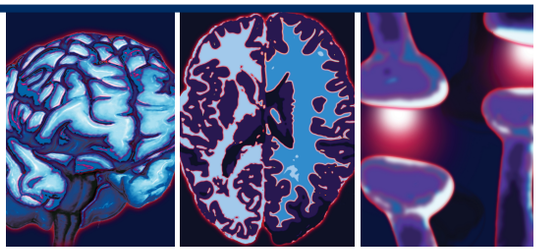

Perspectives on the assessment and treatment of adult ADHD in hypersexual men

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Practice points

- Adult patients seeking help for hypersexual behavior present with high prevalence rates of comorbid mood and anxiety disorders, ADHD and substance-related disorders.
- Many of the associated characteristics of ADHD, such as increased peer rejection, problems in romantic relationships and employment difficulties, may make individuals vulnerable to hypersexual behavior as a way of 'escaping' or 'avoiding' emotional discomfort.
- Clinicians should be aware of some of the unique characteristics of hypersexual patients in order to avoid misdiagnosing them with adult ADHD.
- Careful screening and diagnostic assessment for adult ADHD in hypersexual patients can differentiate legitimate cases of ADHD from symptoms that are associated with hypersexual behavior.
- Patients with hypersexual behavior and comorbid ADHD are likely to benefit from pharmacotherapy and behavioral therapy combined. Mindfulness interventions are also showing some preliminary evidence in producing positive outcomes in patients with adult ADHD and hypersexual behavior.

SUMMARY This article reviews the current body of research on adult ADHD and hypersexual behavior. Drawing on perspectives from the fields of psychology and neuroscience, several suggestions are offered to explain why individuals with ADHD may be vulnerable to engaging in hypersexual behavior. Assessment guidelines are provided to help clinicians differentiate characteristics of hypersexuality from adult ADHD. Finally, recommendations are made for the treatment of adult ADHD in hypersexual patients.

During the past decade an increasing number of clinicians and researchers have attempted to elucidate the associated characteristics of hypersexual behavior in an effort to provide greater understanding of this phenomenon [1–3]. Several studies have specifically focused on exploring psychopathology in hypersexual populations, including the presence of comorbid adult ADHD [4]. Although research suggests a high prevalence rate of adult ADHD among hypersexual men [5], many providers neglect to assess ADHD at the onset of treatment. Moreover, little has been written about why an individual with ADHD may be vulnerable to

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developing problems with hypersexual behavior. In order to assist clinicians in adopting a more evidence-based practice, this article summarizes the current body of knowledge related to adult ADHD in hypersexual men and describes how clinicians can assess and treat ADHD symptoms in their clinical work. We also offer some insight to help clinicians understand how a diathesis may exist for the onset of hypersexuality among individuals with ADHD.

Defining & assessing hypersexuality

Many of the variations labeling out of control, excessive sexual behavior (e.g., sex addiction, sexual compulsivity and sexual impulsivity) are captured by the DSM-5 proposal for hypersexual disorder (HD) [6]. HD is characterized as a pattern of repetitive and intense preoccupation with sexual fantasies, urges and behaviors lasting for a period of at least 6 months. Symptoms of HD are purported to be associated with unfavorable consequences, and clinically significant distress or impairment in social, occupational or other important areas of functioning [6–8]. Diminished levels of perceived control over sexual fantasies, urges and behaviors in response to dysphoric mood states or stressful life events are also part of the proposed diagnostic criteria for HD [6]. Although HD can occur comorbidly with paraphilic disorders, it is considered a separate and distinct phenomenon, and most manifestations are nonparaphilic. Moreover, symptoms cannot occur exclusively in the context of bipolar mania, be caused by a general medical condition, be substance induced, be the result of medication effects (e.g., Parkinson's medications causing hypersexuality) or be caused by some other neurological sequelae (e.g., traumatic brain injury, temporal lobe epilepsy and Klüver–Bucy syndrome). The majority of the studies on hypersexual behavior cited in this article incorporate several and, in many cases, most of these criteria.

Although there is no agreed upon standard for assessing hypersexual behavior, the proposed criteria for HD reflect the most current operationalization of hypersexuality. Many studies have been limited to assessing hypersexual behavior through self-report measures. Recently, however, our research team conducted a DSM-5 field trial for HD where both self-report scales and a structured diagnostic clinical interview were utilized in the evaluation of the proposed HD criteria [8]. Inter-rater reliability and validity of the criteria based on the rigorous methods employed in this field trial have established a new gold standard for assessing hypersexuality among researchers and we refer readers to the methods employed in our field trial for more information regarding assessment of HD [8].

