Sexual Inhibition and Sexual Excitation Profiles in Men with and Without Erectile Disorder

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OBJECTIVE To investigate sexual excitation (SE) and sexual inhibition (SI) profiles in men with erectile dysfunction (ED) and to examine how these dimensions discriminate between men with and without ED.

METHODS A clinical sample of 37 men with situational (psychogenic) ED and a control group of 40 sexually healthy men (matching the clinical group in age, marital status, and educational level) were constituted. Participants completed self-reported questionnaires assessing sexual function and the propensity for SI and SE.

RESULTS Higher propensities for SI due to the threat of performance failure (SIS1, $P < .001$) and SI due to the threat of performance consequences (SIS2, $P < .01$) were found in the group of men with ED. No significant differences were found between the 2 groups in the propensity for SE.

CONCLUSION Findings offer additional support for the Dual Control Model of Sexual Response and underscore the relevance of inhibitory mechanisms as potential psychobiological risk factors for the development and maintenance of ED. Findings also highlight the importance of a multidisciplinary approach in the clinical management of ED. UROLOGY 161: 71–75, 2022. © 2021 Elsevier Inc.

The Dual Control Model of sexual response (DCM) conceptualizes sexual response as a result of a balance between excitatory and inhibitory mechanisms that act centrally in the brain.[1,2] One of the basic premises of the DCM is that individuals vary in their propensities for such mechanisms, which, at moderate levels, are assumed to be beneficial and adaptive. However, more extreme variations in the propensity for sexual excitation and inhibition may be associated with problems with sexual function and behavior (eg, risky sex, hypersexuality).[2,3] Concerning sexual problems, the model proposes that an individual's propensity for high sexual inhibition may increase the likelihood of an impaired sexual response, particularly if it is associated with low sexual excitation.[2-5]

Research on the DCM, using the Sexual Inhibition and Sexual Excitation Scales (SIS/SES), has identified two types of sexual inhibition. SIS1 or "sexual inhibition due to the threat of performance failure" has been suggested to reflect an inhibitory trait related to a perceived threat or individual's anticipated failure of sexual response (eg, concerns about losing arousal or worrying about pleasing the partner) and, therefore, considered as particularly relevant to sexual problems.[5-9] Earlier findings have provided support for the idea that high SIS1, along with low SES, is relevant to the prediction of erectile difficulties in non-clinical samples.[8] SIS2 or "sexual inhibition due to the threat of performance consequences" reflects an inhibition in response to external threats or anticipated negative consequences of sex (eg, fear of unwanted pregnancy or sexually transmitted disease, risk of being caught) and has been shown to be more relevant to sexual risk taking.[5-8]

Studies on the relevance of the DCM on male sexual functioning have revealed a positive predictive value of both inhibition dimensions, particularly of SIS1, and a negative predictive value of SES in predicting erectile difficulties in non-clinical samples.[4,5,8] Janssen et al[8] found that both inhibition dimensions and age were significant predictors of ever having experienced sexual difficulties in a sample of 313 men (mean age = 46 years, SD = 12), and SIS1 and age were strong predictors of sexual difficulties in the previous 3 months. In this study, SES constituted only a marginal and negative predictor of men's sexual difficulties in the previous 3 months. Age and SIS1 have also been found to be negative predictors of erectile function, along with sexual desire and orgasm, in a community sample of 370 Portuguese men (mean age = 39, SD = 16), whereas SES constituted a positive predictor of erectile function and sexual desire.[10] Taken together, these findings suggest that sexual excitation and sexual inhibition

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processes are relevant for men's sexual function and that SIS1 may reflect a vulnerability trait for erectile problems while SIS2 reflects an inhibitory mechanism in response to a situational threat.[5,8]

Despite the growing number of studies designed to examine the role of sexual inhibition and sexual excitation processes in sexual functioning, studies using clinical samples, in particular involving men with erectile disorder, are still scarce. To date, empirical evidence on the relevance of sexual inhibition and sexual excitation to erectile disorder is limited to study of Bancroft et al[11] and Louizos et al[12]. Bancroft et al compared a sample of 146 men (mean age = 47, SD = 13) diagnosed with erectile dysfunction to an age-matched non-clinical sample. Findings showed that men with erectile dysfunction presented a similar SES and SIS1 profile when compared to men from the general population who reported having erectile difficulties in most of the times. Another interesting finding revealed by this study concerns the propensity for higher SES, but not SIS1, found in men with erectile dysfunction suggestive of a psychogenic etiology, when compared with men presenting medical comorbidities associated with erectile dysfunction.[11]

