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SEX ADDICTION (S KRAUS, SECTION EDITOR)

Behavioral and Pharmacological Treatment of Compulsive Sexual Behavior/Problematic Hypersexuality

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Abstract
Purpose of the Review The present article summarizes the available evidence to date on the pharmacological and behavioral treatment of compulsive sexual behavior/problematic hypersexuality and provides two case vignettes to illustrate potential approaches to treating different presentations of problematic sexual behavior in patients.
Recent Findings To date, some evidence supports the use of several medications, such as selective serotonin reuptake inhibitors and naltrexone, as well as certain therapy techniques, including marital therapy, acceptance and commitment therapy, and cognitive behavioral therapy.
Summary Unfortunately, little controlled research has been conducted or reported on optimal treatments for patients struggling to manage their problematic sexual behavior. Limited evidence for some options has been reported, but additional controlled, blinded research will be necessary to improve the specificity and quality of available care.

Keywords Compulsive sexual behavior · Treatment · Hypersexuality · Pharmacology · Psychotherapy

Introduction

Compulsive sexual behavior (CSB) is a term that characterizes repetitive and intense preoccupations with sexual fantasies, urges, and behaviors that are distressing to the individual and/or result in psychosocial impairment. Individuals with CSB often perceive their sexual behavior to be excessive but are unable to control it. They act out impulsively (act on impulses and lack impulse control) or compulsively (are plagued by intrusive obsessive thoughts and driven behaviors). CSB can involve fantasies and urges in addition to or in place of the behavior, but must rise to a level of clinically significant distress and interference in one's daily life to qualify as a disorder.

Given the lack of large-scale, population-based epidemiological studies assessing CSB, its true global prevalence among adults is currently unknown. One US university-based survey found estimates of CSB to be approximately 2 % [1•]. Others have estimated the prevalence to be from 3 to 6 % of adults in the USA [1•, 2]. It also appears that males comprise the majority (80 % or higher) of affected individuals [3].

CSB can be subdivided into three clinical elements: repeated sexual fantasies, repeated sexual urges, and repeated sexual behaviors [4].One study found that 42 % of their sample had trouble controlling their sexual fantasies, 67 % reported difficulties with sexual urges, and 67 % engaged in repeated sexual behaviors that they felt were out of control [5]. Although a high percentage of people report gratification from the sexual behavior (e.g., 70 % felt gratification from the behavior and 83 % felt a release of tension afterwards), guilt or remorse often follows these behaviors [6]. While terminology and specific diagnostic criteria have varied over the years, depictions resembling CSB have persisted since the 18th century, highlighting it as a notable psychiatric issue [7–9]. The following case vignettes provide two examples of how CSB symptoms may present in a clinical setting.

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Case Vignettes

Case #1

Paul is a 42-year-old heterosexual male and has been married to his wife for the past 23 years with whom he has two grade-school children. Over the past year, Paul has been showing increasingly prominent symptoms of depression, spending long periods of time secluded from the family, and struggling to complete his work as an accountant. After urging from his wife and children, Paul agreed to see a psychiatrist about his depression and problems with work. While meeting with the doctor, Paul noted that he has been feeling increasingly depressed, attributing this to feelings that he is an immoral person. Upon further inquiry, Paul revealed that he has been watching pornography and masturbating daily, perhaps several times a day, and that this behavior has increased in frequency over the past year. Eventually, he reached a point where he felt he could not control his urges to masturbate, even when in inappropriate locations such as his office at work. He considers himself a moral person, attends church regularly, and so this behavior is particularly troubling to him as it is contrary to what he believes his religion teaches him. As a result, Paul started feeling increasingly helpless and guilty about his behavior, describing his compulsive masturbation as "immoral" and his inability to control it as "personal weakness". Paul also notes that he has not told his wife about his problem because he worried that she would be upset with him for fear that the children would find out, culminating in an irreparable rift in the family. Paul emphasizes that he wants to stop his behavior before it causes problems with his work and family, but does not know how to control his urges, thus leading to escalating feelings of depression and despair.

