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A review of persistent genital arousal disorder: Symptoms, diagnosis, and treatment

Abhimanyu Singh[a] ✉ | **Bhagyesh Sapkale**[a] | **Anupama Sawal**[b]

[a]Medicine, Jawaharlal Nehru Medical College, Datta Meghe Institute of Higher Education and Research, Wardha, India.
[b]Anatomy, Jawaharlal Nehru Medical College, Datta Meghe Institute of Higher Education and Research, Wardha, India.

Abstract A medical disease known as persistent genital arousal disorder (PGAD) is the cause of chronic genital arousal. It usually has little to do with sexual desire and can be rather upsetting. The literature on PGAD, emphasizing symptoms, diagnosis, and treatment, is reviewed in this study. PGAD is a condition about which there is still much to understand. However, research has linked it to OAB, restless leg syndrome, certain medications, and problems with the spinal cord. Diagnosis depends on the ability to distinguish between physically exhibited arousal and sexual desire, which is motivated by psychology. Current treatment options include education campaigns, counseling, medication, and potential spinal triggers. Other more invasive therapies have also been used, such as clitoridectomy and pudendal nerve ablation, but their success rates have varied.

Keywords: PGAD, genital syndrome, hypersexuality, genital arousal

1. Introduction

Patients suffering from persistent genital arousal disorder (PGAD) are female and experience stress-inducing persistent genital arousal that is triggered by both nonsexual and sexual stimuli and is not eased by orgasms. It is a sexual disorder that can impact both genders. It may affect 1-4% of the total earth population of humans (Kapuśniak & Piegza, 2022). The primary origin of PGAD is unknown, although its etiology involves a complex interplay of blood vessels and neural, physiological, psychological, pharmacologic, dietary, and mechanical factors. The marker of PGAD is persistent, unwanted arousal of the vagina and clitoris. Severe mental health issues such as suicidal thoughts, catastrophizing, and uncontrolled emotions have been linked to this disease (Goldstein et al., 2021). In 2001, the first case of PGAD was identified, but its exact nature is still not understood. Females are also mostly affected by eating disorders, which are serious mental issues (Imgart et al., 2022). They mostly cause physical side effects in addition to a high occurrence of psychosocial features (Zhang et al., 2022). PGAD is also known as genito-pelvic dysesthesia (GPD). There could be various factors that influence PGAD. The origin of PGAD has been linked to many factors, including the central nervous system (CNS), pharmacological medicines, spinal cord issues, psychosocial features, and microscopic sensory neuropathy of the pudendal nerve (Jackowich & Pukall, 2020). The signs can be unpleasant, uncomfortable, and unwelcome. Importantly, suffering, being alone, guilt, and suicidal thinking are mostly associated with PGAD. In certain subgroups of women, a variety of factors may play a role in the development of PGAD; various biopsychosocial factors or etiological factors are most likely involved. Among these proposed causes are vascular alterations, meningeal cysts (usually Tarlov cysts), central and peripheral dysregulation, and pharmacological and psychological variables (Cohen, 2017). Excessive desire, with or without ongoing genital arousal, is the root cause of hypersexuality. The main distinction between the two is that the absence of desire is a symptom of persistent genital arousal (PSAS). Embarrassment and humiliation likely play a role in the decision of those who have this incredibly rare illness not to disclose it (Aswath et al., 2016). The results indicated that treatment for PGAD/GPD symptoms and signs was costly and challenging. Furthermore, anxiety during PGAD/GPD discussions with a medical professional has been associated with a rise in depressed and restless symptoms (Jackowich, Boyer, et al., 2021). The main cause of PGAD is accidental C-fiber activation in the specific, restricted sensory neurons that sustain a sexual drive. Certain symptoms of PGAD may also be caused by the same pathophysiological mechanisms that underlie neuropathic pain and itching (Oaklander et al., 2020).

