65 (24-96)

BMI: Body Mass Index.

16 women with genito-pelvic/penetration pain (11 with dyspareunia and 5 with vaginismus) who were referred to the outpatient clinic of Human Sexuality of the Department of Gynecology and Obstetrics at the Medical School of Ribeirão Preto, University of São Paulo.

All women were between 18 and 65 years-old who were sexually active with partners, and treated or not treated with hormone replacement therapy were eligible. We excluded women who were pregnant, had vaginal or untreated urinary tract infections, had genital prolapse of at least grade III, had histories of degenerative neurological disease, had chronic pelvic pain, used muscle relaxants or antidepressants, received previous treatment consisting of nerve blockade with an anesthetic, and had cognitive limitations.

Women were consecutively enrolled from January 2014 to May 2016, and were all evaluated individually by a trained physiotherapist (H.A.S.P.). Before evaluation, all testing and physiotherapeutic procedures to be used were explained. Women who agreed to participate were evaluated after signing the informed consent document. This project was approved by the Research Ethics Committee of our institution, and all participating women signed informed consent documents.

Prior to beginning the therapeutic protocol, the women answered two questionnaires to evaluate pain: a pain Visual Analogue Scale (VAS) and the McGill Pain Questionnaire (MPQ) [9-11]. We also assessed sexual function using the Female Sexual Function Index (FSFI) [12], and the risk for anxiety and depression using the Hospital Anxiety and Depression Scale (HADS) [13]. Then, functional evaluation of pelvic floor muscle tone was determined using intravaginal digital palpation, and the results were scored by the modified Oxford Grading System (OGS). The intervention protocol first provided an educational background, and then taught specific procedures. Thus, women were first shown a color illustration of the vulva, vagina, and pelvic floor muscles (PFMs). The women were taught the location and function of the PFMs, and about the muscular groups that would be treated. These explanations were intended to make women aware of their own anatomy and physiology, and to improve treatment efficacy, because 30% of women have difficulty recruiting their PFMs [14,15].

The specific procedures were: (i) self-relaxation and anxiety control, designed to improve body perception and breathing control; (ii) desensitization to promote self-knowledge, in which women are

Table 3: Number and percentage of women at risk of sexual dysfunction, anxiety, and depression before treatment (time-0), immediately after treatment (time-1), and six months after treatment (time-2) (N = 16).

Outcome measure	Women at risk		
	Time-0	Time-1	Time-2
	N (%)	N (%)	N (%)
FSFI	13(81)	5 (31)	4 (31)
HADS-A	7(44)	4 (25)	5 (38)
HADS-D	4(25)	2 (13)	1 (7.7)

Abbreviations: FSFI, Female Sexual Function Index; HADS-A, Anxiety Scale; HADS-D, Depression scale

encouraged to visualize and identify the clitoris, outer lips, inner lips, and vaginal introitus in a mirror and touch these regions, (iii) passive bilateral stretching of the thigh adductor muscles, performed within the normal range of motion and at low intensity with long duration (60 s); (iv) perineal or intravaginal massage, performed manually while in the gynecological position with stirrups (initially described by Thiele in 1937 [16], to deactivate trigger points and promote relaxation of the levatorani muscle [8].

Intravaginal massage was performed as described previously [17]. This procedure stretched the muscle at the insertion of the PFM, towards the muscle fibers, with tolerable pressure for 5 min on the right side and 5 min on the left side. Women performed 4 to 16 treatments per week, with each treatment lasting approximately 40 min. We advised women with dyspareunia not to interrupt sexual intercourse during the treatment period, because their performance and possible difficulties would help to evaluate changes.

Statistics

Data are presented as means and standard deviations (quantitative variables) or as absolute and relative frequencies. Spearman's correlation coefficient was used to assess the correlation between clinical measures at baseline. A mixed effects linear regression model was used to determine the significance of clinical measures at different times. This model was implemented in the SAS version 9.3. A p-value below 0.05 was considered significant.

Table 4: FSFI, HADS-A, HADS-D, MPQ, and pain VAS scores before treatment (time-0), immediately after treatment (time-1) and six months after treatment (time-2) (N = 16).