Case #2

Reggie is a 28-year-old gay male who reports that he exclusively has sex with other men, both as a receptive and penetrative partner. During an appointment with his primary care physician, Reggie reported that he had been experiencing notable pain while urinating and had noticed discharge from his penis during the previous week. Following several tests, the doctor confirmed that Reggie had contracted gonorrhea, likely from a recent sexual partner. While discussing the treatment for gonorrhea with Reggie, his doctor also made a point of asking him about the types of protection he uses during sex and how many partners he has had recently. After being asked the additional questions, Reggie started to explain that he had been struggling to control his urges to go cruising over the last couple of months and had started having sex with a large number of partners he met at local bars and clubs, with whom he had almost entirely stopped using condoms for protection during intercourse. Reggie described his cruising behavior as "out of control," and described how he felt there was almost nothing he could do to stop himself from engaging in risky sex with partners he met. He also emphasized that while he often felt it was fun to meet partners, he also felt increasingly worried about the possible consequences of his behavior, and felt highly distressed that the behavior felt like it was out of his control.

Treatment Considerations

Diagnosis of CSB

Treatment for any mental health disorder starts with an accurate diagnosis. This is difficult in the case of CSB due to a lack of consensus about the diagnostic criteria for the disorder. CSB is currently not recognized in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), but during the DSM revision process, diagnostic criteria were proposed for hypersexuality Disorder [10]. In addition, during the DSM-5 discussion process, there was considerable debate concerning the relationship of CSB to substance addictions, and, in fact, the proposed diagnostic criteria for DSM-5 hypersexuality disorder seem to reflect those used for substance use disorders [11]. In addition to the proposed criteria for hypersexuality disorder, others have proposed criteria for CSB which are perhaps somewhat less restrictive [4]. Christenson and colleagues [4] developed alternative criteria for CSB as part of a larger survey of impulse control disorders [12], and the ICD-11 working group has proposed viewing CSB as being related to other disorders characterized by repeated failures to resist impulses and related factors [13].

In summary, all of these proposed approaches to diagnosis are somewhat similar. They all suggest that the core underlying issues involve sexual urges or behavior that are difficult to control and that the urges or behaviors lead to psychosocial dysfunction. The details of each, however, could result in different rates of CSB diagnosis, and therefore ultimately, research will need to determine which diagnostic approach is reflective of the neurobiology underlying CSB.

Misdiagnosis of CSB

Various mental health problems may include excessive sexual behavior as part of their clinical presentation, and it is important to differentiate that behavior from CSB. For example, excessive sexual behavior can occur as part of a manic episode in a person who has bipolar disorder. If the problematic sexual behavior also occurs when the person's mood is stable, the individual may have CSB in addition to bipolar disorder. This distinction is important because the treatment for bipolar disorder is often very different from that for CSB as anti-seizure medications have only case reports attesting to their use in CSB (see below).

Excessive sexual behavior can occur when a person is using drugs, particularly stimulants (such as cocaine, amphetamines) as well as gamma hydroxyl butyrate (GHB) [14]. If the sexual

behavior does not occur when the person is not using drugs, then the appropriate diagnosis would likely not be CSB. Similar precautions must be taken when considering whether symptom onset occurred after initiation of another medication, as previous reports have noted the potential for onset of excessive sexual behavior following initiation of pharmacological treatment for Parkinson's disease [15–18].

Pharmacological Treatments

Pharmacological treatment of CSB has been examined, but these reports consist primarily of small, open-label studies, case series, or retrospective analyses, with the exception of one double-blind, placebo-controlled study. Based on available evidence, however, there may be several notable treatment options available for patients with CSB. It should also be noted that none of the treatments discussed in this sections have been officially approved by the FDA to treat CSB specifically.

Antidepressants

Some of the most thoroughly documented pharmacological treatments for CSB are selective serotonin reuptake inhibitors (SSRIs), with a notable evidence base for fluoxetine, sertraline, and citalopram in particular [19, 20, 21•]. For the majority, however, evidence is limited to either individual case reports or small sample case-series/open-label studies.

