World Journal of Surgery and Surgical Research

Research Article
Published: 10 May, 2023

Primary Outcomes of the Evaluation of Female Sexual Dysfunction in Women Admitted by a Severe Pelvic Inflammatory Disease

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Abstract

Purpose: In the current literature there is little information on the evaluation of the sexual sphere in women affected by a Pelvic Inflammatory Disease (PID). The aim is to assess female sexual dysfunction and describe the factors that appear most frequently along in this group of women.

Methods: Prospective observational cohort study made up of patients who require hospital admission to be treated during an acute process of PID by analyzing their degree of female sexual dysfunction. To study the sexual function in a group of female patients admitted in a hospital because of a PID.

Results: Based on the FSFI scoring criteria, we can consider that 75% of our studied population suffers from sexual dysfunction, where the lowest score was 2 points, while the highest was 28.3.

Severe PID may cause a great psychological and physical impact in their sexual life.

It should be noted that one of the greatest reinforcements is that it is the first study to analyze sexual function in patients affected by a severe PID. While one of the major limitations of the study is the sample size due to the short recruitment time of the sample.

Conclusion: Female Sexual Dysfunction (FSD) prevalence in women admitted for severe PID is much higher than the percentage described in general women population. The study of the FSD continues to be a pending subject worldwide, becoming really important the improvement of its diagnostic, prevention and treatment to face properly this prevalent and underdiagnosed pathology.

Keywords: Female sexual dysfunction; Pelvic inflammatory disease; Sexually transmitted disease; Gynecological abdominal pain; Sexual behavior

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Received Date: *22 Apr 2023*
Accepted Date: *05 May 2023*
Published Date: *10 May 2023*

Citation:
Rodríguez-Mias NL, Cubo-Abert M, Forcada-Guash C, Acosta-Sanchez U, Pancorbo-Lerma M, Molero-Rodríguez F. Primary Outcomes of the Evaluation of Female Sexual Dysfunction in Women Admitted by a Severe Pelvic Inflammatory Disease. World J Surg Surgical Res. 2023; 6: 1464.

Introduction

Sexuality is the way in which each person has to live the fact of being sexed. It is an integral part of the personality of every human being and is built through the relationship between the individual and social structures, being essential for the individual, interpersonal and social well-being.

Female Sexual Dysfunction (FSD), defined as distressing sexual conditions and sexual health problems experienced by women, negatively affects quality of life and interpersonal relationships. FSD is a common entity in women throughout their lives and refers to various sexual dysfunctions including: Decreased arousal, trouble reaching orgasm, dyspareunia and low desire. Its prevalence is reported from 20% to 43% [1], although it should be noted that, within the field of medicine, and especially gynecology, the sexual health approach is precarious. Although sexual dysfunction is found to be more prevalent in women than in men, sexual dysfunction in women has not been studied as much as in men. The study of women with female sexual disorders advanced dramatically from Masters and Johnson with their first studies in 1957.

On the other hand, we have the Pelvic Inflammatory Disease (PID), which is defined as a clinical syndrome of the female reproductive tract characterized by inflammation of the endometrium, fallopian tubes, or peritoneum. PID occurs when microorganisms ascend from the vagina or cervix to the fallopian tubes and other upper genital tract structures. PID can result from untreated

bacterial infections, including chlamydia and gonorrhea, and can lead to infertility, ectopic pregnancy, and chronic pelvic pain.

Adolescents and young adults are at higher risk for Sexually Transmitted Infections (STIs) because the engage in more concurrent partnerships, multiple sex partners, and unprotected sex, besides it is also more common sexual partnerships that overlap in time or concurrent partnerships, easing the transmission of agents of STIs. The most recent studies show high rates of adverse outcomes in women with a history of PID, affecting mainly women during their reproductive age. However, despite the progress of society in terms of a more tolerant and open-minded in sexuality, in the current literature there are no studies on female sexual function in patients diagnosed with a PID.

Thus, within this social context, we propose a study to obtain clinical information on female sexual state and assessment in a subgroup of the female population affected by a PID. As they are considered a group of women with higher risk to suffer from FSD and its complications during and after the treatment of the infection. As they are supposed to have a much more active sexual life than other social groups.