2. Materials and Methods

The persistent genital arousal disorder (PGAD) study included a comprehensive search of published material. I searched reliable databases for relevant studies. Our search was performed with free-text keywords, including "PGAD," "Persistent Sexual Arousal Syndrome," "Symptoms," and "Treatment", together with Medical Subject Headings (MeSH) terms. From 2001 to 2023, peer-reviewed articles and case reports were the main sources of data used in this investigation. They focused on describing the symptoms, diagnosis, and management of PGAD in both sexes. Commentaries and nonpeer

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reviewed studies were excluded from our selection criteria, as were publications that were available only in English. I checked the article names and abstracts for relevancy after eliminating duplicates. The criteria-compliant full-text articles underwent a thorough evaluation process. By closely scrutinizing each study, details about the research were acquired, including the authors, publication year, study design, key findings, and conclusions. The researchers used risk assessment techniques such as the Newcastle–Ottawa Scale and the Cochrane Risk of Bias Tool to confirm the validity of their study. We also reviewed the references of the articles to ensure that no important research was overlooked. In the end, thirty notable references were incorporated into the research, indicating the extent of the study. Considering how dynamic PGAD research is, these exacting techniques are essential.

3. Discussion

3.1. Neurological and psychiatric factors in PGAD

Spontaneous, continuous, and irrepressible genital excitation—which can occur with or without an orgasm or genital enlargement and is unrelated to sensations of desire for sex—is a symptom of restless genital syndrome or persistent genital arousal disorder (PGAD). After Leiblum and Nathan first described the illness in 2001 under the name persistent sexual arousal syndrome (PSAS) (Eibye & Jensen, 2014), Goldmeier renamed the condition persistent sexual arousal disorder (PGAD) in 2009. Although the exact cause of PGAD is still unknown, it has been demonstrated to occur after stopping SNRIs and selective serotonin reuptake inhibitors (SSRIs). A prevalent and frequently upsetting issue that lowers women's quality of life and medication compliance is sexual dysfunction. Because the illness is typically complicated, a multidisciplinary approach to diagnosis and therapy is necessary, taking into account biological, psychological, social, and relationship aspects (Faubion & Rullo, 2015). The associated unsettling elements include restless legs syndrome and signs of an overactive bladder. In a clinical study, Waldinger and Schweitzer reported that shaking legs occurred in 67% of 18 women with a final diagnosis of PGAD (Parus et al., 2020). Similar to postural instability disorder (PGAD), restless leg syndrome symptoms intensify in response to immobility and improve with lower limb movement or stimulation. The majority of these women in the study also showed symptoms of an overactive bladder, including irritability and frequent urination. It is known that spinal cord disease has a distinct etiology that may be the source of PGAD symptoms. Above the L1/L2 location of termination of the spine, the most frequently injured or traumatized part of the spinal cord is the thoracic or cervical spinal cord (Scantlebury & Lucas, 2023). It is uncertain what causes PGAD and what pathophysiology it follows. Monoamine neurotransmitters and the control of the sexual response are related. Sexual function is inhibited by serotonin synthesis in the pons and midbrain (Faruqui et al., 2023). It is well known that serotonergic nuclei in the brainstem prevent orgasm. Narcolepsy, temporal lobe epilepsy, and genito-pelvic dysesthesia (GPD) are a few of the conditions that may result in sexual illusions (Blom & Mangoenkarso, 2018). An overview of persistent genital arousal disease is provided in (Table 1).

Table 1 An overview of persistent genital arousal disease.

Factor	Details
Symptoms	Spontaneous, continuous, and irrepressible genital excitation with or without orgasm or genital enlargement, unrelated to sexual desire.
Previous Names	Persistent sexual arousal syndrome (PSAS) (2001)
Current Name	Persistent genital arousal disorder (PGAD) (2009)
Possible Causes	Stopping SNRIs or SSRIs, Parkinson's disease, spinal cord disease, dysfunction in monoamine neurotransmitter systems.
Associated Conditions	Restless legs syndrome, overactive bladder, narcolepsy, temporal lobe epilepsy, genito-pelvic dysesthesia.
Treatment Approach	Multidisciplinary, considering biological, psychological, social, and relationship aspects.