Comorbid adult ADHD & hypersexuality

Early studies of psychopathology in hypersexual patients have identified a high prevalence of comorbid psychiatric conditions. For example, using diagnostic interviews in a sample of hypersexual subjects (n = 26), Kafka and Prentky found lifetime histories of mood disorders (80.8%), anxiety disorders (46.2%) and substance abuse (46.2%) most prevalent in their sample, with 84.6% of subjects meeting criteria for an axis I disorder [9]. Using structured diagnostic interviews in a sample of hypersexual subjects (n = 36), Black *et al.* found high lifetime histories of substance use disorders (64%), mood disorders (39%) and anxiety disorders (50%), with 83% of their sample meeting diagnostic criteria for an axis I disorder [10]. Raymond *et al.* also assessed a sample (n = 24) of hypersexual individuals using structured diagnostic interviews and found that patients met current criteria predominantly for mood disorders (33%), anxiety disorders (42%), substance-related disorders (29%), impulse-control disorders (25%) and sexual dysfunctions (25%) [11]. Although these studies made meaningful contributions to our understanding of psychiatric comorbidity associated with hypersexuality, they collectively overlooked the assessment and prevalence of adult ADHD. Similarly, research identifying comorbid psychopathology in hypersexual populations by self-report questionnaires (e.g., a depression scale) also neglected to include measures of ADHD. These omissions have limited our understanding about possible relationships between adult ADHD and hypersexual behavior [2,12–14].

Kafka and Prentky were among the first to explore comorbid ADHD in a sample of outpatient hypersexual males (n = 18) [4]. Using a combination of structured diagnostic interviews and self-report measures to retrospectively assess childhood symptoms of ADHD, 16.7% of their sample met diagnostic criteria for childhood onset of ADHD. Replicating these findings in a second sample of hypersexual men (n = 32), Kafka and Hennen found 18.7% of their sample met diagnostic criteria for childhood onset of

ADHD, with most patients meeting diagnostic criteria for inattentive symptoms of ADHD [15]. These two studies showed evidence of high prevalence rates of childhood ADHD in hypersexual men, but no information was obtained to assess whether these symptoms persisted into adulthood.

In an effort to find some estimate of the prevalence of adult ADHD symptoms in hypersexual patients, Blankenship and Laaser administered a self-report measure to assess the characteristics of ADHD in a treatment-seeking sample (n = 70) of men they categorized as sex addicts [16]. Results of their study indicated that 67% of their sample reported some level of classic ADHD, with the majority of men classified as the subtype predominantly inattentive. In a further analysis, they stated that 21% of their sample fell in the probable ADHD category, while 34% of their sample were highly probable of having an ADHD diagnosis. It is difficult, however, to discern what their findings meant regarding an actual adult ADHD diagnosis because a self-report measure (rather than a diagnostic interview) was utilized and the scale employed in their study had no reported published psychometric properties. Subsequently, some uncertainty exists regarding the validity of their reported results. Nevertheless, the study suggested that adult ADHD may be common among hypersexual patients and, consistent with Kafka and Hennen, it was noted that the majority of symptoms appeared to reflect inattentive patterns of ADHD [15].

The first study to report prevalence rates of adult ADHD using diagnostic interviews of both childhood and current adult symptoms of ADHD was a study investigating readiness to change among patients (n = 67) seeking help for hypersexual behavior [17]. The study used two raters (one with doctoral training in neuropsychology and the other a board-certified psychiatrist) who independently conducted diagnostic interviews and a retrospective interview of childhood ADHD symptoms for each patient. Furthermore, patients in the study completed the Conners' Adult ADHD Rating Scale [18], the Adult ADHD Self-Report Scale [19] and the Wender Utah Rating Scale [20], which were used to inform inquiries during the diagnostic interviews. The patients showed high comorbid mood disorders (59.7%) and anxiety disorders (20.8%), with 26.7% of the sample meeting diagnostic criteria for adult ADHD. Consistent with previous reports, the majority of those diagnosed with adult ADHD met criteria for the inattentive subtype. The study also reported that hypersexual patients with adult ADHD were significantly more likely to present at the onset of treatment with greater ambivalence about change compared with hypersexual patients without comorbid adult ADHD [17].

