

# Spinal Anesthesia-facilitated Sexual Intercourse as a Treatment Option for Refractory Vaginismus and its Effect on Female Sexual Dysfunction, Penetration Cognition, and Coital Pain

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## ABSTRACT

**Objective:** To evaluate the role of spinal anesthesia facilitated sexual intercourse under controlled conditions in couples with vaginismus and its effect on female sexual function, penetration cognition, and pain.

**Methods:** A cross-sectional comparative study was carried out from January 2017 to December 2019. For this study, we included women who had been married for 2 years but had not consummated their marriage due to vaginismus. The primary outcome measure in this study was successful sexual intercourse. Secondary measures included improvement in female sexual function, penetration cognition, and pain.

**Results:** During the study period, 10 couples satisfied the inclusion criteria. Vaginismus continued in only one couple at the 12-month follow-up. The sexual function changed significantly ( $p = 0.005$ ). Penetration cognition score domains improved significantly at follow-up. The pain for tampon insertion score dropped significantly from 9.20 (8.0–10.0) to 5.20 (4.00–7.00),  $p = 0.005$  on the first follow-up. The coital pain had a significant drop from the initial score of 9.20 (8.0–10.0) to 2.1 (1.00–3.00),  $p = 0.004$ . Five out of the 10 couples were pregnant at the final follow-up, and three delivered vaginally.

**Conclusion:** Our comparative study shows that spinal anesthesia can be used as a last resort management option in women suffering from vaginismus.

**Keywords:** Female sexual function, Spinal anesthesia, Vaginismus.

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## INTRODUCTION

Nonconsummation of marriage can be due to fear of sexual pain. Painful sex is common; global estimates in premenopausal women of 41%.<sup>1</sup> Recently, the use of "genito-pelvic pain/penetration disorder" has been proposed instead of dyspareunia and vaginismus (involuntary spasm of the musculature of the vagina).<sup>2</sup>

Vaginismus has two variants; a lifelong variant and an acquired variant; in the lifelong variant, a woman has never been able to have coitus, whereas, in the acquired variant, she becomes symptomatic after a symptom-free period and loses her ability to have coitus.

Vaginismus can be due to many reasons; however, no definite cause has been implicated to date. It is more common in conservative societies.<sup>3</sup>

Vlaeyen and Linton<sup>4</sup> proposed a fear-avoidance model, and using that model was used to propose a model for vaginismus.<sup>5</sup> This model basically explains the penetration problems that develop in women due to fear and pain. They may even become hypersensitive or have exaggerated responses to sensations. These responses are sometimes coupled with defensive muscle contraction, which leads to increased difficulty and pain in further penetration attempts. The vicious cycle of vaginismus is thus perpetuated with every attempted act. Spinal anesthesia blocks all sensory and motor pathways and can help overcome involuntary spasms under controlled conditions.<sup>6</sup> It can be offered as a last resort management option in selected cases where the problem is of long duration and is not resolved by other forms of treatments.<sup>7</sup>

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Vaginismus is a multidimensional problem, and its effects on pain, penetration, cognition, and satisfaction need to be assessed for any proposed treatment option. The tampon test is commonly utilized to ascertain pain as an outcome measure. The female sexual function index (FSFI) questionnaire is a tool for the assessment of sexual function. The questionnaire has been translated and validated in many languages.<sup>8</sup> Rehman et al.<sup>9</sup> proved that it has the potential to serve as a perfect tool in conservative societies due to its modest but explicit expressions.

Depression and relationship quality are closely associated with physical intimacy. A study showed that lack of sex leads to varying

degrees of depression in couples, and relationship quality is also deeply affected.<sup>10</sup>

Zung's depression scale is a self-reported measure of depression and has been used to assess depression in a variety of cases.<sup>11</sup> Similarly, the relationship assessment scale<sup>12</sup> is used to assess the quality of the relationship.

Women with vaginismus have fears, apprehensions, and issues with genital incompatibility. We anticipated that women would have improved cognition of vaginal penetration, albeit at a subconscious level. We hypothesized that spinal anesthesia could lead to successful intercourse in these women, and the effect may persist in the future. They would be able to have some idea about the lack of genital incompatibility, penetration, and pain components. Even if the woman is anesthetized, the relief that they have normal anatomy and that penetration was possible would provide relief. After that, repeated exposure from the husband would resolve the issue. Although women would be anesthetized, the cognitive dimension of the problem would be resolved. Over the course of time, and with repeated attempts from the husband, the problem would be resolved.