3.2. Psycho-Somatic impact of PGAD

Anular rips, herniated disks, and spinal stenosis are examples of pathologies that can impact the spinal cord in a manner akin to that of the cauda equina. The patient claimed that high levels of worry frequently resulted in PGAD/GPD symptoms, and she blamed the COVID-19 pandemic's stress on the condition's development (Merwin & Brotto, 2023). She suffered from PGAD and was unable to wear pants or sit for extended periods of time for eighteen months. The patient said that their anxiety and PGAD symptoms worsened when they were exposed to excessive lighting, music, and television. After the onset of PGAD/GPD symptoms, the patients experienced severe humiliation, social isolation, heightened anxiety for three months, and recurrent suicidal thoughts for eight months. All of these symptoms indicate a serious depressive condition. Patients with PGAD are frequently seen at pain clinics. Many women will participate in online support groups; others may have tried drastic measures in the past. PGAD is characterized by prolonged (hours, days, or months) spontaneous stimulation of the genital organs, undesired arousal, distressing messages, persistent arousal without an orgasm, and spontaneous arousal without a sexual desire (Hrynko et al., 2017). The term "PGAD/GPD" refers to painful, undesired, and recurrent episodes of genital arousal that may also include other types of genito-pelvic dysesthesia (such as buzzing and tingling). Apart from the clitoris, symptoms associated with the clitoris can also be felt in other genito-pelvic

areas (e.g., the mons pubis and urethra), such as sensations of impending orgasm, intense orgasm, and frequent orgasms (Mooney et al., 2022).

3.3. Differential diagnoses for PGAD

Patients with PGAD have undergone a wide range of treatments, including nerve stimulation, electroconvulsive therapy (ECT), physiotherapy, psychotherapy, antiandrogens, benzodiazepines, antipsychotics, and anticonvulsive drugs. Psychosomatic sickness, obsessive-compulsive disorder, and nonspecific genital organic pathology are possible differential diagnoses for PGAD (Gadit, 2013). A complicated condition known as persistent genital arousal disorder (PGAD) causes arousal symptoms in the body, such as increased blood flow to the genitalia, but not the emotional desire for sexual activity. This suggests that the intellect can be "aroused" even in the absence of interest from the body. Certain arousal symptoms can be elicited by overtly sexual stimuli, whereas nonsexual occurrences such as garment friction or buzzing cell phones can cause other arousal symptoms. In certain cases, the cause is still unknown, and arousal occurs suddenly. One of the main characteristics of PGAD is its chronic arousal, which frequently lasts for hours or even days following an orgasm and does not go away. The characteristics of PGAD are outward signs of genital arousal in the absence of corresponding mental desire. This could be clearly triggered, or it could be induced in a nonsexual or sexual way. Even after having one or more orgasms, arousal can produce excruciating agony and last unabatedly for hours or days (*Persistent Genital Arousal Disorder*, n.d.).

3.4. Treatment approaches for PGAD

Given their ability to numb the vagina, gabapentinoids, opioids, botox, and SSRIs were likely part of the treatment plan, along with more extreme measures, including clitoridectomy and pudendal nerve ablation (Healy et al., 2022). The indirect GABA receptor agonist zolpidem, which is not a benzodiazepine, has been occasionally used as a treatment for PGAD in recent years (Ferenidou et al., 2019). An emerging diagnosis in women is persistent genital arousal disorder (PGAD). It is defined as an unwelcome, extended genital arousal that persists after an orgasmic encounter and is not caused by sexual desire. It is anticipated that 1% of young women will be impacted (Stevenson & Köhler, 2015). In females, PGAD has only ever been diagnosed once. A male has been reported to have signs of PGAD. However, they belong to a different group of diseases. PGAD is treated with medications that modulate dopamine-related signaling pathways. One direct-acting channel blocker that induces feedback inhibition is pramipexole (Lynn et al., 2021). Second, restrictions on their effectiveness include cooccurring treatments that lessen their capacity to exert a calming effect on overexcited dopaminergic transmission. Treatment options for the rare sex condition known as PGAD include clomipramine, fluoxetine, lignocaine gel, and various pelvic floor exercises. Injectable leuprolide is particularly advised when used in conjunction with the aforementioned treatments (Deka et al., 2015). Treatment for PGAD with CPN may be successful (Aoun et al., 2021). Exercises that strengthen the pelvic floor have been shown to alleviate vulvodynia and other genito-pelvic pain. They might also be helpful for those who have PGAD/GPD (Jackowich, Mooney, et al., 2021). Treatment approaches for PGAD are described in Table 2.