In an effort to further elucidate the characteristics of adult ADHD in hypersexual patients, Reid and colleagues conducted a second investigation following the procedures used in the aforementioned study [17] in a large consecutive treatment-seeking sample (n = 361) of hypersexual men [5]. Similar results were obtained with 23.3% of the sample being diagnosed with adult ADHD, with the vast majority meeting criteria for the inattentive subtype (96.4% of those diagnosed with adult ADHD were predominantly inattentive). Notably, this prevalence rate of adult ADHD is significantly higher than the 3–5% rate estimated in general adult populations [21]. Although it is outside the scope of the present article, it should be noted that psychological evaluations of hypersexual patients have not reported incident rates of learning disorders and other neuropsychological pathologies, such as traumatic brain injury or neurodegenerative diseases. Moreover, studies to date have not assessed the prevalence rate of hypersexual behavior in patients seeking help for a primary complaint of adult ADHD.

In summary, these studies suggest hypersexual patients are likely to present with high comorbid mood, anxiety and substance-related disorders. Research emerging in the past few years also highlights a high prevalence of co-occurring adult ADHD in hypersexual patients, with prominent features of the inattentive subtype manifesting. Subsequently, it is important that providers treating hypersexual populations recognize this high comorbidity rate and consider possible reasons why the symptoms of ADHD are so prevalent in patients seeking help for hypersexual behavior.

Understanding adult ADHD in hypersexual men

Intuitively, clinicians often assume that hyperactive or impulsive features of ADHD create a diathesis for the onset or maintenance of hypersexual behavior. Certainly some evidence supports this perspective given that studies have linked difficulties with self-regulation

to attentional control [22]. However, research among patients seeking help for hypersexual behavior has failed to support associations between these characteristics of ADHD and hypersexuality. Instead, features of low self-esteem and problems with self-concept, as measured by the Conners' Adult ADHD Rating Scale [18], appear to be most predictive of hypersexual behavior with impulsivity playing a rather small role [5]. The core features associated with problems of self-concept reflect a lack of self-confidence, being unsure of oneself or a belief that one has diminished abilities interfering with goal attainment. This finding is similar to other research among hypersexual patients without ADHD who exhibited greater levels of shame, low self-esteem and feelings of demoralization [23]. However, questions remain about why hypersexual patients with ADHD might be particularly vulnerable to deficits of self-concept, and how this may play a role in the onset or maintenance of hypersexual behavior.

Developmentally, a number of studies have documented challenges encountered disproportionally by children diagnosed with ADHD, including increased social rejection, loneliness, academic underachievement, emotional dysregulation and difficulties with task completion [24]. Many of these symptoms appear to persist into adulthood, creating a vulnerability to chronic loneliness, poor self-concept and diminished identity formation [25]. Furthermore, adults with ADHD are at increased risk of relationship difficulties, attrition from college and have poor work performance records, all of which can adversely affect self-concept [26,27]. Researchers studying hypersexual behavior believe the collective burden of these deficits creates a diathesis for the onset and maintenance of hypersexuality [5]. These perspectives assert that at some point, individuals who encounter such negative experiences seek to escape their emotional discomfort through a mood-altering experience (e.g., sex, gambling, drugs, alcohol and emotional eating). This is precisely the type of pattern observed in substance abusers with adult ADHD as Kalbag and Levin explain, "…persistent ADHD symptoms may lead to impairments in academic, occupational and interpersonal functioning [which] … in turn may cause low self-esteem and/or depression and a propensity to use alcohol or other drugs to cope with the deficits in functioning" [28]. Additional evidence for this perspective has been obtained by self-report among adult subjects diagnosed with ADHD and comorbid substance abuse who endorsed using drugs to 'self-medicate' their symptom distress [29]. Patients with ADHD may also experience executive deficits, boredom proneness and greater sensation-seeking tendencies that might also contribute to the development of hypersexuality. At present, further research is needed to confirm how symptoms of ADHD and associated features may exert a mediating or moderating influence on the levels of hypersexual behavior. In the interim, however, these perspectives are consistent with the anecdotal impressions of two of the authors (Reid and Fong) who have worked with hundreds of hypersexual patients over the past decade.

Insights from neuroscience

Alternative perspectives from the field of neuroscience and attention regulation have yet to be explored among hypersexual populations. Nevertheless, evolving neuroscience research may offer some hypothesis generating ideas to explain why individuals with ADHD may be particularly vulnerable to developing behaviors that involve sexual preoccupation (e.g., sustained vigilance of attention on sexually salient stimuli). For example, impairments in the function and anatomical integrity of the prefrontal cortex, a region involved in behavioral control [30,31], have been documented in individuals with ADHD [32–34]. The interactions of the prefrontal cortex with striatal and limbic regions are of particular note, as they have been directly linked to symptoms of impulsivity in individuals with ADHD [34–38]. The propensity for impulsive behavior that comes with deficits of the frontostriatal system could contribute, when combined with the salience of sexual stimuli, to maladaptive hypersexual behavior. However, since ADHD in hypersexual patients is more strongly associated with inattentive symptoms of ADHD than with impulsivity [15,16], perhaps the more important system is that which contributes to deficits of sustained attention in ADHD. These have been hypothesized to arise from hypoarousal [39–41], with catecholamine abnormality being one proposed account of symptomatic response variability and the inability to maintain a focused state for prolonged time intervals [42,43]. It is not implausible that hypoarousal could contribute to sensation-seeking behaviors, such