Sertraline For sertraline, a couple cases have reported independent use for the treatment of CSB with effective doses ranging from 25 to 250 mg/day, in addition to an additional case report showing successful reduction of symptoms when combined with naltrexone [22, 23].

Fluoxetine Similar and more numerous case reports and open-label assessments on fluoxetine (20 to 60 mg/day) have suggested notable improvement in subjects both as an independent treatment and in combination with lamotrigine, although the subject of this case reported complicating comorbidities [24–26].

Paroxetine Data on paroxetine remains limited, with one case study suggesting a positive effect at 20 mg/day when used in conjunction with naltrexone [23].

Citalopram Citalopram has received the most extensive and thorough support for use with CSB, as it is the only treatment for CSB that has been assessed using a double-blind, placebo-controlled methodology. In this study, active citalopram was associated with significant decreases in CSB symptoms, including sexual desire/drive, frequency of masturbation, and pornography use [27]. The mean effective dose was 43 mg/day (range of 20 to 60 mg/day). It should be noted, however, that the study sample was exclusively comprised of men who have sex with men. Additional case reports have suggested similar findings, although generalizability may be limited, as one was in combination with topiramate in a patient with bipolar disorder type II, and the other patient had been diagnosed with precocious puberty and other health issues [28, 29].

In addition to SSRIs, several additional case reports have suggested that other antidepressant medications, such as SNRIs and tricyclic antidepressants, may be beneficial when treating CSB. One of the most notable of these is clomipramine. To date, several case reports have indicated significant improvement of CSB symptoms using clomipramine (doses reported as 150 mg/day), both as an independent treatment [30] and as a combined treatment with other treatment options such as valproic acid [31]. A retrospective study of nefazodone has also suggested that it may be another option for treating CSB, as patients reported notable reductions in the frequency of sexual obsessions/compulsions while taking the medication (mean dose of 200 mg/day; range dose of 50 to 400 mg/day), and showed no notable sexual performance side effects [32]. Another case report suggested that mirtazapine may be a useful treatment option, but the case was limited to a case in which mirtazapine (15 mg/day) was used in conjunction with naltrexone and covert sensitization [33]. Two additional cases suggest that imipramine (dose between 125 and 225 mg/day), both as an independent treatment and in combination with lithium, may be beneficial for patients with CSB [25]. Finally, one case report has noted the possible use of venlafaxine for CSB (150 mg 2x/day), although its potential utility is unclear as use was concurrent with sodium valproate and risperidone augmentations [34].

While available evidence regarding antidepressant use, and SSRIs in particular, to treat CSB has provided initial indications that it is a potentially beneficial treatment option, findings remain far from conclusive, with only one controlled trial, and only single subject case reports for many of the medication options. Despite the paucity of data, the potential efficacy of SSRIs is supported by findings in disorders that may share common clinical and neurobiological features with CSB, particularly obsessive-compulsive disorder (OCD). As previous data has suggested, the compulsive aspects of CSB may share common features with characteristics identified in OCD; thus, it is possible that CSB and OCD may share common pathways that may respond to similar treatment regimens [35]. Given this possibility, SSRIs would be an ideal category of medications for further assessment, as previous research in OCD has suggested that SSRIs, as well as clomipramine, elicit significant reductions in symptom severity, with several double-blind, placebo-controlled studies available to date [36].

Opioid Antagonists

In addition to SSRIs, naltrexone, an opioid antagonist, has received the most support from available cases, open-label studies,

and retrospective analyses. As with the other pharmacological options, many of the reports using naltrexone (doses ranging from 50 to 150 mg/day) have been in conjunction with other medications and treatments, particularly SSRIs, and one in combination with covert sensitization [23, 33, 37]. Cases have included a range of manifestations of CSB, as well as one case of CSB comorbid with kleptomania [38, 39••, 40, 41]. While evidence for the use of naltrexone remains limited to case reports and retrospective analyses, results to date have been positive, with both naltrexone alone and in combination with other treatment options showing notable decreases in CSB symptom severity. Successful use of naltrexone to treat other addictive disorders may also recommend its use, as behaviors such as alcohol use, nicotine use, and other addictions may share notable similarities with CSB (for a review see Berrettini, 2016 [42]).