Louizos et al conducted a study designed to assess changes in sexual inhibition and sexual excitation in men diagnosed with psychogenic erectile disorder under PDE5 treatment.[12] Even though SIS/SES was of little value in predicting erectile function in this study, which may be partially explained by using men already under pharmacological treatment and the absence of a pre-med SIS/SES measurement, findings indicated that men with mild erectile difficulties reported significantly higher SES and lower SIS1 at recruitment and 3 months after treatment, when compared to men with moderate erectile problems. A significant decrease in SIS1 over the course of the treatment was observed in the group of men presenting with mild erectile problems, and only a trend to an increase in SES and a decrease in SIS2 was found in this group.[12]

Although the DCM represents an innovation for understanding male sexual response, more research using clinical samples is indicated. Given the potential clinical relevance of the model, the current study examined sexual inhibition and sexual excitation profiles in Portuguese men with and without erectile disorder. We predicted that SIS1 and SIS2 would differentiate between men with situational (psychogenic) erectile dysfunction and sexually healthy men. No group differences were anticipated for SE.

METHODS

Participants and Procedures

A total of 77 men participated in this study. A clinical group was recruited from two Portuguese outpatient sexology clinics and consisted of 37 men diagnosed with erectile disorder.[13] Men with erectile disorder were clinically assessed by a medical team consisting of urologists and trained sex therapists. Subjects received a clinical diagnosis of erectile disorder according to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders.[13] Men with a clinical diagnosis of erectile disorder experienced a marked difficulty in obtaining an erection during sexual activity and/or a marked difficulty in maintaining an erection until the completion of sexual activity, and/or a marked decrease in erectile rigidity, on almost all or all of sexual occasions with a partner, but not during masturbation or other sexual situations (situational erectile disorder), for the 6months prior to medical assessment. On average, the participants were experiencing erectile problems for 23 months (SD = 19.24, range: 6 − 78). Self-reported nocturnal penile tumescence, complete morning erections, and spontaneous erections during the day were present in all men. From a medical point of view no relevant medical conditions, organic impairment, psychopathology, or substance use was found that could justify the onset of the difficulties, which was suggestive of a psychological etiology to the difficulties.[13] Participants were informed about the purpose of the study, and for those who agreed to participate, instructions were provided, and a consent form was signed. Questionnaires were completed autonomously by participants in a private room and returned directly to one of the members of the medical team. The percentage of eligible participants that agreed to participate in the study was 95%.

Participants from the control group were selected from a sample of men recruited at university campuses and from the general population through advertisements.[10] The cutoff points of the International Index of Erectile Function[14,15] were used to ensure that the control group had no sexual difficulties. Forty sexually healthy men were selected to match the clinical group for age, marital status, and educational level. All participants of both groups reported a heterosexual sexual orientation and reported having partnered sexual activity with a partner at least once during the past four weeks.

Participants from clinical and control groups were not paid for their participation. The study protocol was approved by both the university and hospitals institutional review boards. The demographic characteristics of the groups are displayed in (Table 1).

Measures

Sexual Dysfunction Interview (SDI). The SDI[16] is a structured interview aimed to assess male and female sexual dysfunctions, based on DSM-IV-TR[17] criteria. SDI provides clinicians with relevant information concerning several aspects of sexuality (eg, sexual orientation, sexual behavior or unwanted sexual experiences). In this study, a modified version of the male version of SDI was used to include the updated criteria of the latest version of DSM.

The Sexual Inhibition and Sexual Excitation Scales (SIS/SES). The SIS/SES questionnaire[8] contains 45-items describing different types of hypothetical situations leading to sexual arousal or loss of sexual arousal due to intrapersonal or interpersonal threat (eg, negative consequences of having sex, unable to perform sexually) or non-threatening potentially sexually exciting situations (eg, sexually exciting social interactions, visual, tactile or imaginary stimulus). Using a 4-point Likert scale ranging from 1 ("*Strongly agree*") to 4 ("*Strongly disagree*"), participants indicate their typical response to the types of situations or stimuli described. Both the original scale and the Portuguese version of the SIS/SES have demonstrated good psychometric characteristics.[8,10]

The International Index of Erectile Function (IIEF). The IIEF[18] is a brief, multidimensional and self-administered questionnaire developed to assess several dimensions of male sexual

Table 1. Sociodemographic characteristics of the clinical and control groups (n = 77)