as those afforded by sexually salient stimuli. In this regard, hypersexual individuals with ADHD may lack the ability to sustain attention on a given target stimuli (e.g., reading an important work-related report for a meeting the following day) and fail to inhibit attention on a distractor stimuli (e.g., viewing pornography and thoughts about having sex), which interferes with task completion necessary for goal attainment (e.g., being prepared for the work meeting) as depicted in **Figure 1**. In such a condition, an attention bias is oriented toward the salience or signal strength of a potential target or distractor. While these hypotheses warrant further testing, the known characteristics of ADHD provide feasible precursor conditions for hypersexuality.

Assessing adult ADHD in hypersexual men

Diagnosis of ADHD in adults continues to be a controversial topic in the literature [44]. For example, some have suggested that current DSM-IV criteria for ADHD has emerged from studies with children [45] and lacks developmental sensitivity with adult populations [46]. Although it is estimated that approximately 70% of those meeting childhood criteria for ADHD will continue to exhibit symptoms in adulthood [47–49], research demonstrates that adults outgrow some of the childhood symptoms (particularly those associated with hyperactivity/impulsivity), which makes the diagnostic threshold too restrictive [50–54]. It has also been observed that common complaints among adults with ADHD, such as chronic procrastination, low tolerance for frustration, problems with motivation, insomnia and difficulties managing time, are not part of the current diagnostic criteria in the DSM-IV [55]. Hyperactive symptoms also appear to diminish with age and in adulthood hyperactivity is manifested as an internal restlessness [56]. Moreover, differential and comorbid diagnosis is also of concern given the complexity of co-occurring axis I psychiatric disorders often found in patients with ADHD, including mood, anxiety and substance-related disorders [57]. As children grow into adults, they also develop more sophisticated compensatory strategies that may shield them from negative consequences associated with ADHD symptoms and, subsequently, reduce the likelihood of a diagnosis (or rather endorsement of ADHD symptoms). For

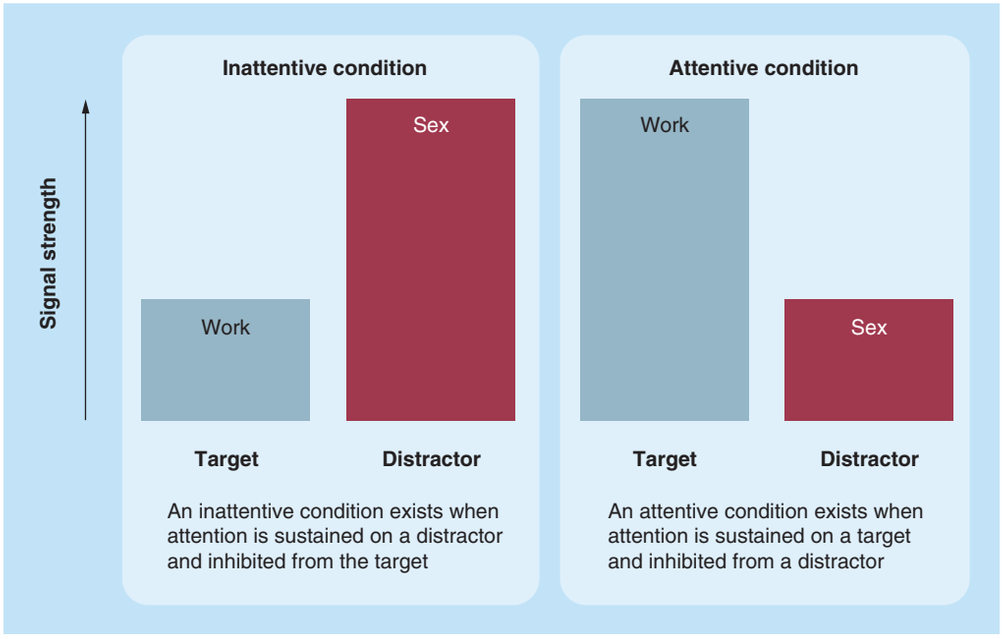

Figure 1. Attention model of hypersexuality. Individuals with attentional deficits and hypersexual behavior may be unable to sustain attention on a target (e.g., reading an important work-related report for a meeting the following day) because the salience of the signal strength for the distractor (e.g., sex) captures the focus of their attention, creating an inattentive condition for the target. In an attentive condition, individuals are able to focus their attention on a target and inhibit their attention from a distractor experience, allowing for greater task completion and goal attainment.

example, patients may deny work interference but upon further inquiry they may concede if a supervisor observed an average day of their work productivity their employment status might be at risk. Researchers also note that sophisticated coping strategies can create domain-specific success but challenges in other areas of psychosocial functioning [58]. Despite these varied concerns associated with diagnosing ADHD in adults, careful inquiries combined with psychological testing and collateral information can help clinicians in the assessment process.

