Persistent Sexual Arousal Syndrome: A Descriptive Study

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ABSTRACT

Introduction. Persistent sexual arousal disorder (PSAS) is a poorly documented condition characterized by persistent genital arousal in the absence of conscious feelings of sexual desire.

Aim. To determine whether there are replicable features associated with PSAS, to describe salient characteristics of women reporting this condition, and to determine predictors of distress.

Methods. A 46-item Internet survey containing demographic information, symptom description, triggers, exacerbation and relief measures, distress ratings, and life and sexual satisfaction was placed on a secure server.

Main Outcome Measures. Frequency analyses of descriptive data, and stepwise multiple regression analysis to identify independent predictors of level of distress.

Results. Of the 103 respondents, most were in good health, well educated, and in long-term relationships. Ninety-eight percent of respondents met at least one criterion for PSAS and 53% met all five criteria. Involuntary genital and clitoral arousal persisting for extended time periods, genital arousal unrelated to subjective feelings of sexual desire, and genital arousal not relieved with orgasms were the most frequently endorsed features associated with this syndrome. Symptom triggers included sexual stimulation, masturbation, stress, and anxiety. Distress about the condition was low in 25%, moderate in 35%, and high in 40% of respondents. The strongest predictors of distress were intrusive and unwanted feelings of genital arousal ($P < 0.0001$), continuous symptoms ($P < 0.001$), feelings of unhappiness ($P < 0.03$), shame ($P = 0.0001$) and worry ($P = 0.01$), reduced sexual satisfaction ($P < 0.004$), enjoyment of symptoms some of the time ($P = 0.01$), and relationship status ($P < 0.004$).

Conclusion. The results of this research support the description of a condition (persistent sexual arousal) involving involuntary genital and clitoral arousal unrelated to subjective feelings of sexual desire which persists despite one or more orgasms and which usually feels intrusive and unwanted. Varying levels of distress were identified with this condition as well as a variety of primarily negative emotional reactions.

Key Words. Female Persistent Sexual Arousal Syndrome; Female Psychological Assessment of Sexual Dysfunction; Female Diagnostic Testing

Introduction

In 2003, persistent sexual arousal syndrome (PSAS) was included as a provisional diagnosis by an international committee of experts convened to recommend revisions in the nomenclature of women's sexual dysfunctions [1]. The disorder was defined as follows: spontaneous, intrusive, and unwanted genital arousal (e.g., tingling, throbbing, pulsating), which occurs in the absence of sexual interest and desire. Any awareness of subjective arousal is typically but not invariably unpleasant. The arousal is unrelieved by one or more orgasms and the feelings of arousal persists for hours or days. Although the complaint of persistent sexual arousal (PSAS) has only recently been identified and described as a unique condition reported by some women [2–5], it is likely that it is not a new phenomenon. The various components of the arousal syndrome, namely persistent feelings of genital arousal occurring without a precipitant and persisting for extended time periods, were undoubtedly experienced by women in the past but not reported because of feelings of shame, guilt, or embarrassment. However, with the increasing focus on all aspects of female sexuality, and with specific websites devoted to this complaint, more women are acknowledging this condition.

Although infrequent, the complaint is puzzling and perplexing. It is the opposite of the more typical female disorder, namely that of insufficient or lack of sexual arousal [6]. It is puzzling as well because of its sudden and mysterious onset and the persistence of genital sensations despite one or multiple orgasms.

This original description of PSAS was based on a small number of women. To date, neither the prevalence of the condition nor its defining characteristics have been empirically validated. Similarly, it has been impossible to establish any definite etiological explanation for the feelings of unrelieved genital arousal.

The present study was undertaken with three objectives: (i) to determine whether there are replicable diagnostic features associated with PSAS; (ii) to describe characteristics of women reporting this experience; and (iii) to determine predictors of distress.

Methods

A comprehensive, detailed questionnaire was developed in order to obtain information about all aspects of the condition. The 46-item questionnaire included: (i) descriptive information (e.g., age, marital status, educational level, and occupation; (ii) health history and menopausal status; (iii) questions focusing on the complaint of PSAS (onset, precipitants, and ameliorating factors); (iv) distress associated with the syndrome; (v) treatment interventions and their outcome; and (vi) open-ended questions eliciting respondents' explanations regarding the complaint. Although the questionnaire was not specifically tested to determine reliability and validity, a focus group of women complaining of the condition was employed to ascertain comprehensibility and meaningfulness of the questions. Additionally, the Female Sexual Function Inventory (FSFI) [7], a validated, 19-item questionnaire, was administered to assess the women's current sexual function.