Anti-convulsants and Mood Stabilizers

Several case reports have suggested that select anti-convulsant and mood-stabilizing medications may be beneficial for treating CSB. In particular, initial case reports have suggested that topiramate may be a particularly notable option, although findings are limited to individual case reports. In several case reports, the use of topiramate was associated with significant improvement in one, and complete cessation of CSB symptoms in the other [43, 44]. Another case report suggested that topiramate in combination with citalopram can help modulate CSB symptoms, although the patient also had a history of bipolar disorder type II, which limits generalizability [28]. Doses ranged from 50 to 200 mg/day. It should be noted that several of the case reports noted significant side effects while taking topiramate, eventually leading to discontinuation despite improvements in CSB symptoms.

Several other anti-convulsants and mood stabilizers have shown beneficial effects in individual case reports, often in conjunction with serotonergic medications. These include valproic acid [31, 34], lamotrigine [26], lithium [25], and levetiracetam [45]. Findings for these alternatives are even more limited, with only a couple cases available for each, and should be interpreted accordingly.

Other Medications

A variety of other medications have been used to treat CSB, but assessments have been limited to single open-label study or case report. One notable example is risperidone, an antipsychotic medication, which was used in conjunction with venlafaxine and sodium valproate to mediate CSB symptoms in a case report [34]. Another potential option for treatment of a very specific sub-set of patients with CSB is methylphenidate sustained release (SR) in combination with an SSRI, which has shown some efficacy in improving CSB symptoms in patients with a current comorbid diagnosis of ADHD [46]. This option should be assessed with caution, however, as many cases of CSB can be exacerbated by stimulant use, a class of drug which is also commonly abused to facilitate excessive sexual behavior. A final medication which could be considered after thorough risk/benefit assessment is triptorelin, a long-acting analog of gonadotropin-releasing hormone. In an open-label study, triptorelin was associated with significant decreases in amount of sexual activity and other symptoms associated with CSB [47]. This option should be considered with high levels of caution however, as it depletes testosterone levels which may have notable health implications.

From research on cocaine and cannabis addiction, as well as multiple compulsive behaviors such as trichotillomania, N-acetylcysteine (NAC), a natural supplement which likely modulates glutamate, may be a promising alternative (for a review see Deepmala et al., 2015 [48]). Similarly, research from the area of gambling disorder, another behavioral addiction, has suggested that both memantine, an NMDA-receptor antagonist, and tolcapone, a COMT inhibitor, may be useful approaches for mediating the severity of addictive/compulsive behaviors (for a review see Yau and Potenza, 2015 [49]). Positive findings in the area of gambling and kleptomania may indicate that these drugs may be yet other agents which merit exploration and assessment for use with CSB.

Therapeutic Treatments

As is the case for pharmacological treatments, evidence supporting specific types of psychotherapy for CSB remains limited, and is largely drawn from open-design studies and small-sample reports. Additionally, the scant literature on psychotherapy for CSB is comprised of various psychotherapeutic modalities, with notable variations in duration, patient populations, and treatment settings. While books and publications have been written proposing methodologies to treat CSB from a theoretical perspective, only peer-reviewed publications have been included.

Cognitive Behavioral Therapy

One of the more common options that has been used and reported for CSB is cognitive-behavioral therapy (CBT), both as a comprehensive treatment and as isolated techniques within a larger methodology. Several open studies and case reports have shown CBT to be beneficial for CSB, although methodologies have varied.

Several cases have successfully combined standard CBT techniques with motivational interviewing and were associated with significant reductions in sexual behaviors such as frequency of sexual partners and amount of time spent online during work hours. One case report

suggested successful improvements after six treatments, with benefits persisting at post-treatment follow-up [50]. In another open study using CBT and motivational interviewing in a group setting for individuals with internet-based CSB, researchers found that patients reported improvements in quality of life and in depressive symptoms [51]. This study did not, however, show a significant decrease in the amount of inappropriate computer use, unlike the case reported by Shepherd [50]. Some additional evidence is available which could support the use of motivational interviewing with CSB, as a preliminary case series suggested that motivational interviewing was helpful in reducing symptoms of CSB [52].