The aim of this study was to evaluate the role of spinal anesthesia facilitated sexual intercourse under controlled conditions in resolving vaginismus and improving vaginal penetration cognition questionnaire (VPCQ), pain scores, and FSFI. Secondary outcomes included the effect of spinal anesthesia facilitated sexual intercourse on depression and relationship quality as assessed by Zung's self-reported depression scale and relationship assessment scale, respectively.

## METHODS

### Study Design

A pre/postintervention design study was carried out from January 2017 to December 2019.

### Participants

For this study, we included women who had been married for 2 years but had not consummated their marriage due to vaginismus. Vaginismus was defined as involuntary contraction and spasm of the outer third of the perineum. Nonconsummation of marriage was defined as the inability to perform successful sexual intercourse after marriage. Excluded from the study were women whose partners had erectile dysfunction, women with vulval skin conditions, infections of the vulva/vagina or urinary infection, and endometriosis.

The couple was interviewed to explore the root cause. Guidance about the correct method of intercourse was offered. The use of lubricants and digital dilation was encouraged.

After we obtained written and informed consent, we scheduled all couples who met the inclusion criteria for psychiatric counseling. The counseling involved structured sessions for the couple where all treatments were tried. If, after trying for 6 months, they failed to have sexual intercourse, the couple was enrolled for intercourse under spinal anesthesia.

### Intervention

In our study, a trained anesthetist administered spinal anesthesia using an aseptic technique. For the study purpose, an intravenous line was maintained with a 20-gauge intravenous cannula, and the patient was loaded with 0.9% saline. Noninvasive monitoring for blood pressure and pulse was done. Using the median approach, intrathecal space was accessed by a 25-gauge Quincke bevel (Becton Dickinson) through L4-L5. We used 5 milligrams

of hyperbaric bupivacaine (abocain 0.5%/Abbot) to block. The anesthetist monitored the block height by pinprick test after every 3 minutes for 20 minutes until there was no progression. Then the couple was allowed some privacy. They were trained and explained precautions beforehand.

In the recovery room, the couple was instructed to get comfortable with the digital penetration; the anesthesia had an effect that made this pain-free.

Postprocedure counseling was provided to the couples to ensure they do not rush things at home and take them at a sustained pace. They were encouraged to have at least digital penetration daily and then progress to penile tip only. Women with vaginismus have an intense fear of penetration, and men are also sensitive at this fragile juncture. Once the female was comfortable with penetration of the penile tip, full penetration was allowed. However, thrusting was still discouraged. To overcome the leg lock women with vaginismus experienced at penetration, the spooning position was encouraged. The couple was also encouraged to try different positions that they found more comfortable. Follow-up was maintained for a 6-month period initially.

A pro forma was used to collect the data. The performance included sociodemographic details like the age of spouses, duration of marriage, residence, and education.

We asked the participants the following closed-ended questions: "Have you had sexual intercourse with your partner, including full penile penetration of the vagina?" The answers were rated as follows: (1) no attempt to have sex (coded 0), (2) attempted to have sex but did not have full penetrative sex with partner's penis (coded 0), and (3) I attempted to have sex and had full penetrative sex with partner's penis (coded 1). Using these answers, we derived an outcome score (yes/no, where 1=yes and no=0) for the study period, which was our primary outcome measure.

### Secondary Measures

#### Satisfaction Measure

We used an FSFI questionnaire that comprised 19 questions to assess sexual feelings and responses. The domain scores are computed by adding the score of items that constitute the domain. The sum is then multiplied by the domain factor.

#### Penetration Measures

The 22-item VPCQ measures cognitions regarding vaginal penetration in women. All items were rated on a 6-point Likert scale.

#### Pain Measures

Using a numeric rating scale, women were asked to rate their level of pain after Spinal facilitated intercourse at their follow-up at 6 months and 12 months for two pain measures. We report data as mean–standard deviation (SD) for each of the pain measures.