Table 2 Treatment approaches for PGAD.

Treatment Approaches for PGAD	Description
Gabapentinoids, Opioids, Botox, SSRIs	Used for their ability to numb the vagina and alleviate symptoms.
Clitoridectomy and Pudendal Nerve Ablation	Extreme measures that may be considered in severe cases as part of the treatment plan.
Zolpidem	Indirect GABA receptor agonist occasionally used in recent years for PGAD associated with Parkinson's.
Pramipexole	Direct-acting channel blocker modulating dopamine-related signaling pathway.
Co-occurring Treatments	Effectiveness may be limited by treatments reducing their calming effect on overexcited dopaminergic transmission.
Clomipramine, Fluoxetine, Lignocaine Gel	Medications for managing PGAD symptoms.
Injectable Leuprolide	Recommended, especially when used alongside other treatments.
Treatment with CPN (Clitoral Phrenic Nerve)	May be successful in alleviating PGAD symptoms.
Pelvic Floor Exercises	Shown to be beneficial for vulvodynia, genito-pelvic pain, and may also help with PGAD/GPD.

There are various treatment options available for persistent genital arousal disorder (PGAD). One such tactic is the diagnosis and treatment of spinal cord cysts or lower back diseases. By lowering the underlying triggers, this strategy aims to treat any potential physical causes of PGAD. Patients and medical professionals can also look at other psychotherapy techniques, such as cognitive behavioral therapy (CBT) (*Persistent Genital Arousal Disorder (PGAD)*, 2016). Neuromodulation may very infrequently alleviate PGAD symptoms, and there is no evidence that hyperarousal symptoms are a harmful side effect following sacral neuromodulator implantation or that they persist even after the implant is removed (Zoorob et al., 2019). Clinically, peripheral vaginal illnesses with underlying balanitis connected to closed compartment syndrome, such as clitorodynia caused by clitoral adhesions, can be identified in women with PGAD. Some women with clitoral adhesions and G.P.D. may benefit from local clitoral medical therapy. Electroconvulsive therapy (ECT) can alter cerebral excitatory and

inhibitory neurotransmitter levels both temporarily and permanently. E.C.T. can therefore be used to manage PGAD (Korda et al., 2009).

4. Final considerations

The complicated and poorly understood syndrome known as persistent genital arousal disorder (PGAD) is characterized by prolonged and spontaneous genital arousal, which has a substantial negative influence on quality of life. Although knowledge has progressed since its early 21st century, the exact etiology and pathogenesis are still unknown. Differentiating between physical arousal and psychological desire necessitates a sophisticated diagnosis, with suggested triggers ranging from drugs to spinal abnormalities. Treatment options include investigating therapies such as pramipexole, addressing possible medical reasons, and using psychological methods such as CBT. Exercises for the pelvic floor are also promising. A multidisciplinary approach is being used in research to improve therapies, reduce symptoms, and eventually increase quality of life for people with PGAD.

Ethical considerations

Not Applicable.

Conflict of Interest

The authors declare no conflicts of interest.

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References

Aoun, F., Alkassis, M., Tayeh, G. A., Chebel, J. A., Semaan, A., Sarkis, J., Mansour, R., Mjaess, G., Albisinni, S., Absil, F., Bollens, R., & Roumeguère, T. (2021). Sexual dysfunction due to pudendal neuralgia: A systematic review. *Translational Andrology and Urology*, *10*(6), 2500–2511. https://doi.org/10.21037/tau-21-13

Aswath, M., Pandit, L. V., Kashyap, K., & Ramnath, R. (2016). Persistent Genital Arousal Disorder. *Indian Journal of Psychological Medicine*, *38*(4), 341–343. https://doi.org/10.4103/0253-7176.185942

Blom, J. D., & Mangoenkarso, E. (2018). Sexual Hallucinations in Schizophrenia Spectrum Disorders and Their Relation With Childhood Trauma. *Frontiers in Psychiatry*, *9*, 193. https://doi.org/10.3389/fpsyt.2018.00193

Cohen, S. D. (2017). Diagnosis and Treatment of Persistent Genital Arousal Disorder. *Reviews in Urology*, *19*(4), 265–267. https://doi.org/10.3909/riu0784