Materials and Methods

A prospective observational cohort study made up of patients who require hospital admission in the Gynecology Unit at the Vall d'Hebron Hospital during the acute process of a severe PID, during the first quarter of 2020.

The study was approved by the Clinical Research Ethics Committee of the University Hospital with reference code PR (AMI) 347/2019. The study has been carried out in accordance with the Declaration of Helsinki (7th revision) and the principles of Good Clinical Practice.

All women who have met all inclusion criteria have been informed of the project and have been given the study information sheet during their admission. If the patient has declared her agreement to participate in the project, a written informed consent has been obtained and afterwards the Female Sexual Function Index (FSFI) questionnaire has been filled out during their admission.

All epidemiological and clinical data have been acquired prospectively during the stay in the hospital. Trained gynecologists have interviewed and examined all women to obtain their general medical and specific gynecological history, collecting all the information in a Microsoft Excel® database.

The number of patients included have been the number of the patients admitted due to PID during the first quarter of 2020. Based on the CDC definition, we accept a PID as a spectrum of inflammatory disorders of the upper female genital tract, including any combination of endometritis, salpingitis, tubo-ovarian abscess, and pelvic peritonitis. Sexually transmitted organisms, especially *N. gonorrhoeae* and *C. trachomatis*, are implicated in many cases. Acute PID is difficult to diagnose because of the wide variation in symptoms and signs associated with this condition. Many women with PID have subtle or nonspecific symptoms or are even asymptomatic. Delay in its diagnosis and treatment probably contributes to inflammatory sequelae in the upper reproductive tract.

So, the established inclusion criteria have been: Women with suggestive clinic of PID who are visited in our gynecology emergency department or are referrer from other centers or units outside under the suspected diagnosis of PID. Based on the clinical criteria of history of continuous, dull, progressive pelvic abdominal pain over a period of 30 days or less; adnexal pain on examination or pain cervical mobilization on bimanual examination; leucorrhea or cervicitis mucopurulent or untreated but documented gonococcal or chlamydial cervicitis a part from asking about their history of sexual activity in recent months. They must be of legal age with the capacity to complete the proposed questionnaires, and to accept their participation by signing the written consent to be included in the study.

Data collection and analysis has been carried out during the first semester of 2020 in the same hospital facilities. All members of the study explicitly commit to preserve the confidentiality of the data processed and to maintain at all times the anonymity of the patients.

Information collected for the study includes: Sociodemographic data (age, race, weight, height, toxic habits, marital status, health system and type of health care); medical or surgical history (DM, HT, hypercholesterolemia, anxiety or depressive syndrome, non-gynecological oncological history); gynecological history (PID, pelvic pain, endometriosis, myomatosis, gynecological tumor, pelvic floor pathology), parity and type of delivery, menstrual type, contraceptive method, sexual orientation, number of sexual partners in the last year, previous history of PID). Clinical information obtained from the hospital admission includes: Number of days of admission, reason for consultation (abdominal pain, fever, leucorrhea, dyspareunia, abnormal bleeding, others), diagnostic orientation (severe PID, unilateral or bilateral pyosalpinx, unilateral or bilateral tubo-ovarian abscess, pelviperitonitis, Sd Fitz-Hugh-Curtis, others), vaginal and endocervical cultures as well as blood cultures and/or IUD cultures, other serologies. Finally, information on the antibiotic and surgical treatment, if received, is collected, detailing the type of surgery performed, as well as the removal of the IUD, if it has been necessary. Other relevant clinical information obtained during the hospitalization is that related to her sexual life based on the information got from the Female Sexual Function Index (FSFI) validated into Spanish. For the analysis of the data, we have used an encoded database excluding any data regarding the identification of patients included in compliance with the Organic Law on Data Protection (LOPD).

The statistical analysis of the data is carried out using SPSS® software version 19.0 for Windows. The categorical and quantitative variables will be described according to frequency and measures of central tendency. For the eventual comparison of age groups or other subclassification, the statistical significance for a bilateral p-value <0.05 and the 95% confidence indices will be calculated. The statistical analysis of the possible variables has been analyzed with the program SPSS PASW Statistics 18.