**Tampon test:** We used the tampon test to assess coital pain because some women completely avoid sex for fear of pain. We gave each woman standard tampons and asked her to insert a tampon without lubrication and remove it immediately after inserting it and grade their pain on the pain scale. We asked our participants to use Original Regular Tampax Tampons (Proctor & Gamble Corp) and not use any other tampons.

**Coital pain:** Subjects reported their level of pain on a numeric scale, to rate their level of pain.

The females were administered the FSFI questionnaire before and after the intervention. The scores were compared

across domains before and after an intervention. For penetration measures, VPCQ was administered before treatment, 3 monthly follow-up, and 6 monthly follow-up. The pain was assessed using the tampon test and coital pain measure at the 3 monthly and 6 monthly follow-ups.

The primary outcome measure in this study was successful sexual intercourse. The improvement in FSFI, VPCQ score and pain score were used as measures to assess the effectiveness of the intervention and were the secondary measures. The couple was administered two questionnaires (1) Zung's self-rating depression scale (SDS) and (2) a relationship assessment questionnaire. Both scales were administered twice, before and after the treatment, and were additional measures.

All participants provided informed consent. The study was approved by the Institutional Ethics Committee (IEC/AZIZ/003/2016). No subjects were harmed, confidentiality was maintained, and no subject was enrolled in the study without formal informed consent.

### Statistical Analysis

Data was entered and analyzed using Statistical Package for Social Sciences (SPSS) version 15. Shapiro–Wilk's test was used to assess the normality of data distribution. The quantitative variables age of spouses, duration of the marriage, SDS before and after treatment, and renin-angiotensin-system before and after treatment were presented by medians and range. Frequency and percentages were computed for qualitative variables; education and area of residence. The chi-squared test and Fischer's exact test were used to compare these variables at  $p < 0.05$  level of significance.

Wilcoxon signed-rank test was used to compare FSFI (before and after intervention), VPCQ (initial with 6 monthly follow-up; initial with 12 monthly follow-up), and pain scores (initial with 6 monthly follow-up; initial with 12 monthly follow-up) Wilcoxon signed-rank test was used to compare the individual's SDS and RAS. SPSS version 15.0 (SPSS Inc., Chicago, Illinois, United States of America) was used for all statistical analyses.

### RESULTS

Over the study period, 124 women satisfied the inclusion criteria and were invited to participate, and eight refused to participate. Of the 116 included, 46 had nonconsummation of marriage due to vaginismus, giving a frequency of 39.65%.

Of the 46 women, 11 women did not improve with all methods and were enrolled for sexual intercourse under anesthesia. A couple was non-compliant with follow-up, and 10 couples were taken into consideration.

The characteristics of the study sample are shown in Table 1. Vaginismus continued in three couples at the 3 months follow-up and only one couple at the 6-month follow-up (Table 2). Five out of 10 women were pregnant at the 1-year follow-up. One woman who remained symptomatic had an intense fear of penetration and was undergoing psychiatric counseling with her husband. Of the women who conceived, one had a miscarriage at 4 months, and the other four delivered at term. Three were delivered vaginally, and the fourth was delivered *via* cesarean section. The reason was a fetal compromise. The women did report fear of childbirth, but that did not stop them from attempting normal vaginal childbirth.

Vaginal penetration cognition questionnaire (VPCQ) domains improved significantly after intervention at the first follow-up and showed a statistically significant improvement at the second follow-up as well (Table 2).

The pain for tampon insertion score dropped significantly from 9.20 (8.0–10.0) to 5.20 (4.00–7.00),  $p = 0.005$  on the first follow-up. The coital pain also showed statistically significant improvement at both follow-ups (Table 2).

The FSFI changed significantly in all women ( $p = 0.005$ ) (Table 3).

The SDS scores decreased significantly in both males ( $p$ -value = 0.005) and females ( $p$ -value = 0.004). The relationship assessment score also increased significantly in both males ( $p$ -value=0.005) and females ( $p$ -value=0.005) (Table 4).

## DISCUSSION

### Main Findings

Our study shows that spinal anesthesia facilitated sexual intercourse is an effective treatment option in cases of vaginismus. Vaginismus did not continue in any couple except one. It improved vaginal cognition and penetrative scores and also improved pain scores. It improved FSFI in women and improved both depression and relationship quality in couples. The FSFI improved from 15.95 (range 10.10–21.40) to 33.15 (range 27.90–35.30),  $p = 0.005$ .