Since the complaint of PSAS is uncommon in clinical practice, it was determined that collecting a convenience sample from an Internet survey would result in the largest number of respondents. Following approval by the University Institutional Review Board, the consent form and questionnaire were placed on a secure server, which could be assessed only by preauthorized personnel. The server was linked to three websites: University of Medicine and Dentistry of New Jersey—Center for Sexual and Relationship Health (http://www2.umdnj.edu/csrhweb), Network for Excellence in Women's Health (http://www.newshe.com), and the Institute for Personal Growth (http://ipgcounseling.com/survey). The first website describes the first author's sex therapy clinic and provides a link to the PSAS questionnaire. The second website is an informational website devoted to issues and questions concerning women's sexual health. The third website includes a survey on female sexuality for heterosexual, homosexual, and bisexual women and provides a link to the PSAS questionnaire. The questionnaires were preceded by a short description of PSAS followed by a consent form describing the research survey. The consent form described persistent sexual arousal in general terms but did not list the five distinguishing characteristics presumed to characterize this condition.

If a woman believed she had persistent genital arousal, and was willing to complete two questionnaires, she pressed an "I agree" button on the site and the questionnaires appeared. If, after reading or completing the survey, she wanted to submit it for data analysis, she pressed another button to

"send" the two questionnaires. No information about the respondents, such as IP addresses, were collected or saved in order to preserve confidentiality. However, following completion of the survey, women were informed that they could provide their name and telephone number for follow-up inquiry if they wished to speak to the investigators. There was no inducements or payment for participating in this research.

To be included in the data analysis, the respondent had to have checked at least one of the five diagnostic criteria for PSAS developed by the international panel of experts [1]: (i) involuntary genital and clitoral arousal that persists for an extended period of time (hours, days, months); (ii) the physical genital arousal does not go away following one or more orgasms; (iii) the genital arousal is unrelated to subjective feelings of sexual desire; (iv) the cause for the persistent genital arousal cannot be identified; or (v) the persistent feelings of genital arousal feel intrusive and unwanted.

Descriptive statistics were computed for the measures used in the analyses, and are reported as mean ± standard deviation. Pearson correlation coefficients (r) were used for association between interval measures. Stepwise multiple regression analysis was conducted to identify independent predictors of level of distress. Two-tailed P values are reported, with the α for all tests set at 0.05. Statistical analyses were performed with SAS statistical software (SAS/STAT User's Guide, Version 8, Cary, NC: SAS Institute Inc., 1999).

Results

Of the 107 women who submitted the survey over a 6-month period, one submitted an incomplete questionnaire, and three did not meet any of the diagnostic criteria for PSAS. Consequently, 103 subjects were enrolled in the study. Women were on average 39 years (mean ± SD, 38.9 ± 13.8 years, range 15–82), with the majority being heterosexual (83.5%), married (39.8%), in a long-term relationship (mean ± SD, 10.0 ± 12.3 years), well educated (mean ± SD, 14.5 ± 4.2 years), and in satisfactory to excellent health (93.2%). Most respondents (84.3%) were currently experiencing PSAS symptoms.

PSAS Criteria

Ninety-eight (98%) of respondents met at least one criterion for PSAS and 53% met all five criteria.

The most commonly endorsed criterion was involuntary genital and clitoral arousal that persists for an extended period of time (Table 1). There was a positive correlation between currently experiencing feelings of sexual arousal and four of the five symptom criteria. In a logistic regression with all five criteria in the model, only persistent genital arousal was significant ($P = 0.018$).

Symptom Description

The mean (±SD) duration of symptoms was 7.0 ± 9.4 years, and 84.3% of respondents were currently experiencing symptoms. Symptoms occurred continuously in 8.1% of women, regularly in 29.7%, occasionally in 52.7%, and rarely in 9.5%. Symptoms varied in intensity for most women (91.3%), generally included symptom-free periods (79.4%), and were viewed as intense (mean ± SD, 3.7 ± 1.0, where 1 = faint to 5 = overwhelming). Women were moderately distressed by their symptoms (mean ± SD, 6.2 ± 3.0) (1 = not at all distressed to 10 = extremely distressed). Twenty-five percent of women reported low distress (rated 1–3), 35% reported moderate distress (rated 4–7), and 40% reported high distress (rated 8–10).