Outcome measure	Time-0	Time-1	Time-2	Time-0	Time-0 vs.	Time 1
	Mean ± SD	Mean ± SD (Min–Max)	Mean ± SD (Min–Max)	vs. Time-1	Time-2	vs.
	(Min–Max)			P	P	Time-2
FSFI	21.17±6.22 (9.30-32)	26.96±7.56 (4.20- 34.80)	27.15±7.66 (9.30-34.8)	0.0007	0.0011	0.9219
HADS-A	8.88±4.87 (0-18)	7.19±4.28 (2-16)	6.69±3.95 (2-16)	0.0349	0.0268	0.7781
HADS-D	5.69±4.08 (1-14)	4.25±3.55 (1-13)	4.23±3.06 (2-12)	0.0165	0.0021	0.3079
MPQ	20.75±8.46 (9-34)	9.31±8.93 (0-32)	7.85±11.35 (0-38)	0.0007	0.0005	0.6741
Pain VAS	7.19±2.14 (3-10)	2.44±2.58 (0-8)	1.69±2.06 (0-6)	<.0001	<.0001	0.4116

Abbreviations: MPQ, McGill Pain Questionnaire; VAS, Visual Analogue Scale.

Results

We invited 25 women to participate in this study. One refused to participate, and 24 were initially included, 19 with dyspareunia and 5 with vaginismus. Sixteen of these women completed the study (Figure 1).

Table 1 shows the characteristics of the study population. In addition, 8 women (50%) were Catholic, 7 (43%) completed high school, 6 (38%) had education beyond high school, and 3 (19%) only had a primary school education.

All women with vaginismus had this condition for at least 24 months, and these women completed more physiotherapy sessions than women with dyspareunia (Table 2).

Table 3 shows the number and percentage of women at risk of sexual dysfunction (based on FSFI score ≤ 26.55), anxiety (based on HADS-A score), and depression (based on HADS-D score) before the intervention, immediately after treatment, and six months after treatment. The number of at-risk women on all 3 of these scales declined significantly over time.

We also compared the scores on the different outcome measures (FSFI, HADS-A, HADS-D, MPQ, and pain VAS) before treatment (time-0), immediately after treatment (time-1), and six months after treatment (time-2). The results indicate significant improvements in all 5 scores between time-0 and time-1 and between time-0 and time-2, especially in the pain VAS (Table 4).

Table 5 shows there were significantly positive correlations between the FSFI and OGS scores. There were significantly negative correlations between the FSFI and MPQ scores and between the HADS-D and OGS scores

Discussion

Our results highlight the effects of a protocol used for the physiotherapeutic treatment of coital pain, which consists of education about the functions of pelvic floor muscles followed by vaginal desensitization, with encouragement of visualization and manual massage. These techniques of self-relaxation using

Table 5: Correlation between different outcomes measures (FSFI, HADS-A, HADS-D, MPQ, pain, VAS, and modified OGS) for scores at time-0.

		FSFI	HADS-A	HADS-D	MPQ	Pain VAS	OGS
FSFI		1					
HADS-A	Corr	-0.3905	1				
	P	0.1348					
HADS-D	Corr	-0.4274	0.39492	1			
	P	0.0987	0.1301				
MPQ	Corr	-0.5398	0.25333	0.132	1		
	P	0.0309	0.3438	0.626			
Pain VAS	Corr	0.01945	-0.1773	-0.1006	0.42251	1	
	P	0.943	0.5112	0.7108	0.103		
OGS	Corr	0.64204	-0.3307	-0.5134	-0.3486	0.1381	1
	P	0.0073	0.2109	0.0419	0.1858	0.61	

Abbreviations: Spearman's correlation coefficient; OGS; Oxford Grading System.

respiratory exercises, passive stretching of the adductor muscles of the hip and intravaginal massage effectively reduced coital pain, as indicated by the lower scores on the pain VAS and the MPQ after treatment. Our findings corroborate the results of a series of cases reported by Weiss. This previous study examined 31 women with spasm of the pelvic floor muscles secondary to interstitial cystitis and urgency syndrome, in which 19 patients (61.3%) reported total remission of symptoms and 11 (35.5%) reported reduced pain during sexual relations after treatment consisting of intravaginal massage and digit pressure for trigger point deactivation. In this series of cases, the authors used different intervention groups (interstitial cystitis and urgency syndrome), there were 7 male research volunteers, and they employed a different methodology; manual therapy was effective in reducing PFM tonus and pain during sexual intercourse for the group with coital pain secondary to interstitial cystitis. Other studies also suggest that physical therapy can reduce coital pain [3,8,18,19]. On the other hand, a retrospective study conducted through telephone interviews that examined the effectiveness of physiotherapy in reducing coital pain showed that the participants were very satisfied with the treatment, although some symptoms remained after treatment, such as pain, anxiety/fear, tension in the pelvic floor, and impaired sexual function. This suggests that physical therapy may be a promising treatment option for some women with vaginismus, but more thorough evaluation is needed before this method is widely applied [20]. However, the authors of this retrospective study did not have full access to the physical therapist's charts, which made it impossible to analyze the exact protocols that were used. It should be emphasized that the present study used the same evaluation instruments at 3 different times and confirmed improvements of all parameters immediately after treatment and after 6 months. We scored the absence of pain as 0/10 and minimal discomfort as 1 or 2/10 using a VAS, and also confirmed the effectiveness of the protocol using the MPQ. In fact, there was a significantly positive correlation between the scores on these 2 instruments, thus confirming the efficacy of the physiotherapeutic intervention in reducing coital pain.