Depression score improved significantly after intervention in males (median score of 34 vs 26) and females (median score of 57 vs 28)

Relationship assessment scores also improved significantly.

**Table 1:** Characteristics of study population

Characteristic	
Age in years (Male)	31 (26–35)
Age in years (Female)	26 (21–31)
Duration of marriage in years	3 (2–7)
Referral	
Self	2 (20%)
Psych	3 (30%)
Other gynecologists	2 (20%)
Family doctor	3 (30%)
Desire to have a kid (yes)	7 (70%)
Previous treatment from	
Any professional	10 (100%)
Psychiatrist	6 (60%)
Sexologist	5 (50%)
Physical therapist	6 (60%)
Medical doctor	8 (80%)
Alternative healer	4 (40%)
Level of education (Male)	
Primary	1 (10%)
Secondary	7 (70%)
Illiterate	2 (20%)
Level of education (Female)	
Primary	5 (50%)
Secondary	3 (30%)
Illiterate	2 (20%)
Area of residence	
Urban	6 (60%)
Rural	4 (40%)

**Table 2:** Vaginal pain and cognition questionnaire domains during follow-up

	<i>Pretreatment</i>	<i>6 months follow-up</i>	<i>p-value*</i>	<i>12 months follow-up</i>	<i>p-value*</i>
Successful coitus <i>n</i> (%)	0/10	7/10 (70%)		9/10 (90%)	
VPCQ domains:					
Control	19.40 (17.00–22.00)	11.40 (10.00–14.00)	0.005	1.00 (0.00–2.00)	0.005
Catastrophe and pain	24.60 (22.00–28.00)	13.30 (11.00–17.00)	0.005	0.5 (0.00–5.00)	0.005
Self-image	27.6 (25.00–33.00)	19.10 (16.00–24.00)	0.004	6.4 (6.00–10.00)	0.005
Positive	5.3 (1.00–8.00)	21.40 (20.00–24.00)	0.005	28.4 (27.00–30.00)	0.005
Genital incompatibility	8.7 (7.00–11.00)	3.60 (3.00–5.00)	0.005	0.30 (0.00–1.00)	0.005
Pain measures					
Pain (tampon)	9.20 (8.0–10.0)	5.20 (4.00–7.00)	0.005	2.1 (1.00–3.00)	0.004
Coital pain	9.7 (9.00–10.00)	3.6 (2.00–5.00)	0.005	2.3 (1.00–3.00)	0.004

Data reported as median (range); \*Wilcoxon signed-rank test used to compare pretreatment score with the score at follow-up

**Table 3:** Female sexual function index pretreatment and posttreatment

<i>Domain</i>	<i>Female sexual function index</i>		<i>p-value*</i>
	<i>Pretreatment point 0</i>	<i>(Posttreatment) Study follow-up 12 months</i>	
Desire	3.72 (1.80–4.80)	5.52 (4.20–6.00)	0.005
Arousal	3.45 (1.50–4.80)	5.40 (4.50–6.00)	0.005
Lubrication	2.70 (1.50–3.90)	5.46 (4.80–5.70)	0.005
Orgasm	2.68 (1.60–4.00)	5.45 (4.80–6.00)	0.003
Satisfaction	2.24 (1.60–4.00)	5.84 (5.20–6.00)	0.001
Pain	0.60 (0.00–1.20)	5.10 (4.40–6.00)	0.002
FSFI (sum)	15.39 (10.10–21.40)	32.77 (27.90–35.30)	0.005

Data reported as median (range); \*Wilcoxon signed-rank test used to compare pretreatment score with the score at follow-up

**Table 4:** Self-reported depression score and relationship assessment score in males and females (pretreatment vs posttreatment)

<i>Gender</i>	<i>Self-reported depression score (pretreatment)</i>	<i>Self-reported depression score (follow-up 12 months)</i>	<i>p-value*</i>
Male	34 (24–46)	26 (20–29)	0.005
Female	57 (48–66)	28 (24–42)	0.004
	<i>Relationship assessment score (pretreatment)</i>	<i>Relationship assessment score (posttreatment)</i>	<i>p-value</i>
Male	18 (14–23)	28 (26–31)	0.005
Female	22 (13–24)	28 (25–33)	0.005

Data reported as median (range); \* Wilcoxon signed rank test used to compare pretreatment score with the score at follow-up

**Strength and Limitations**

Our study is the first to assess the effect of spinal anesthesia facilitated sexual intercourse on FSFI in women. It also improved depression and relationship quality in couples with vaginismus. We used standardized scales to assess both depression and relationship quality before and after the intervention. We assessed FSFI, which is an international measure of sexual activity in women.