Another open study assessed the efficacy of group CBT across 12 sessions [53]. All 12 participants were male, of whom 10 completed all 12 sessions. The analysis showed that subjects who completed all 12 study visits reported decreases in overall depression, anxiety, and sexual compulsive behaviors as assessed by standardized measures.

A notable alternative to traditional therapy is online self-directed therapy, a far newer field than either CBT or acceptance and commitment therapy (ACT), but may be a useful tool for certain cases of CSB. Only one study on this type of intervention has been conducted and was restricted to "The Candeo Online Recovery Program for Problematic Pornography Use" [54]. The Candeo program was designed based primarily on CBT principles and aims to characterize CSB as both an addiction and compulsive dysfunction. The program consists of a series of ten modules that the individual can work through, completing assignments individually and at his/her own pace. In the initial analysis, completion of the Candeo program was associated with decreases in obsessive thoughts, sexual behaviors, and other clinical factors, suggesting that the program was a successful way to deliver CBT, particularly for individuals who had not found previous therapy options to be helpful.

Acceptance and Commitment Therapy

Another form of therapy that has received some initial support is ACT, with one open study and one controlled study available to date conducted by Twohig and Crosby [55, 56••]. In both the open and controlled study, the course of therapy was associated with substantial improvements which were maintained when reassessed at a long-term follow-up visit. ACT may be a particularly notable treatment option, as it is one of the only randomized studies assessing treatment of CSB, and the only randomized study assessing a psychotherapeutic intervention. Thus, ACT appears to have initially promising support, but will require further validation to confirm initial findings.

Marital/Relationship Therapy

Marital/relationship therapy has been used successfully in several case series and case reports, although no studies to date have assessed its efficacy in treating CSB using a randomized protocol. In one initial case report, the researcher found that participation in marital sex therapy elicited notable improvements over the course of 1 year and twenty sessions [57]. This case does not, however, include standardized measures of improvement, instead focusing on the overall model of marital therapy used for the particular case. A later study expanded this analysis to a case series of six couples seen by four different therapists [58]. Analysis of outcomes suggested that the marital therapy was beneficial across several domains of cognitive processing and nature of the relationship, both for the patient struggling with CSB and the spouse. Improvements seen across cases suggest that marital therapy involving both partners can be beneficial, particularly when the problems with CSB have placed notable strain on both the patients and his/her spouse. These possibilities will, however, require additional assessment.

Eye Movement Desensitization and Reprocessing

One newer option is eye movement desensitization and reprocessing (EMDR), which is often included as an added feature of therapy, rather than a stand-alone treatment. Evidence for its use is limited to a single case report, however [59]. For the case report, therapy included features of both CBT and EMDR and followed an eight-phase treatment progression. The report also noted that the patient in the case is still in the process of treatment, thus conclusions are highly limited. Complete details of the EMDR technique use can be found in the original case report.

Multimodal Approaches

Additional general assessments of multimodal and general therapy have been described by other case reports, retrospective analyses, and long-term follow-up analyses. In general, these analyses have found several techniques, modalities, and contexts to be effective, but details on the specific methodologies are limited [60–63]. These studies and reports offer additional support for the use of therapy when treating CSB. For specific characteristics of these studies, please refer to the original publications, as particulars of the therapy techniques varied widely, and in some details only provided general treatment outlines.

Sex Addicts Anonymous (and Related)

Another potential treatment option for CSB is Sex Addicts Anonymous (SAA) and related groups. These groups promote

a 12-step philosophy for the treatment of CSB, mirroring many of the techniques used to treat other addictive disorders. No studies to date have assessed the efficacy and utility of these groups and programs. Additional research will be necessary to determine whether these programs offer significant benefit in helping patients reduce symptoms of CSB or maintain the improvements garnered form other forms of treatment.

Conclusions on Therapy Techniques for CSB

Data on therapy techniques designed for CSB remain extremely limited, with only one randomized study available to date, and many techniques supported by limited case reports and theoretical models. Despite these limitations, CBT, ACT, and marital therapy have shown early indications of utility in ameliorating the negative effects of CSB. CBT in particular may merit further investigation, as it is one of the foremost techniques in treating several potentially related disorders, such as behavioral addictions (including gambling disorder) as well as OCD [64, 65].