Results

A total of twelve women have been included in this study under the suspected diagnosis of severe PID to receive treatment in our center, during the first quarter of 2020; all of them agreeing to be included in it.

From the epidemiologic descriptive data collected and analyzed (Table 1), it has to be highlighted that the ages of the participants were between 20 to 48 years and the mean age was 36 years. Regarding weight and BMI in our population, it is worth noting an average of 61 kg with an average BMI of 23, considering these within normal

Table 1: Demographics and pathologic measures of women participants.

		Value	n	%
Age (years)	Mean	36		
	Minimum	20		
	Maximum	48		
	Median	40		
Weight (kg)	Mean	61		
	Minimum	42		
	Maximum	80		
	Median	63		
Height (cm)	Mean	163		
	Minimum	152		
	Maximum	183		
	Median	160		
BMI	Mean	23		
	Minimum	17		
	Maximum	28		
	Median	23		
Ethnicity	Caucasian		11	72
	Black		1	8
Smoking	Smoker		4	25
	Non-Smoker		8	75
Parity	0		5	41.6
	1		2	16.6
	2		3	25
	3		2	16.6
	4		2	16.6
	More than 4		0	0
Menstrual status	Normal menstruation		12	100
	Menopause		0	0
Contraception	None		3	25
	Contraceptive Pills		1	8.3
	IUD		7	58.3
	Condom		1	8.3
	Other		0	0
Number Sexual Partners	0		1	8.3
	1		8	66.6
	2		2	16.6
	3		1	8.3
	4		1	8.3
	5		1	8.3
	More than 5		0	0
Sexual Orientation	Heterosexual		12	100
	Homosexual		0	0
	Other		0	0
Previous STD			1	8.3

weight (according to the WHO classification), only four of them (25%) refereed smoking habits and 72% (n=11) of the patients were Caucasian, while an 8% (n=1) were black.

Regarding the gynecological history (Table 1), variables reviewed, it should be noted that none are nulliparous and the median parity was 2.2 children per women, where only two patients with a history of caesarean section, the rest of them were vaginal deliveries. No menopausal women were included. 100% (n=12) of our participants reported heterosexual orientation and most of them, 66.6%, reported only having had one sexual partner in the last year, while another 41.5% declared two or more different sexual partners in the last 12 months. Only 8.3% (n=1) of them explained a history of an STI in the past.

Focusing on the data obtained from the hospital admission, it must be outlined that the average stay has been 7 days and the main reason they have consulted has been entirely for abdominal pain, in addition to 66% explaining fever and another 55% leucorrhea. The final diagnosis in all of them has been a severe PID, while 25% have also associated a unilateral pyosalpinx and another 25% a bilateral pyosalpinx.

In detail, the results obtained from endocervical cultures, blood cultures, and IUD cultures, show 25% of our patients affected by *Chlamydia trachomatis*, another 25% by *Ureaplasma urealyticum* and another 16.6% by *Neisseria gonorrhoeae*. The other 33% did not obtain positive cultures for any studied germs.

On the other hand, basing on the treatment received during the hospital admission, 100% of the patients have been administrated broad spectrum antibiotic, which in each case has been adapted based on the results of the cultures collected at the admission. Besides, 25% of them have required also a laparoscopic surgery.

Finally, about female sexual function assessment, based on the FSFI questionnaire as it is accepted by the International Consensus Development classification, it is simple, reliable, and self-administered instrument, we have obtained the following results (Table 2, 3). Reading into these results, we have obtained that 9 out of 12 patients report a score of less than 26 points, which means that 75% of our studied population suffer from a sexual dysfunction (Figure 1). Compared to the sexual dysfunction rate in Spanish premenopausal women, which is reported to be between 25% to 42.51%, we can assess that in our population there is a serious involvement of PID in their sexual function. So, based on to the current DSM-V FSD classification, we can conclude that the most prevalent disorder in our group is the female interest disorder or sexual arousal, followed by a female orgasmic disorder and, finally, a genito-pelvic pain disorder. The scores by domain are shown in Table 2 and 3, where we interpret again that all the domains in our patients are altered, demonstrating