	Clinical Group (n = 37)	Control Group (n = 40)
Age (in ys)		
Mean	47.8	42.9
SD	12.3	8.8
Range	18-64	20–65
Marital Status	n (%)	n (%)
Single	4 (10.8)	4 (10)
Married/ Cohabiting	27 (73)	32 (80)
Divorced/ Widowed	6 (16.2)	4 (10)
Educational Level	n (%)	n (%)
0–9 ys	26 (70.3)	26 (65)
10–12 ys	9 (24.3)	11 (27.5)
13 or more ys	2 (5.4)	3 (7.5)

functioning. The scale comprises 15 items assessing five central domains of male sexual function for the past 4 weeks: erectile function, orgasmic function, sexual desire, intercourse satisfaction, and overall satisfaction. Given the well-demonstrated psychometric validity and reliability of the scale, the IIEF has become a standard instrument for assessing male sexual function in both clinical and research settings worldwide.[15,19] The Portuguese version of the IIEF has also demonstrated good psychometric characteristics.[20]

Data Analysis

Statistical analyses were performed using the Statistical Package for Social Sciences software (SPSS version 25.0; Chicago, Inc, IL). Descriptive statistics (mean and standard deviation) were examined for the sociodemographic characteristics of the clinical and control groups and are presented in (Table 1). Multivariate analysis of variance (MANOVA) and univariate analysis of variance (ANOVAs) followed by follow-up tests were conducted to compare group scores on the SIS/SES scales. A P-value less than .05 ($P \leq .05$) was considered statistically significant.

RESULTS

Sexual Excitation/Sexual Inhibition and Erectile Functioning

Multivariate analysis of variance (MANOVA) was conducted to compare clinical and control groups on SIS/SES scores. The multivariate tests showed a statistically significant group effect [Wilks' $\Lambda = .31$, $F(3, 73) = 53.04$, $P < .001$, $\acute{\eta}_p^2 = .69$]. As illustrated in Table 2, univariate analysis of variance (ANOVAs) revealed significant group differences on both sexual inhibition scales [SIS1: $F(1, 75) = 162.15$, $P < .001$, $\acute{\eta}p^2 = .684$, SIS2: $F(1, 75) = 9.13$, $P < .01$, $\acute{\eta}p^2 = .108$]. Men with erectile disorder reported significantly higher levels of sexual inhibition due to the threat of performance failure (SIS1: M = 25.5, SD = 3.2) and sexual inhibition due to the threat of performance consequences (SIS2: M = 19.5, SD = 2) as compared to sexually healthy individuals (SIS1: M = 16.4, SD = 3.1; SIS2: M = 17.8, SD = 2.8). The magnitude of the effect was highest for SIS1. No significant differences were found for SES (see Table 2).

DISCUSSION

One of the major contributions of the DCM relies on its potential for understanding how sexual excitation and sexual inhibition operate in individuals experiencing sexual problems.[5] Even though earlier findings support the importance of such mechanisms in predicting erectile difficulties in non-clinical samples[8] and in clinical samples,[11,12] additional empirical evidence relying on clinical samples is required to support the clinical relevance of the model to male sexual functioning. The present study was designed to investigate the importance of sexual inhibition and sexual excitation mechanisms in men with situational (psychogenic) erectile dysfunction and is the first of its kind conducted in Europe using a clinical sample.

As hypothesized, both types of sexual inhibition constituted important discriminative dimensions between men with erectile disorder and sexually healthy men and this effect was particularly evident for SIS1. Men from our clinical sample presented a significantly higher propensity for both sexual inhibition due to the threat of performance failure and to the threat of performance consequences when compared to sexually healthy men, which is in line with one of the central assumptions of the DCM[2,4,5] and is also consistent with previous findings using clinical and non-clinical samples.[8,11] A higher propensity for SIS1 in men with psychogenic erectile disorder may reflect the existence of an underlying increased inhibitory tone which is active in situations relevant to sexual activity and is interfering with sexual response during sexual activity with a partner. The means by which this inhibition system is expressed within the individual and becomes particularly evident in sexual occasions may be beyond biological determination and be modulated by a complex interplay between socio-cultural influences (eg, education, socialization) and individual's cognitive system and information processing processes. An example of cognitive dimensions which may facilitate the activation of

Table 2. Sexual inhibition and sexual excitation in men with and without erectile disorder (n = 77)

	Clinical Group		Control Group		F (1, 75)	P	$\acute{\eta}_p^2$
SIS/SES	M	SD	M	SD			
SES	49.89	5.69	52.33	7.63	2.48	.119	.032
SIS1	25.54	3.17	16.40	3.13	162.15†	.001	.684
SIS2	19.46	2.01	17.78	2.79	9.13*	.003	.108

* $P < .01$,
† $P < .001$.