Most women reported vasocongestive symptoms, such as congestion (74.8%), tingling (78.6%), wetness (75.7%), throbbing (72.2%), and contractions (70.9%) in the genitals. About one-third of women (35.4%) reported pain in both the clitoral and vaginal areas. Pain was experienced with penetration in 45.7%, without penetration in

Table 1 Percent of subjects meeting PSAS symptom criteria

PSAS symptom criterion	Percent (N)	Correlation coefficient (r)*
Involuntary genital and clitoral arousal that persists	91.26 (94)	0.0004
Genital arousal unrelated to sexual desire	82.35 (84)	0.008
Genital arousal not relieved with orgasms	83.33 (85)	0.138
Cause for PSAS cannot be identified	73.27 (74)	0.001
Genital arousal feels intrusive and unwanted	68.32 (69)	0.004

* Correlation between currently experiencing feelings of sexual arousal and each of the symptom criteria.

Table 2 Original and/or current PSAS triggers reported in over 10% of respondents*

Type of trigger	Original trigger (%/N)†	Current trigger (%/N)‡
Sexual stimulation	49.51 (51)	53.40 (55)
Masturbation	37.86 (39)	35.92 (37)
Stress	33.98 (35)	45.63 (47)
Anxiety	29.13 (30)	33.98 (35)
Loss	13.59 (14)	12.62 (13)
Menses	6.80 (7)	21.36 (22)

* Original and/or current triggers reported in less than 10% of respondents: medication, urinary tract infection, menopause, pregnancy, surgery, going on hormones, medical condition, recreational drug use, going off hormones, and injury.
† Percent (number) of subjects reporting activity as original trigger of symptoms.
‡ Percent (number) of subjects reporting activity as current trigger of symptoms.

28.6%, and with both activities in 25.7%. Over 40% (43.7%) of respondents reported experiencing nipple erection, a nongenital sensation.

PSAS Triggers

Physical sensations (sexual stimulation, masturbation) and psychological reactions (stress, anxiety) were the most common triggers of symptoms (Table 2). Tactile stimulation was most frequently reported to exacerbate symptoms, but visual stimulation was also observed (Table 3). Masturbation and intercourse both worsened symptoms (Tables 2 and 3) and provided relief (Table 4). Some respondents provided open-ended comments wondering if overly intense or insistent clitoral or vaginal manual or oral stimulation or masturbation was an original "trigger" for the condition of persistent arousal.

Orgasms provided some relief in almost half of women (Table 4). However, orgasms eliminated symptoms in only 13% (12.9%), and over five orgasms were necessary to quell feelings of genital arousal (mean ± SD, 5.2 ± 3.6). Over one-fourth (27.8%) required at least one-half hour to reach an orgasm, and 52.6% reported needing more physical pressure over time to achieve an orgasm.

Table 3 Activities associated with symptom exacerbation

Activity	Percent/(N)*
Pressure against genitals	66.99 (69)
Something you see (sexy)	59.22 (61)
Vibrations from car, motorcycle, etc.	57.28 (59)
Stimulation by partner	55.34 (57)
Intercourse	45.63 (47)
Prior to menses (premenstrual syndrome)	37.86 (39)
Genitals becoming too hot	30.10 (31)
Riding a horse or bicycle	27.18 (28)
Something you see (nonsexy)	12.62 (13)

* Percent (number) of subjects reporting activity.

Many women (45.9%) viewed the process as either painful or physically distressing, and 10.2% suspected they may have damaged themselves physically by self-stimulation. More women relied on manual (91.4%) than on mechanical or electrical devices (60.7%) for self-stimulation. Other activities associated with symptomatic relief are identified in Table 4. Although not provided as an option, three women reported that meditation and prayer were helpful.

Health History and Status

Two-thirds of the women were premenopausal (71.7%), and 62% had been pregnant, with 43% having had a vaginal delivery and 8% having had a c-section. Trauma to the genital area (18.6%) and episiotomy repair (11.7%) were more commonly reported than hysterectomies, oophorectomies, tubal ligations, and pelvic floor surgeries (1.9%–5.8%). Of those receiving medications, approximately one-third (30.1%) were using oral contraceptives and 15.5% were on hormone replacement therapy. Only 48% of respondents answered the question about "use of antidepressants," but of those respondents, all answered affirmatively.