Assessing ADHD in hypersexual patients does not vary significantly from assessments conducted for ADHD in non-hypersexual patients. However, hypersexual patients (who do not meet the criteria for ADHD) may respond to clinical inquiries in ways that appear to reflect some ADHD symptoms. For example, hypersexual patients frequently report difficulties keeping focused on work or other aspects of life but it is generally because they are preoccupied with sexual thoughts. Sometimes difficulties paying attention in interpersonal conversations arises because hypersexual patients may objectify and begin to fantasize about people with whom they interact. A common pattern among many hypersexual patients involves procrastinating work and other important tasks in order to pursue sexual opportunities. Thus, hypersexual patients have difficulties following through on commitments, task completion and goal attainment. However, unlike patients with ADHD, hypersexual patients will report histories free of such interferences at times in their life when they were not preoccupied with sex, including childhood developmental years.

Another common complaint among hypersexual patients includes feelings of restlessness, which, in turn, often triggers sexual behavior. Again, this restlessness appears to be more related to anticipatory excitation about opportunities for sexual pleasure than the restlessness that is common in adults with ADHD. Some hypersexual patients may have difficulty focusing or concentrating but it may be due to sleep deprivation from staying up during the night while pursuing sexual opportunities online versus the sustained attention difficulties reported by patients with ADHD. Finally, although impulsive behavior, including sexual risk taking, is common among hypersexual patients, not all hypersexual patients exhibit generalized impulsivity [2] outside of a sexual context. For example, in some studies, less than 10% of hypersexual patients met criteria for a current substance abuse disorder [17] and, in other unpublished work from our laboratory, we have found that less than 19% of hypersexual patients meet criteria for pathological gambling and fewer than 2% meet criteria for an eating disorder. These data suggest that hypersexual patients tend to exhibit self-control in their alcohol and food consumption, money management and possibly other areas of their life, however, lack impulse control as it relates to sexually salient stimuli. Patients with ADHD, however, are more likely to exhibit impulsive behavior across multiple domains in their lives.

In summary, questions and responses related to ADHD symptoms should always be considered in the context of hypersexual behavior and whether manifestations of ADHD symptoms are related to ADHD or the associated features of hypersexuality. With the exception of some caveats as noted above, assessing ADHD among hypersexual patients follows many of the protocols noted by experts in the field of adult ADHD [59–63]. For example, it is helpful to begin gathering information with several self-report measures, including instruments that assess mood disorders, anxiety disorders and substance-related disorders. In screening for adult ADHD, instruments, such as the 18-item Adult ADHD Self-Report Scale, containing items related to inattentive and hyperactive/impulsive symptoms of ADHD can be helpful [19]. Positive screens receive additional testing to retrospectively assess for childhood symptoms of ADHD. The Wender Utah Rating Scale for assessing retrospective symptoms of ADHD in childhood is widely used in research but probably less helpful in clinical work [20]. A self-report measure with good psychometric properties is the Conners' Adult ADHD Rating Scale [18], which assesses ADHD symptoms commonly reported by adults. Results from these self-report instruments can then be used to guide diagnostic clinical interviews that include retrospective assessment for childhood symptoms of ADHD and current criteria for adult ADHD. If results of the retrospective childhood interview contraindicate a childhood diagnosis of ADHD, testing is generally discontinued unless there is evidence that the patient is unable to reliably report childhood symptoms.

A number of child and adult ADHD-structured interviews exist, including the adapted module from the Schedule for Affective Disorders and Schizophrenia for School Aged

Children–Present and Lifetime Version [64,65] and the adult ADHD module of the Mini International Neuropsychiatric Interview [66], which many providers find helpful in both research and clinical settings. A number of the items noted in **Box 1** also appear to be endorsed more significantly among adults diagnosed with ADHD compared with healthy controls and might be helpful to guide clinicians in their diagnostic interviews. In more complex cases where an alternative or comorbid diagnosis is being considered, indices of cognitive ability, working memory and executive functioning should be assessed through neuropsychological testing. Specifically, subtests from the Wechsler Adult Intelligence Scale–Fourth Edition [67] should be considered, including vocabulary, similarities, arithmetic and letter-number sequencing, which allow comparisons between verbal comprehension and working memory indices. This approach is based on research identifying deficits in working memory among patients with ADHD [68–70]. Aspects of executive functioning may also be assessed using neuropsychological tests such as subtests from the Delis–Kaplan Executive Function System [71].