Coital pain is rarely psychogenic alone, and several factors, mainly psychosexual factors, can lead to hypoactive sexual desire, sexual arousal disorders, and related conditions [2]. Our analysis of FSFI

and HAD Scores showed a significant reduction in the proportion of women at risk for sexual dysfunction, anxiety, and depression after the physiotherapeutic treatment in the study population. Silva et al. 2016, reported similar results. They evaluated the efficacy of perineal massage in 18 women with spasm-induced dyspareunia in the PFMs in 2 groups of women: 10 women with dyspareunia caused by spasms in PFMs secondary to chronic pelvic pain and 8 women with dyspareunia caused only by spasm in the PFMs. The group of women with spasm-induced dyspareunia in the PFMs had improvement in all parameters related to sexual function, but not in measurements of anxiety and depression, in contrast to the results of the present study. There may be several reasons for this difference. First, [8], limited the number of interventions to 4 sessions, but we allowed 16 sessions. Second, we included self-relaxation and anxiety control techniques in our protocol, but Silva et al., 2017 did not. Third, we employed desensitization to expose the woman to anxiogenic situations, to allow management of anxiety, pain, and conditioned response of the vagina muscles, but Silva et al., 2017 did not. In addition, we instructed the women not to interrupt intercourse during treatment period, so they could learn to manage difficulties and possible anxiogenic factors during intercourse at the next treatment session. We believe that these differences contributed to the long-term reduction of anxiety and depression of the women in our study. Our study also confirms that coital pain has a negative effect on sexual function, as indicated by the strong inverse correlation between the MPQ and FSFI scores. Previous studies showed that fear of coital pain increase the risk for anxiety, and that this exacerbated coital pain and worsens sexual function [21,22].

We also found a strong positive correlation between the OGS score and FSFI score, indicating a positive association between PFM function and sexual function. This was previously reported by [23], and [22], who concluded that improved PFM function correlated with improved sexual function in women of reproductive age [24]. Examined the effect of training of the PFMs on the sexual function and use of humor in postmenopausal women who were continent. They concluded that an improved PFM function significantly reduced anxiety, but had no impact on sexual function and depression. This previous result may differ from the results of the present study due differences in the study populations. Lara et al. studied continent women, which suggests that they did not present with dysfunctional PMFs, and all the women in their study were postmenopausal, a condition that, in itself, is associated with mood disorders and sexual dysfunction [24]. Two unique findings in the present study are the strong inverse correlations between PMF function and HADS-D, and between PMF function and anxiety. This indicates that PFM dysfunction is related to anxiety and depression.

The present study is limited in that the sample size was small, making multidimensional analysis impossible. In fact, our calculation indicated the need to enroll 30 women to guarantee a test power of 99%. The total sample consisted of 25 women, 16 of whom completed the protocol. Our small sample size is related to the difficulties in performing an intervention study that employs intravaginal massage, due to difficulties related to possible feelings of shame and religious beliefs [25].

Conclusion

Our results indicate that a physiotherapy treatment effectively

reduced coital pain, and reduced the risk for sexual dysfunction, as well as for anxiety and depression in women with dyspareunia and vaginismus.

Future Perspectives

Future randomized and controlled trials are needed to confirm our results. These studies should include women with dyspareunia and vaginismus, employ randomization to different physiotherapeutic intervention groups, examine the relationships of physiotherapy with psychotherapy, and enroll an appropriate control group. It is also necessary to control for variables that interfere with female sexual function, such as emotional factors and PFM function.

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