Even though most women reported their physical health as satisfactory to excellent, many described themselves as worriers (61.8%) and felt they carried a lot of stress in their body (67.7%). A substantial percent of women reported a depressed mood (42.7%), anxiety/panic attacks (31.1%), headaches (23.3%), obsessive thoughts/behaviors (22.3%), or hypertension (13.6%). Myocardial infarctions, angina pectoris, stroke, diabetes, seizure disorders, and hypothyroidism occurred in less than 10% of respondents.

Table 4 Activities associated with some symptomatic relief in over 10% of respondents*

Activity	Percent (N) (some relief)†	Percent (N) (most relief)‡
Medication	52.00 (13)§	3.92 (4)
Masturbation	51.46 (53)	32.04 (33)
One or more orgasms	49.51 (51)	33.98 (35)
Distraction	38.83 (40)	8.74 (9)
Intercourse	35.92 (37)	17.48 (18)
Physical exercise	25.24 (26)	11.65 (12)
Cold compresses	12.62 (13)	3.88 (4)

* Activities associated with some symptomatic relief in less than 10% of respondents: numbing agents, antianxiety medication, abstinence, psychotherapy, and massage therapy.
† Percent (number) of subjects reporting some relief from activity.
‡ Percent (number) of subjects reporting most relief from activity.
§ Seventy-eight subjects did not answer question.

Table 5 Emotional reactions to PSAS

Feeling	Percent (N)*
Distracted	75.73 (78)
Frustrated	65.05 (67)
Weird	52.43 (54)
Concerned	51.46 (53)
Embarrassed	50.49 (52)
Sexy	39.81 (41)
Worried	36.89 (38)
Desirable	33.98 (35)
Guilty	32.04 (33)
Depressed	31.07 (32)
Ashamed	31.07 (32)
Unwell	28.16 (29)
Pleased	28.16 (29)
Feel youthful/young	20.39 (21)
Happy	19.42 (20)
Glad	17.48 (18)

* Percent (number) of subjects reporting feeling.

Feelings Associated with PSAS

Wide ranges of negative and positive feelings were associated with the experience of persistent arousal (Table 5). In fact, open-ended comments suggested that many women felt extremely upset, anxious, and depressed about their insistent feelings of genital arousal.

Predictors of Distress

Multiple regression analysis revealed that the strongest predictors of level of distress were intrusive symptoms ($P < 0.0001$), unhappiness ($P < 0.03$), shame ($P < 0.0001$) and worry ($P = 0.01$) about symptoms, enjoyment of symptoms some of the time ($P = 0.01$), relationship status ($P < 0.004$), reduced sexual satisfaction ($P < 0.004$), and continuous symptoms ($P < 0.001$). These five independent variables explained 75% of the variance in distress level ($R^2 = 0.749$, $P < 0.0001$). Greater levels of distress were associated with experiencing genital arousal as intrusive and unwanted, feeling ashamed, unhappy, and worried about the physical sensations, having continuous as opposed to intermittent symptoms, and enjoyment of the sensations of arousal some of the time as opposed to always or never. Those women who were single with a current sexual partner and who were satisfied with their sexual life were least likely to be distressed.

Overall Life and Sexual Satisfaction

Respondents reported moderate levels of sexual life satisfaction (mean ± SD, 5.4 ± 3.2) and general life satisfaction (mean ± SD, 5.7 ± 2.6) (1 = very dissatisfied and 10 = very satisfied). Women who were sexually satisfied were more generally satisfied with life ($r = 0.52$, $P \leq 0.0001$).

Discussion

This study supports earlier work suggesting the presence of a little noted aspect of female sexuality, namely persistent genital arousal in the absence of conscious feelings of sexual desire which is unrelieved by one or more orgasms. The fact that 103 women from all over the world responded to a survey over a 6-month period suggests that there are probably many others who experience this condition. At this time, it is impossible to determine the actual prevalence of PSAS since clinicians do not generally take a detailed sexual history from their patients and women are too embarrassed or ashamed to spontaneously initiate sexual concerns.

The results of this study support the validity of the original a priori description of PSAS. Of those women who went to the website and submitted the questionnaire, 98% met at least one criterion for PSAS and 53% met all five criteria. The most commonly endorsed features were extended periods of involuntary genital arousal, unrelated to subjective feelings of sexual desire, and unrelieved by orgasms. These features, along with distress, appear critical to the diagnosis. However, they do not suggest an etiology.

