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Fabian M. Saleh,[1,2] *M.D.; Tracey Niel,*[3] *M.A.; and Marc J. Fishman,*[2,4] *M.D.*

Treatment of Paraphilia in Young Adults with Leuprolide Acetate: A Preliminary Case Report Series

ABSTRACT: Some juveniles who engage in sexual offenses may have a paraphilia, a psychiatric disorder characterized by a pervasive pattern of deviant and impairing sexual fantasies, thoughts, and/or behaviors. Though there is no known cure for these conditions, paraphilias can be effectively managed using a multimodal treatment approach. This may include the use of psychotherapeutic and pharmacological treatment interventions, including antiandrogen medications. One such agent, leuprolide acetate (leuprolide), a luteinizing hormone-releasing-hormone agonist, has been shown to be effective in reducing paraphilic symptoms in adult patients. To date, however, there is no published data on its use and effectiveness in adolescent and young adult paraphilic patients. This study consists of a case report series of six young adult patients treated with leuprolide. All subjects had been diagnosed with at least one paraphilia (i.e., Pedophilia, Sexual Sadism, Frotteurism, and Paraphilia Not Otherwise Specified). All subjects had been refractory to treatment in a residential program for adolescent sex offenders prior to initiation of leuprolide. All six subjects reported a reduction in sexually deviant symptoms following treatment with leuprolide. Clinicians rated four as much improved and two as moderately improved. The treatment was well tolerated in all six subjects. This preliminary case series supports the conclusion that leuprolide deserves further examination as a potentially safe and effective component in the treatment of young adult patients with paraphilia.

KEYWORDS: forensic science, paraphilia, co-morbidity, psychopharmacological treatment

Paraphilias, or sexual deviation syndromes, are psychiatric disorders characterized by deviant and impairing sexual fantasies, thoughts and/or behaviors (1). These chronic and often debilitating conditions are conspicuously more prevalent in males than in females. Afflicted individuals typically become aware of the unconventionality of their sexual thoughts and preferences around the time of puberty (2,3). Regardless of "will power" or knowledge of legal or moral implications, individuals with a paraphilia may succumb to their deviant sexual urges and cravings. Though the natural course of the syndrome varies from individual to individual, the age at which sexually deviant fantasies are first experienced usually precedes the actual sexually offending behavior by several years (4–7). Only a small number of individuals seeks treatment voluntarily at this phase of their disorder. Most enter treatment at a stage when victimization and breach of societal norms has already taken place.

Despite the fact that there is no known cure for paraphilic disorders, these conditions can be treated effectively with a variety of psychotherapeutic and pharmacological interventions. It is hoped that early therapeutic interventions may preempt and forestall the establishment of a self-sustaining and reinforcing aberrant sexual behavioral cycle (8,9).

Pharmacotherapy as a component of a broad treatment approach has proven valuable in the management of some paraphilic patients. Antiandrogens comprise one major class of medications used to treat paraphilias. Medroxyprogesterone acetate (MPA), a potent synthetic progestational agent, has been used as a sexual drive suppressant with some success since the late 1950s (4,10,11). Because of its potential side effects, newer testosterone lowering agents, such as leuprolide acetate, have been studied and are considered by some to be viable alternatives to MPA (12,13).

Leuprolide, a luteinizing hormone-releasing-hormone agonist (LHRH-A), is a testosterone-lowering agent that has been studied in patients with central precocious puberty, prostate cancer, and endometriosis (14,15). Since the early 1990s, leuprolide has been used in the treatment of patients with paraphilia. Leuprolide has gained growing acceptance in part because of its preferable side effect profile compared to MPA. Moreover, leuprolide appears to be effective in some patients who have failed to respond to MPA or other agents such as cyproterone (16–18). Leuprolide's commonly employed active phase dose is 7.5 mg per month, and because of its lack of oral bioavailability, it is injected into an area of large muscle. Long-term treatment with leuprolide eventually causes a net decrease in testosterone and dihydrotestosterone. However, the first two to four weeks of treatment are marked by an increase in testicular steroidogenesis and hence, sex hormone production (19). The first segment of leuprolide's biphasic effect on the hypothalamic-pituitary-gonadal axis can be antagonized by the concurrent administration of the nonhormonal antiandrogen flutamide. Flutamide at 750 mg per day is usually prescribed for the first two to four weeks of treatment with leuprolide (17,18, 20).