Box 1. Characteristics and symptoms frequently endorsed by adults diagnosed with ADHD.

Inattentive characteristics

- Failure to give close attention to detail or making careless mistakes
- Difficulty sustaining attention in tasks/activities, especially when the task is mundane, routine or boring
- Difficulty processing language, such as omitting details when listening to others and misinterpreting others
- Failure to follow through on instructions/difficulties completing tasks
- Difficulty organizing tasks and activities, may feel easily flooded or overwhelmed with too much information
- Habitual pattern of procrastination, especially when task is mundane, routine or boring
- Difficulty prioritizing tasks and getting the most important things done
- Often avoids, dislikes or is reluctant to engage in tasks that require sustained mental effort (e.g., vigilance)
- Misplacing things of importance (car keys, cell phone, day planner and documents)
- Easily distracted by extraneous stimuli, particularly salient stimuli
- Answering a different question than asked due to neglecting the detail of the original questions
- Difficulty remembering things in daily routines and activities
- Difficulty managing time, late for appointments and underestimating the time it takes to accomplish a task
- Unprepared (incomplete work assignments and college homework)
- Engaging in tangent activities while sacrificing essential tasks
- Hyperfocusing on some tasks (e.g., video games, and some aspects of work or school)
- Sequential memory (e.g., forgetting a short list of grocery items)

Hyperactive/impulsive characteristics

- Feeling 'on the go' or 'internal restlessness' (e.g., managing several things all at once)
- Talks excessively or has difficulty being concise about things
- Interrupts or intrudes on others (e.g., interrupts conversations or intrudes into other people's personal information)
- Verbally repeating self (says the same thing a few different ways during conversation)
- Blurts out comments (sometimes socially inappropriate)
- Impatient (e.g., difficulty awaiting turn where waiting is required)
- Impulsive sexual behavior (possibly risky sex)
- Problems with impulsive spending and difficulty managing money
- Reckless or impatient driving, automobile accidents and speeding tickets
- Mind jumping from thought to thought with numerous ideas throughout the day
- Easily frustrated, irritable, temper outbursts and low tolerance for frustration
- Feeling restless, antsy or fidgety

Items taken from the University of California, Los Angeles Adult ADHD Symptoms Scale.

The Delis–Kaplan Executive Function System includes subtests, such as the color–word interference test, the tower test, verbal fluency test and the trail-making test, which tap into cognitive flexibility, set shifting, divided and sustained attention, problem solving, vigilance, planning and response inhibition. It is also worth noting that, although hypersexual patients exhibit a number of characteristics associated with executive deficits, they perform within normal limits on neuropsychological tests of executive functioning [72].

The results from these tests combined with clinical judgment based on DSM diagnostic criteria for ADHD are used to make a final determination about diagnostic classification. In some cases, collateral data from a partner, close friend or others familiar with the patient can provide additional insights. Differential or comorbid diagnosis should be considered, including bipolar disorder, dysthymic disorder, learning disabilities and substance-related disorders. Finally, a thorough medical and neuropsychiatric history should be conducted to eliminate alternative explanations for ADHD and hypersexual behavior, including the possibility of any of the following: hyperthyroidism or hypothyroidism; neurotoxin exposures; stroke; vascular disorders; infections (e.g., encephalitis); diabetes; serotonin producing cancers; heart or lung diseases that produce low oxygen levels; sleep apnea; narcolepsy; kidney problems that disrupt sodium or potassium levels; seizures; blackouts; Cushing's disease that induces hypercortisol production; multiple sclerosis; and hypoglycemia.

Treating adult ADHD in hypersexual men

Owing to the severity and persistence of symptoms, no single treatment intervention has been identified as being the most successful in treating adult ADHD [26]. Difficulties ascertaining valid treatment strategies have also occurred given the lack of treatment guidelines for adult ADHD. Despite these limitations, several strategies have demonstrated positive results in symptom reduction and overall improvement in quality of life among adult ADHD populations [55].