Deka, K., Dua, N., Kakoty, M., & Ahmed, R. (2015). Persistent genital arousal disorder: Successful treatment with leuprolide (antiandrogen). *Indian Journal of Psychiatry*, *57*(3), 326–328. https://doi.org/10.4103/0019-5545.166633

Eibye, S., & Jensen, H. M. (2014). Persistent Genital Arousal Disorder: Confluent Patient History of Agitated Depression, Paroxetine Cessation, and a Tarlov Cyst. *Case Reports in Psychiatry*, *2014*, 529052. https://doi.org/10.1155/2014/529052

Faruqui, Z., Meckley, G., Jain, A., & Fluyau, D. (2023). On the Borderline of Pleasure and Pain: Comorbid Persistent Genital Arousal Disorder and Borderline Personality Disorder. *The Primary Care Companion for CNS Disorders*, *25*(1), 22cr03281. https://doi.org/10.4088/PCC.22cr03281

Faubion, S. S., & Rullo, J. E. (2015). Sexual Dysfunction in Women: A Practical Approach. *American Family Physician*, *92*(4), 281–288.

Ferenidou, F., Mourikis, I., Sotiropoulou, P., & Vaidakis, N. (2019). Zolpidem related persistent genital arousal disorder: An interesting case. *Psychiatrike = Psychiatriki*, *30*(4), 339–344. https://doi.org/10.22365/jpsych.2019.304.339

Gadit, A. (2013). Persistent genital arousal disorder: A clinical challenge. *Case Reports*, *2013*, bcr2013009098. https://doi.org/10.1136/bcr-2013-009098

Goldstein, I., Komisaruk, B. R., Pukall, C. F., Kim, N. N., Goldstein, A. T., Goldstein, S. W., Hartzell-Cushanick, R., Kellogg-Spadt, S., Kim, C. W., Jackowich, R. A., Parish, S. J., Patterson, A., Peters, K. M., & Pfaus, J. G. (2021). International Society for the Study of Women's Sexual Health (ISSWSH) Review of Epidemiology and Pathophysiology, and a Consensus Nomenclature and Process of Care for the Management of Persistent Genital Arousal Disorder/Genito-Pelvic Dysesthesia (PGAD/GPD). *The Journal of Sexual Medicine*, *18*(4), 665–697. https://doi.org/10.1016/j.jsxm.2021.01.172

Healy, D., Bahrick, A., Bak, M., Barbato, A., Calabrò, R. S., Chubak, B. M., Cosci, F., Csoka, A. B., D'Avanzo, B., Diviccaro, S., Giatti, S., Goldstein, I., Graf, H., Hellstrom, W. J. G., Irwig, M. S., Jannini, E. A., Janssen, P. K. C., Khera, M., Kumar, M. T., … Waraich, A. (2022). Diagnostic criteria for enduring sexual dysfunction after treatment with antidepressants, finasteride and isotretinoin. *The International Journal of Risk & Safety in Medicine*, *33*(1), 65–76. https://doi.org/10.3233/JRS-210023

Hrynko, M., Kotas, R., Pokryszko-Dragan, A., Nowakowska-Kotas, M., & Podemski, R. (2017). Persistent genital arousal disorder—A case report. *Psychiatria Polska*, *51*(1), 117–124. https://doi.org/10.12740/PP/64869

Imgart, H., Zanko, A., Lorek, S., Schlichterle, P.-S., & Zeiler, M. (2022). Exploring the link between eating disorders and persistent genital arousal disorder/genito-pelvic dysesthesia: First description and a systematic review of the literature. *Journal of Eating Disorders*, *10*(1), 159. https://doi.org/10.1186/s40337-022-00687-7

Jackowich, R. A., Boyer, S. C., Bienias, S., Chamberlain, S., & Pukall, C. F. (2021). Healthcare Experiences of Individuals With Persistent Genital Arousal Disorder/Genito-Pelvic Dysesthesia. *Sexual Medicine*, *9*(3), 100335. https://doi.org/10.1016/j.esxm.2021.100335