While there is an emerging body of work supporting the use of leuprolide in the treatment of adult paraphilic patients, there is a dearth of published research on its use in late adolescent or young adult patients. This paper examines the cases of six young paraphilic patients who tolerated and responded well to leuprolide.

[1] University of Massachusetts Medical School, Department of Psychiatry, Worcester, MA.
[2] Johns Hopkins University School of Medicine, Baltimore, MD.
[3] Family Advocacy Services, Baltimore, MD. New Directions Program, Chesapeake Treatment Centers, Baltimore, MD.
[4] New Directions Program, Chesapeake Treatment Centers, Baltimore, MD.

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Methods

At the time of the treatment application reported in this case series, all subjects were patients at a long-term, secure Residential Treatment Center (RTC), the New Directions program operated by Chesapeake Treatment Centers, Incorporated in Baltimore, Maryland. This program specializes in the treatment of male adolescents who have been adjudicated by the Maryland Department of Juvenile Justice for aggressive sexual offenses. All of the program residents have been refractory to treatment in other settings, including other RTCs. All residents receive intensive sex offender treatment in the form of individual and group psychotherapy and, when indicated, pharmacological treatment for co-morbid psychiatric disorders. Residents also participate in expressive therapy in the form of music and recreational therapy. Psycho-educational groups and community integration training are also included in treatment. The facility provides 24-hour nursing services and has an on-site educational academy. The residents range in age from 15–21 years of age. The average stay for residents is 18–24 months.

As part of the routine course of clinical care, residents whose evaluations and longitudinal presentations suggested an indication for pharmacological treatment of a paraphilia were considered for a trial with leuprolide. Over a 16-month period, from September 2001–December 2002, seven subjects were prescribed leuprolide. Six of these subjects remained in treatment at the center after initiation of leuprolide for at least ten months and are included in this case series. The seventh patent was excluded because he was discharged from the center after only one month on leuprolide, without adequate observation of response. All subjects were of the age of consent when informed consent for treatment was obtained. All underwent a comprehensive psychiatric and medical evaluation, including a laboratory work-up (i.e., complete blood count, comprehensive metabolic panel, thyroid-stimulating-hormone, free and total serum testosterone, estradiol, serum follicle-stimulating hormone, and serum luteinizing hormone). Because treatment with leuprolide can cause a decrease in bone density, all subjects underwent Dual Energy X-ray Absorptiometry (DEXA) of their lower spine and long bones prior to treatment with leuprolide.

Following successful pretreatment work-up, eligible subjects were treated with leuprolide (7.5 mg/month) and flutamide (250 mg p.o. TID for the first 14 days of treatment with leuprolide). Clinical response was rated subjectively by the treating physicians.

Clinical case vignettes were abstracted by retrospective chart review. Data abstraction was performed using research case label identifiers so that identification of individual patients would no longer be possible. The study was approved by the Johns Hopkins University School of Medicine Institutional Review Board (the Joint Committee on Clinical Investigation).

Results

In the following case vignettes, the letter S denominates subject, and the letters A–F identify the individual.

Subject A

Subject A (S.A.) was a 20-year-old Caucasian male diagnosed with Pedophilia, Frotteurism, Bipolar Disorder, Conduct Disorder, Alcohol Abuse, and Borderline Intellectual Functioning. As a child, he was neglected and the victim of severe physical and sexual abuse. He was enrolled in special education programs throughout his formative years. S.A. was diagnosed with Attention-Deficit/Hyperactivity-Disorder (ADHD) as a child and was once psychiatrically hospitalized following a suicide attempt at age 14. He had no reported history of vocational training or work experience. In early adolescence he began abusing alcohol habitually. Medication trials included treatments with mood stabilizing and antipsychotic agents.

S.A.'s sexual history is noteworthy for violent sexual thoughts and fantasies as early as age 5. S.A. reported becoming sexually active with females both younger and older than he at age 7. In his early teens, he engaged in voyeuristic behaviors and began grooming prepubescent children for sex. He had forced sex with both male and female children under the age of 11 including sodomy, cunnilingus, and fellatio. S.A. sodomized one victim at knifepoint. Additionally, he engaged in frotteuristic behaviors, sometimes daily. While in residential treatment settings, he had engaged in oral and anal sex with his peers. He had been repeatedly discharged for these and other non-compliant behaviors.