■ Pharmacotherapy approaches

The most commonly used treatment for individuals with ADHD has been pharmacotherapy [73], including stimulants (e.g., methylphenidate and amphetamine), antidepressants (e.g., desipramine and atomoxetine) and antihypertensive agents (e.g., clonidine and guanfacine), although their effectiveness in adult populations has yielded mixed results and is less established than those noted in child studies [74]. For example, while some stimulant studies have demonstrated response rates as high as 78% in adult ADHD populations [75,76], others have indicated that 20–50% of individuals are unresponsive or intolerant of stimulants [77,78]. Furthermore, some studies report that antidepressants and antihypertensive agents have been shown to reduce core ADHD symptoms in only 50% of responders [79–81], leading to inconclusive perspectives about their efficacy.

Pharmacological interventions for those with ADHD and co-occurring hypersexuality are theoretically aimed at reducing impulsivity, improving self-control and reducing distractibility. Patients with ADHD are drawn to intense, rewarding, multisensory stimuli such as video games, television and online content. Clinically, the premise is that medications for ADHD and hypersexual behavior would allow patients to attend to less rewarding stimuli and focus on other daily tasks. Moreover, medications can attenuate the restlessness that is often a trigger for hypersexual behavior. Medications can also help patients attend to the therapeutic process, sit in a recovery group and complete therapy assignments. It remains to be studied how ADHD medications will impact symptom domains of hypersexual behaviors but it is plausible there will be benefits given overlapping symptoms between the two disorders. Most notably, a beneficial treatment response to ADHD medications will provide significant relief in the areas of attention, self-control, focus, mindfulness, self-regulation, organization and listening, which may, in turn, mediate the symptoms of hypersexual behavior. Treatment response times will vary considerably between patients and there are no empirical data to examine this relationship for hypersexual behaviors.

Clinical experience with hypersexual patients with comorbid ADHD suggests that treatment response times vary greatly but most patients will find relief from ADHD symptoms within the first week and will subsequently see a reduction in hypersexual behaviors. Selection of a medication as the first-line treatment agent tends to follow treatment guidelines for prescribing for a patient who has ADHD alone. There does not appear to be one medication

that exacerbates hypersexual behaviors or significantly attenuates the symptoms more than others. Typically, clinicians are encouraged to use a long-acting, nonabusable stimulant, such as Concerta® (Janssen Pharmaceuticals Inc., NJ, USA) or Vyvanse® (Shire US Inc., PA, USA). Extended release formulations of Adderall® (Shire Richwood Inc., Dublin, Ireland) or Dexedrine® (Amedra Pharmaceuticals, NJ, USA) are also appropriate but do carry higher potential for abuse because of the tablet formulation and reports of abuse in the field. Immediate, short-acting stimulants are best avoided in this population given the propensity for addiction to other substances of abuse and the immediate, intense reinforcing effects of stimulants. Prior to initiating a stimulant, providers should have a thorough understanding of the patient's level of sexual functioning and performance in order to be able to make comparisons once treatment starts. Caution should be taken to ensure accurate diagnosis as administering medications for misdiagnosed bipolar to patients who have ADHD can increase symptom severity causing unintended harm or negative consequences.

While these medications may provide symptom relief or reduction, it is noted that co-occurring conditions with ADHD, particularly mood disorders, may often counteract or interfere with response to medications, particularly stimulants [59]. As a result, additional support is often necessary in order to improve the daily functioning of adults with ADHD [82]. For example, studies investigating the use of cognitive–behavioral therapy in adult ADHD populations have demonstrated a positive outcome in reducing functional problems (e.g., procrastination and poor time management), as well as improving symptoms related to comorbid conditions such as anxiety or depression [83]. Furthermore, skills training, psychoeducation and individual psychotherapy have been shown to help adults with ADHD incorporate skills, such as problem solving, planning and time management, into their daily lives [84,85]. While these interventions have demonstrated utility in treating adult ADHD, there is evidence they are most effective when used in conjunction with medications [83]. Moreover, empirical support for such findings is insufficient, and additional controlled investigations using strong methodological designs are needed [55] and this appears to be especially true in the field of treatment for hypersexual behavior [86].

■ Adverse effects

One obvious, unique concern with ADHD medications would be the possibility of enhancing sexual drive in patients with hypersexual behaviors. Stimulants are used to treat sexual dysfunction and diversion of these medications along with simple compliance with them may impact sexual drive and performance. Empirically, it has not been demonstrated whether an increase in libido as caused by pharmacological enhancement, will adversely affect the clinical course of hypersexual behavior. Clinicians are advised to monitor this during the course of treatment, especially as it relates to sexual behavior.