The major limitation of our study is the anesthesia technique which needs a controlled environment. The single subject acting

as its control design cannot be used to generalize findings but are ideal for testing new methods.

**Interpretation**

Fear of vaginal penetration stems from previous negative/bad experiences with penetration. The woman then tends to avoid all activities related to penetration as a coping mechanism. Fear and avoidance behavior are key elements of vaginismus. Hence vaginismus is a conditioned response to certain sexual stimuli, and



exposure can help allay fears in these women. In our study, women were able to have sexual intercourse; pain, however, continued in some women.

If fear can be reduced, penetration is possible. Fear can be reduced by gradual exposure or by reducing avoidance. Fear persists because avoidance does not allow any opportunity to challenge the belief. After spinal anesthesia facilitated sexual intercourse, couples were instructed to have continued exposure on a daily basis. After the initial intervention, the continued exposure helped to sustain the effectiveness, and eventually, women were able to have successful intercourse. However, it took time and patience for the male partners. This would not have been possible without their support.

Because anesthesia relaxes all muscles and most patients believe it makes them pain-free, we analyzed the effect of negative penetration beliefs, sexual pain, and sexual satisfaction to assess the effect of the intervention. Each subject acted as their control, and our study showed that after successful sexual intercourse, the VPCQ domains improved significantly after intervention at the first follow-up and showed a statistically significant improvement at the second follow-up as well.

Female sexual function indexes (FSFI's) Urdu validated version (FSFI-U) was used in the study to assess the sexual function in females. The domains expected to score low were pain and satisfaction. But repeated unsuccessful attempts led to poor scores in all domains, and all domains improved significantly after treatment. This standardized approach helps to establish the fact that vaginismus is not just related to pain. It affects all domains and leads to poor FSFI. This significant improvement in FSFI can also be considered a quality of life improvement measure.

Spinal anesthesia is seen as the last resort. In our study, only those couples who had tried counseling and still failed to consummate marriage were included. It is not customary to offer intercourse under spinal and may open a Pandora of criticism. But, under controlled circumstances, the spinal is safe. Saddle block has been reported as a successful modality in certain select cases. Coskuner et al.<sup>13</sup> showed that saddle block requires less monitoring and provides better mobility during intercourse as a motor block is minimum.

Motor blockade acts as a double-edged sword. On the one hand, the woman does not have any control; it relaxes all muscles and minimizes spasms. On the other hand, it also leaves the woman numb, and intercourse can only be seen as a treatment option. All couples provided valid informed consent for this treatment option. The authors would also comment that the breakdown of a marriage is far more invasive than the treatment offered. Patient acceptability is a major area of concern when offering such treatment. Another aspect is the expectation from the treatment option in terms of successive attempts at intercourse without a spinal.

Painful sex continues to be a relationship issue and can lead to marital dys-harmony. Other consequences include infertility, low self-esteem, depression, and anxiety.<sup>14</sup> Several treatment modalities have been used to treat this condition. Psychotherapy, counseling, sensate focus, and dilators have been assessed as treatment modalities in previous studies. Current literature classifies it as difficult to treat multidimensional problems. The reported success of prescribed treatment varies.<sup>15</sup>

It has been proposed that treatment of vaginismus can improve depression and relationship quality in couples. Posttreatment, both males and females had significant improvement in both depression and relationship quality. The consummation of marriage

and subsequent successful intercourse apparently removed the disharmony.

It has been contemplated that vaginismus may recur even after successful treatment. Another valid objection can be that the couple is emotionally scarred by the experience. This question needs to be addressed by other studies.

We suggest further studies evaluating the acceptability of spinal anesthesia in women with vaginismus. The acceptability and cost-effectiveness of this once-only treatment modality might be advantageous.

## CONCLUSION

Our comparative study shows that spinal anesthesia can be used as a last-resort management option in women suffering from vaginismus. It provides some hope for such couples.

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