Case Example Treatment Suggestions

Based on the evidence presented in the previous sections relating to pharmacological and therapeutic techniques for treating CSB, potential treatment recommendations for the two initial vignettes are included below.

Case Example #1 Treatment Suggestions

Based on the treatment literature presented above, we can now discuss options for the two cases we initially presented. For Paul, the 42-year-old married man who struggled with compulsive masturbation, a combination of medications and therapy may be ideal. In order to help Paul manage his mood and potentially his CSB symptoms, an SSRI such as citalopram or sertraline may be particularly beneficial. In addition to potential benefits for reducing masturbation and time spent watching pornography, the SSRI may also help Paul's ongoing problems with depression. Additionally, Paul may benefit from two forms of therapy concurrently, including group therapy to address feelings of immorality regarding masturbation, and also marital therapy with his wife. The combination of both group therapy and marital therapy could be particularly beneficial, as one of Paul's largest concerns was how his wife would react to his behavior. This combined approach offers several benefits in addition to management of CSB symptoms including mood regulation, stigma reduction, and marital conflict mediation. Through a tailored treatment approach, it may be possible to increase Paul's ability to manage his compulsive masturbation and preserve the integrity of both his career and family.

Case Example #2 Treatment Suggestions

In the second case involving Reggie, the young gay man who had been engaging in high-risk sexual behavior with an increasing number of partners, the treatment options may differ from those used to treat Paul. In order to help Reggie manage his sexual compulsions, naltrexone may be an ideal option, as evidence to date suggests that it is particularly useful in mediating urges related to CSB, which is one of the most distressing aspects of CSB for Reggie. Additionally, individual therapy focusing on cognitive-behavioral techniques may be particularly beneficial, as this approach may challenge Reggie to assess his pattern of behavior and associated cognitions, emphasizing skills that will be helpful in managing his urges to seek out sexual partners. Finally, an important part of treatment for Reggie should include time spent discussing harm and risk reduction techniques if he does decide to have sex with a different partner. This is often a crucial aspect of treatment, as working with the patient to reduce risk when engaging in sexual acts can help to reduce the likelihood of contracting sexually transmitted infections, such as gonorrhea, syphilis, genital warts, and HIV. One of the most important aspects of this example is not just what specific treatment options to use, but also to emphasize the importance of asking patients about sexual behaviors and histories. Had Reggie's primary care doctor not asked him about his recent sexual partners and use of protection during sex, it is possible that Reggie's problems with compulsive cruising would not have come up during the appointment, even if Reggie was hoping that he would be offered an opportunity to talk to his doctor about problems he was having related to CSB.

Conclusion

Despite the dearth of available controlled data on the treatment of CSB, certain pharmacological and therapeutic interventions have received some preliminary support. For pharmacological agents, naltrexone and certain SSRIs have shown the most consistent efficacy across different reports. Although evidence is largely confined to case reports, evidence is highly consistent with treatment findings obtained with other impulsive and addictive disorders. Regarding therapeutic options, CBT, ACT, and marital therapy have shown consistent utility in treating CSB, with one available randomized study supporting the use of ACT in particular. While current findings provide a useful starting point for treating CSB, they also highlight the need for more extensive controlled research on the treatment of CSB. As research on CSB progresses, it will be critical to emphasize the use of controlled and randomized methodologies in conjunction with clinical case reports when assessing the treatment of CSB.

Compliance with Ethical Standards

Conflict of Interest Eric W. Leppink declares no conflict of interest. Jon E. Grant reports grants from Brainsway, grants from Forest, grants from Roche, grants from Trichotillomania Learning Center, and grants from NIMH, outside of the submitted work.

Human and Animal Rights and Informed Consent All studies conducted with human or animal subjects by the authors and referenced in this manuscript were completed in accordance with the Declaration of Helsinki and with the approval of the Institutional Review Board of the relevant Institution.

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•• Of major importance

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