■ Nonpharmacological treatments for ADHD

Practice guidelines on the treatment of adult ADHD all recommend multimodal interventions, given that a significant number of patients do not tolerate, respond to or fail to reach optimal outcomes with medication alone [87]. Cognitive–behavioral therapy focusing on restructuring irrational cognitions and maladaptive behaviors appears to show some efficacy in reducing ADHD symptoms [88] and hypersexual behavior [89]. The cognitive–behavioral therapy model provides structure, psychoeducation, active involvement of the clinician and requisite coping strategies for managing ADHD symptoms, while also offering interpersonal support as compared with other psychotherapy approaches [90]. Dialectical behavioral approaches have also been employed [85] with therapy modules containing material on the neurobiology of ADHD, mindfulness meditation, facets of chaos and control, impulse control, behavior analysis, affect regulation, depression, medication in ADHD, stress management, dependency, insights related to the effects of ADHD on interpersonal relationships and enhancing self-respect.

Neurofeedback is an alternative nonpharmacological intervention implicated in recent studies of ADHD treatment. This novel practice is an EEG biofeedback method targeting brain-wave modifications to atypical EEG patterns through real-time feedback. Based on the perspective that ADHD is characterized by excessive hyperarousal across frontal cortical regions in the brain [91], this ability teaches individuals with ADHD to alter their brain states from an 'abnormal' hyperactive pattern to one resembling that of normal, attentive healthy controls. For example, experimental

studies employing this method have indicated a reduction in ADHD symptoms of inattention, impulsivity and hyperactivity in children with ADHD [92,93] after receiving training on how to activate and decrease theta/beta ratios found to be elevated among individuals with ADHD [94]. While comparisons between neurofeedback and stimulant treatment of ADHD have yielded favorable results supporting the efficaciousness of neurofeedback interventions [95], researchers have pointed out the lack of well-controlled randomized studies, small sample sizes and evidence for long-term outcomes in the current literature examining this approach [96].

Another promising treatment includes mindfulness-based interventions, which have shown some positive results in individuals with ADHD [97,98]. Mindfulness interventions also appear to be helpful in disorders where behavior regulation is compromised [98–100]. Moreover, mindfulness seems to attenuate problematic characteristics that often are implicated in various psychiatric disorders, including those involving deficits in self-control [101], impulsivity [102,103] and emotional dysregulation [104–106]. Since impulsive behavior, emotional dysregulation and stress susceptibility are also common in patients seeking help for hypersexual behavior [6,107,108], mindfulness approaches may have potential to benefit patients with comorbid ADHD and hypersexuality.

Treatment of hypersexual behavior

A number of self-help materials and workbooks containing anecdotal suggestions for change have been published to assist patients seeking help for hypersexual behavior. However, there is a paucity of rigorous outcome studies assessing the efficacy or effectiveness of treatment interventions in this population [1,86,109,110]. Case studies and nonrandomized open clinical trials have reported successful treatment of hypersexual patients with pharmacotherapeutic interventions, such as selective serotonin reuptake inhibitors [111] or opiate agonists, such as naltrexone [112,113]. However, a recent examination of the current literature on pharmacological treatments found a number of significant methodological limitations to these studies [114].

Non-medication strategies also assert a vast array of interventions, including cognitive–behavioral therapy [89,115,116], gestalt therapy [117], acceptance and commitment therapy [118], 12-step programs [119] and couples therapy [120]. However, when these studies are subjected to rigorous standards often required by the scientific community, we again find significant limitations that question the validity of their respective results [86].

Conclusion

As clinicians work with patients seeking help for hypersexual behavior, it is helpful to know that these patients present with high prevalence rates of comorbid mood and anxiety disorders, ADHD, and substance-related disorders. Many of the associated characteristics of ADHD, such as increased peer rejection, problems in romantic relationships, impulsivity and employment difficulties, may make individuals vulnerable to engaging in hypersexual behavior as a way of escaping or avoiding emotional discomfort. Clinicians should be aware of some unique characteristics of hypersexual patients in order to avoid misdiagnosing them with adult ADHD. Careful screening and diagnostic assessment for adult ADHD in hypersexual patients can differentiate legitimate cases of ADHD from symptoms that are associated with hypersexual behavior. In orchestrating treatment planning with hypersexual patients with comorbid ADHD, combined pharmacotherapy and behavioral therapy should be considered. Some emerging work in the fields of mindfulness interventions and neurofeedback are also showing some preliminary evidence in producing positive outcomes in patients with adult ADHD and hypersexual behavior. Future research might be considered if there are additional clinical considerations for this subset of hypersexual patients and outcome studies might help highlight the best practices for working with this population. Given the growing body of research on hypersexual behavior, this phenomenon will continue to be of interest over the next several years as clinicians and researchers seek to understand the etiology, associated characteristics and the best practices for treatment.

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