sexual inhibition in sexual occasions is the existence of sexual myths about sexual functioning and erroneous sexual beliefs about sexuality.[21] These cognitive variables configure a particular type of culturally transmitted messages which may have a negative impact on male sexuality in already vulnerable individuals, as it incorporates a constant pressure for a faultless sexual performance in men, regardless of the context, partner or situation. Such messages conveying an excessive emphasis on sexual performance in men (eg, "strong and lasting erections is a sign of masculinity and a central condition for women's and men's sexual pleasure and satisfaction") are widely widespread and entrenched in our society, may play an important role in triggering specific negative cognitive schemas and intensify performance anxiety in already high inhibition prone individuals.[22,23] As a result, under a high demand for performance, the perceived threat of a possible inadequate performance in a particular sexual context, along with individual's recurrent experience of his inconsistent sexual response in those situations, may increase the anticipatory perception of threat and related efforts to prevent sexual failure (eg, monitoring of one's sexual response) which may increase anxiety performance, lead to a poor sexual performance, and promote the occurrence of negative sexual experiences over time.[23,24]

Although at a lesser extent, our findings demonstrated the relevance of SIS2 in discriminating men with and without erectile disorder. SIS2 has been particularly associated to sexual risk-taking behavior,[5-8] but significant effects have also been found in men experiencing erectile problems who reported relationship concerns.[11] The anticipation of negative consequences by the sexual partner, which is not an uncommon concern in men experiencing erectile problems who seek clinical assistance, may constitute an external threat incorporated in SIS2 and therefore act as an additional trigger for the loss of sexual arousal in sexual occasions, contributing for the development and maintenance of erectile difficulties of men from our clinical sample.[3,8,11,12]

Another interesting finding in this study concerns the striking similarity of SES profiles found in men with and without erectile problems. Although the DCM postulates that men who are more likely to develop erectile problems may present a low propensity for sexual excitation (along with high sexual inhibition), our initial hypotheses did not address the potential discriminatory effect of SES among clinical and control groups. As the medical history of men who comprised the clinical sample ruled out the existence of relevant organic risk factors for erectile difficulties or evidence suggesting a physiological impairment of the erectile response, it was expected beforehand that sexual excitation mechanisms could be operating in an adaptive and a functional way in these men experiencing erectile disorder associated with psychological factors, as suggested in previous findings.[11,12]

Taken together, the findings of our study provide empirical support for the DCM while demonstrating how sexual excitation and sexual inhibition mechanisms operate in men with erectile disorder. These findings also highlight the importance of a multidisciplinary approach in the clinical management of erectile disorder, as long advocated.[25-30] Pharmacological agents such as phosphodiesterase type 5 (PDE5) may be the standard treatment for erectile disorder and one of the most effective ways to enhance and restore erection function for most men, but it does not configure a long-term solution for erectile disorder neither for improving sexual satisfaction.[31] Even though the use of oral agents may be important to mitigate, for example, the high inhibitory tone and facilitate the occurrence of erections in men experiencing erectile problems, this approach should be used in complementarity with a psychological approach addressing other relevant aspects of the disorder affecting not only the individual but also the couple. Studies have shown in a very consistent way that men with erectile disorder present a distinctive cognitive and behavioral pattern (eg, maladaptive cognitive schemas, myths and dysfunctional sexual beliefs, limited sexual repertoire, psychopathology)[21,23,32-34], which is commonly expressed within a disturbed affective relationship (eg, loss of intimacy and partner de-erotization, fears of rejection, conflicts, ineffective communication), and that needs to be addressed in the scope of a psychotherapeutic approach with a skilled psychological specialist. In conclusion, combining a pharmacological solution with a psychotherapeutic approach may prove to be of high therapeutic value for improving the man's and the couple's sexual satisfaction and well-being, above and beyond erectile function.[28,29,35-37]

Some limitations of the present study need to be acknowledged. The cross-sectional design of this study limits inferences about causality. Even though sexual inhibition reflects an individual propensity and has been conceptualized as a vulnerability dimension for the development of erectile disorder, research still needs to establish to what degree it may be modified by the experience of sexual difficulties and associated emotional discomfort. Several other variables (eg, cognitive, relational) could constitute potential mediators of the relationship between SIS/SES and erectile disorder, and which influence was not controlled for in this study. For this reason, it is recommended that future studies assess such dimensions in order to evaluate their relative role in erectile disorder. Despite the limitations of the study, the findings provide additional support and cross-cultural validation for the DCM and underscore the value of studying the role of excitatory and inhibitory processes in male sexual function and response.

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