Jackowich, R. A., Mooney, K. M., Hecht, E., & Pukall, C. F. (2021). Online Pelvic Floor Group Education Program for Women With Persistent Genital Arousal Disorder/Genito-Pelvic Dysesthesia: Descriptive Feasibility Study. *JMIR Formative Research*, *5*(1), e22450. https://doi.org/10.2196/22450

Jackowich, R. A., & Pukall, C. F. (2020). Prevalence of Persistent Genital Arousal Disorder in 2 North American Samples. *The Journal of Sexual Medicine*, *17*(12), 2408–2416. https://doi.org/10.1016/j.jsxm.2020.09.004

Kapuśniak, N. E., & Piegza, M. (2022). Persistent genital arousal disorder—The present knowledge. *Psychiatria Polska*, *56*(6), 1203–1219. https://doi.org/10.12740/PP/OnlineFirst/135253

Korda, J. B., Pfaus, J. G., Kellner, C. H., & Goldstein, I. (2009). Persistent genital arousal disorder (PGAD): Case report of long-term symptomatic management with electroconvulsive therapy. *The Journal of Sexual Medicine*, *6*(10), 2901–2909. https://doi.org/10.1111/j.1743-6109.2009.01421.x

Lynn, B. K., Grabenhorst, C., Komisaruk, B. R., Goldstein, I., & Pfaus, J. (2021). The Use of Pramipexole to Treat Persistent Genital Arousal Disorder: A Case Report. *Sexual Medicine*, *9*(4), 100372. https://doi.org/10.1016/j.esxm.2021.100372

Merwin, K. E., & Brotto, L. A. (2023). Psychological Treatment of Persistent Genital Arousal Disorder/Genitopelvic Dysesthesia Using an Integrative Approach. *Archives of Sexual Behavior*, *52*(5), 2249–2260. https://doi.org/10.1007/s10508-023-02617-3

Mooney, K. M., Poirier, É., & Pukall, C. F. (2022). Persistent Genital Arousal in Relationships: A Comparison of Relationship, Sexual, and Psychological Well-Being. *The Journal of Sexual Medicine*, *19*(2), 234–248. https://doi.org/10.1016/j.jsxm.2021.10.009

Oaklander, A. L., Sharma, S., Kessler, K., & Price, B. H. (2020). Persistent genital arousal disorder: A special sense neuropathy. *Pain Reports*, *5*(1), e801. https://doi.org/10.1097/PR9.0000000000000801

Parus, A., Kanhai, M., & Tramont, J. M. (2020). Persistent Genital Arousal Disorder After Motor Vehicle Accident: A Case Report. *Women's Health Reports (New Rochelle, N.Y.)*, *1*(1), 341–344. https://doi.org/10.1089/whr.2020.0043

Persistent Genital Arousal Disorder: Causes & Treatment. (n.d.). Cleveland Clinic. Retrieved 4 May 2024, from https://my.clevelandclinic.org/health/diseases/23998-persistent-genital-arousal-disorder

Persistent Genital Arousal Disorder (PGAD): Symptoms and Treatment. (2016, July 31). Psych Central. https://psychcentral.com/disorders/persistent-genital-arousal-disorder

Scantlebury, M., & Lucas, R. (2023). Persistent Genital Arousal Disorder: Two Case Studies and Exploration of a Novel Treatment Modality. *Women's Health Reports (New Rochelle, N.Y.)*, *4*(1), 84–88. https://doi.org/10.1089/whr.2022.0097

Stevenson, B. J., & Köhler, T. S. (2015). First Reported Case of Isolated Persistent Genital Arousal Disorder in a Male. *Case Reports in Urology*, *2015*, e465748. https://doi.org/10.1155/2015/465748

Zhang, Y., Su, L., Ge, H., & Wang, Q. (2022). Persistent Genital Arousal Disorder/Genito-Pelvic Dysesthesia caused by Sacroiliac Joint Dysfunction. *Sexual Medicine*, *10*(5), 100544. https://doi.org/10.1016/j.esxm.2022.100544

Zoorob, D., Deis, A. S., & Lindsay, K. (2019). Refractory Sexual Arousal Subsequent to Sacral Neuromodulation. *Case Reports in Obstetrics and Gynecology*, *2019*, e7519164. https://doi.org/10.1155/2019/7519164