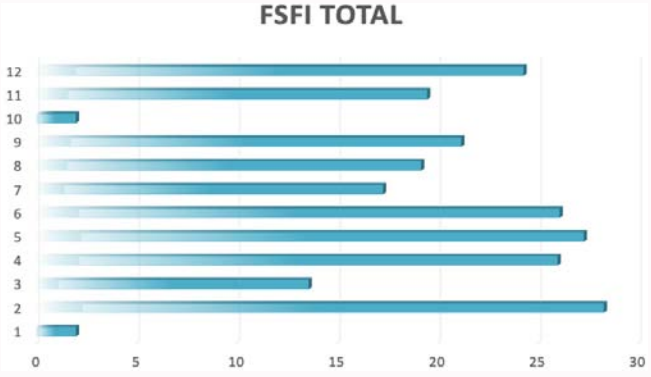

Figure 1: FSFI Final Score by patient.

Table 2: FSFI Final Score by domains and patients.

	Desire	Arousal	lubrication	Orgasm	Satisfaction	Dyspareunia	FSFI TOTAL
1	**1.2**	**0**	**0**	**0**	**0.8**	**0**	**2**
2	4.8	4.2	**3.3**	5.6	4.4	6	28.3
3	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**1.6**	**13.6**
4	3.6	4.8	4.8	4.4	5.2	**3.2**	**26**
5	3.6	4.2	5.1	5.2	4	5.2	27.3
6	3.6	5.1	**3**	4.8	6	3.6	26.1
7	**2.4**	**2.1**	**2.4**	**3.2**	**1.6**	5.6	**17.3**
8	**2.4**	3.6	3.6	**3.2**	3.6	**2.8**	**19.2**
9	**2.4**	**3**	4.2	4	5.2	**2.4**	**21.2**
10	**1.2**	**0**	**0**	**0**	**0.8**	**0**	**2**
11	**1.8**	**2.7**	**3**	**2.8**	4.4	4.8	**19.5**
12	4.2	4.5	3.6	4.8	4	**3.2**	**24.3**

Table 3: FSFI final general score.

	Desire	Excitement	Lubrication	Orgasm	Satisfaction	Pain	FSFI TOTAL
Mean	2.8	3.05	2.95	3.37	3.53	3.2	2.8
Minimum	1.2	0	0	0	0.8	0	1.2
Maximum	4.8	5.1	5.1	5.6	6	6	4.8
Median	0	2.25	1.8	2.4	2.4	1.6	0

an important and extensive sexual dysfunction.

Although due to the fact of being a small sample, we have not been able to obtain statistically significant differences in the univariate regression between the variables referring to sociodemographic information and sexual satisfaction, it does not mean that they do not have an important implication at the level of sexuality. Furthermore, we hope to be able to demonstrate them in future studies with a greater number of patients, we could be able to demonstrate some other specific curiosities on sexuality in our target population.

Discussion

Sexuality is an important aspect of a woman's quality of life and it is a reflection of her level of physical, psychological and social well-being. However, in today's society and with the evolution of new technologies, often we have to deal with certain sexual health problems during our clinical practice which are not easy to manage its approach.

The literature describes a FSD rate up to 50% of middle-aged women [1], mainly compromising desire and excitement, although there is little and unspecific data about it, we have only found an article which mentions slightly something about sexuality in women affected by PID [2].

Based on Masters and Johnson linear sexual response model, the DSM-V proposes a new FSD classification into three groups including: Female sexual arousal or interest disorder, orgasmic disorder female and genito-pelvic pain or penetration disorder. Usually, the FSD has a multifactorial etiology, taking into account biological, psychosocial, medical and inter and intrapersonal factors when evaluating it. All that added to a high ignorance to FSD knowledge compared to male dysfunction.

Currently different diagnostic methods for FSD are validated, but one of the most used is the validated questionnaire Index of Female Sexual Function (FSFI), as it is easily self-administered, it is simple and reliable and it was described by Rosen et al. in 2002; besides it has been lately translated and validated into Spanish [3-5].