At present, the major etiological hypotheses regarding the genesis of PSAS are: (i) central neurological changes (e.g., postinjury, specific brain lesion anomaly); (ii) peripheral neurological changes (e.g., pelvic nerve hypersensitivity or entrapment); (iii) vascular changes (e.g., pelvic congestion); (iv) mechanical pressure against genital structures; (v) medication-induced changes; and (vi) psychological changes (e.g., stress), or some combination of all five (I. Goldstein, personal communication, 2004). Our research suggests that psychological factors may be significant triggers of symptom exacerbation and are likely implicated in etiology as well.

It is noteworthy that one-third of women reported pain in the clitoral and vaginal areas. Although the mechanism is unknown, these respondents may constitute a subset of women where genital arousal (and pain) is increased by spontaneous hyperactivity of the bulbocavernous and levator ani muscles.

Although the majority of women found the symptoms of PSAS to be at least moderately distressing, there appeared to be a minority of women who reported only mild distress and positive emotional reactions to their genital arousal. These women were more likely to have a current

sexual partner, enjoy the sensations at least some of the time, and to be satisfied with their sexual life. This suggests that modest amounts of continuous genital arousal may be reassuring and validating to women as evidence of their sexual vitality or desirability. However, when symptoms are continuous, and when genital arousal is intense, and unrelieved by orgasm, PSAS is experienced as extremely distressful, and is associated with reduced overall sexual satisfaction.

There may be a comorbidity of PSAS with other psychological conditions such as depression, anxiety, obsessive thoughts, and behaviors. It is unknown whether these are a consequence or a cause of PSAS. What is clear is that a high percentage of women identified stress as a current trigger of symptom exacerbation. Feelings of unhappiness, shame, and worry were strong predictors of overall distress. For the most part, respondents did not attribute the etiology of their complaint to medication, genital injury, or surgery. Similarly, hormonal insufficiency or use did not appear to be implicated in the genesis or maintenance of the condition.

There are several limitations to this research. The sample size is somewhat small and perhaps nonrepresentative since the use of an Internet survey may have preselected more highly educated women and eliminated those lacking computer access or skills. It is also likely that more motivated or distressed women may have taken the time to complete the questionnaire and thus skewed the results to a more severely symptomatic population. Because this was a self-report study, recall may have been selective or respondents may not have been willing to express some attitudes or beliefs on such a sensitive topic. Conversely, the use of a website insured respondents anonymity and may have allowed respondents to more freely express their thoughts. Because the website was not designed to determine how many women accessed the site but did not submit the questionnaire, it is impossible to determine the actual response rate. It may have been low, thereby introducing bias. However, the objective of this research was not to identify prevalence or etiology, but rather to validate descriptive features of the heretofore putative diagnosis of PSAS and to generate ideas for subsequent research.

The reliability and validity of the questionnaire is unknown since it was not extensively tested before being posted. However, the questions appear to be logically appropriate, based on the first author's experience with this population and were modified based on the feedback of a small number of respondents. In the future, the instrument will be modified in order to help identify subtypes of the condition (e.g., those women who report comfort or pleasure with the feelings of genital arousal vs. those who are distressed) and to help identify possible etiologies.

The results of this study highlight the fact that female sexual response is both complex and poorly understood. Whereas until recently, the absence of genital or subjective arousal in women has received major research attention, the existence of the opposite complaint, namely excessive, persistent, and unbidden genital arousal, has been ignored. Nevertheless, the present research suggests that PSAS is a genuine condition, though one that has eluded a precise pathogenesis. It consists of definable and replicable features, namely involuntary and persistent sensations of genital and clitoral arousal that are unrelieved by one or more orgasms. The arousal seems to appear spontaneously and is unrelated to conscious feelings of sexual desire. As such, the provisional diagnosis in the revised definitions of women's sexual dysfunction appears valid.

There is a pressing need for more empirical research on this condition. If the cause(s) of the condition can be determined more precisely, treatment possibilities may follow. Women report trying many types of interventions but none, to date, have proven consistently effective. Orgasm appears to provide temporarily relief and distraction helps as well, but masturbation or sexual intercourse is associated with exacerbation as well as symptomatic relief. Due to the multifaceted nature of the etiology of PSAS, it is likely that both psychological and physical approaches to treatment will be most effective in treating the condition.

Finally, if the precise pathogenesis of PSAS can eventually be determined, it may shed light on more effective treatments of female genital arousal disorder, for example, if we understand what is responsible for excessive arousal, we may better understand how to treat deficient genital arousal.

Conclusions

An Internet survey verified diagnostic features of PSAS proposed by an expert panel. Predominantly negative emotions and distress were associated with this condition.

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