After analyzing our results, in which we have studied the FSD in a very specific subgroup of women, those who required an admission in a hospital to receive treatment for a severe PID, we have obtained some interesting data that has never been published before. Based on that, we can report that compared to the FSD prevalence in the general Spanish women [6,7], our subgroup of women suffers much more FSD than other groups of women. As they are probably in a higher risk to suffer from FSD due to their condition and their increased sexual activity [2].

This study shows a population of women aged between 20 to 48 years, with an average BMI of 23, where the 72% of them are Caucasian. Regarding their gynecological-obstetric history, it stands out that 41.6% are nulliparous women, 58% are users of an IUD and that 25% do not use any type of contraceptive method during sexual intercourse. Not only that, but up to 41.5% explain two or more different sexual partners in the last 12 months. Data about hospital admission shows an average hospital stay of 7 days, where the main reason for consulting the emergency department was abdominal pain followed by fever. While all the PID admitted added in 25% of the cases a unilateral pyosalpinx, another 25% presented a bilateral pyosalpinx. Regarding the microbiology cultures, our results demonstrate in 25% of them *Chlamydia trachomatis*, 25% *Ureaplasma urealyticum* and 16.6% *Neisseria gonorrhoeae* in endocervical culture. Although 100% of them had to be administered intravenous antibiotic treatment, while up to 25% of them had to also undergo a surgery to resolve the clinical condition.

Finally, focusing on their sexuality and evaluating their possible FSD, based on FSFI questionnaire, we have obtained that most of our patients (75%) meet the criteria of a sexual dysfunction. And, if we compare these results to the general Spanish women population

(25% to 42%), we have to accept that the PID condition might cause a serious physical and psychological impact on their sexuality. So, based on to the current DSM-V FSD classification, we can conclude that the most prevalent disorder is our group is the female interest disorder or sexual arousal, followed by a female orgasmic disorder and, finally, a genito-pelvic pain disorder.

Although the statistical analysis of a univariate regression, due to the small sample, cannot reach statistical significance and cannot demonstrate which factors might be associated to FSD, we believe that an upcoming larger prospective study will give us much more interesting and statistically significant results. So, once more reliable data will be obtained, we will be able to enforce these results to improve the public sexual health and social intervention; especially those women who are in higher risk of suffering from a PID and FSD, mainly focusing in to improve PID prevention, diagnosis and treatment.

The findings from this work must be considered in light of several limitations. We have used a small sample of women as this pathology although it is common not all of them require to be admitted in a hospital for its treatment, which makes it to decrease the sample. We must accept that the recruitment period it has been very short, but we are still going on with this project to get a larger sample. Even so, these findings are resulting really interesting as no other data has ever been published before about it, and there is currently a lot of interest in this topic from the point of view of the medical sexology and gynecology.

Conclusion

In summary, considering all the literature related to FSD and analyzing our data, we conclude that the prevalence of FSD in our population (women affected by a severe PID) is much higher than the percentage described in general women population, 75% *vs.* 30% to 40%. Our evidence also suggests that these patients may be more susceptible to suffer from FSD causing a great impact psychologically and physically after being diagnosed with a PID. Our results show mainly a negative effect in some specific sexual domain such as desire, excitement and lubrication, although the rest of all other domains might be also affected. But we should consider stop thinking deeply if this FSD is already evanescent and comes to light when the PID appears or on the contrary this arises "*de novo*" after the infection is diagnosed; as our conduct from a sanitary point of view would be really different in our target population from special preventive measures to a personalized treatment and follow-up after their hospital admission.

Taking all this into account and due to the limitations of the study, mainly the size of the sample, we are encouraged to continue with this project, even planning a multicentric study, in order to be able to analyze and determine possible risk or protective factors related to sexual satisfaction specially in our target population, as well as in the general population.

We are now facing an important underdiagnosed health problem which needs to be improved its prevention, diagnosis and treatment as it is increasingly affecting many women of all ages all over the world. Many more studies are needed, larger samples and worldwide to develop better diagnostic, preventive and therapeutic multidisciplinary plans, so we will be able to improve our women sexual health care and to support them better to face this problem properly promoting a normal and more affective sexuality.

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