At the time of our evaluation, S.A. had been in various juvenile institutions for over six years demonstrating minimal improvement. Although his generalized disruptive behavior stabilized within the therapeutic milieu and his mood symptoms responded positively to pharmacological treatment of his Bipolar Disorder, his paraphilic symptoms persisted. He continued to be troubled by intrusive deviant sexual thoughts and fantasies, some violent, involving prepubescent girls and boys. He continued to frotteurise other residents frequently. Given the nature of his severe paraphilia and treatment resistance, he was started on leuprolide at a dose of 7.5 mg. S.A. was maintained on this medication for 12 months. He reported suppression of general sexual drive and of pedophilic thoughts in particular. Several months into the treatment, while he told care providers that "the medicine is helping me," he continued to have pedophilic fantasies and continued to engage intermittently in frotteurism. He was started on depot-medroxyprogesterone at a weekly dose of 100 mg. Over time, staff observed him to be more appropriate on the unit with diminishing surreptitious sexual behavior as well as to be gradually more active and forthcoming in the group psychotherapy sessions. He began to develop and implement a sex offense relapse prevention plan. He reported a loss of ejaculatory function but was able to tolerate this.

Subject B

Subject B (S.B.) was a 19-year-old Caucasian male with Pedophilia, Frotteurism, Bipolar Disorder, Conduct Disorder, Mild Mental Retardation, and Mixed Receptive-Expressive Language Disorder. As a child, he suffered severe neglect and emotional, physical, as well as sexual abuse. He received special education services from an early age, but at times received home schooling or no schooling. Beginning in early adolescence and escalating over time, he developed severe affective instability, intermittent psychotic symptoms, and recurrent, serious self-injurious behaviors, which precipitated numerous psychiatric hospitalizations. His legal history was significant for Assault and Battery. He had, however, no legal charges for sexual offenses despite a substantial history of problematic sexual behaviors.

S.B. had a longstanding history of deviant sexual fantasies and behaviors that included a pattern of pedophilic, frotteuristic, voyeuristic, and transvestite acts. He began cross-dressing at age 6 and continued through adolescence. At the age of 13, he engaged in forced fellatio, cunnilingus, and vaginal intercourse with his two female prepubescent adoptive siblings. Though placed early on in residential treatment settings, S.B. failed to respond satisfactorily to treatment (e.g., psychopharmacological treatment for Bipolar

Disorder and sex offender specific treatment). Moreover, he was repeatedly discharged from these settings for non-compliance.

After being admitted to our institution, his mood symptoms and generalized disruptive behavior patterns stabilized within the therapeutic milieu, and he responded to the pharmacological treatment for his Bipolar Disorder. His paraphilic symptoms, however, persisted. He continued to report persistent, preoccupying fantasies that involved sexually coercive and violent acts with children that at times were ego-syntonic. He also continued to engage in sexually inappropriate behaviors, including frotteurism. Given his ongoing urges for deviant and violent sexual behaviors, treatment with leuprolide was initiated. S.B. was maintained on leuprolide for approximately 13 months. He reported a decrease in pedophilic fantasies and felt to have better control over them when they did occur. He also reported a reduction in masturbation to deviant sexual thoughts and imagery. Staff at the residential treatment facility reported a significant decrease in his frotteuristic behaviors, along with an increased investment on his part in individual and group psychotherapy. S.B. did not have side effects on leuprolide.

Subject C

Subject C (S.C.) was a 19-year-old African American male with Pedophilia, Bipolar Disorder, Conduct Disorder, Moderate Mental Retardation, Cannabis and Alcohol Abuse, Klinefelter's syndrome, Morbid Obesity, and lithium-induced hypothyroidism. S.C. had been living in residential treatment facilities for the past five to six years. He was raised in a violent family and community environment. He attended special education programs from early childhood because of behavioral and learning difficulties. Since age 13, he was psychiatrically hospitalized on numerous occasions for severe manic episodes, which were often associated with psychotic symptoms. Severe disorganization and impulsiveness remained prominent, even with intermittent remissions of his mania. His legal history was significant for Assault and Battery, Destruction of Property, and Theft. He spent most of his adolescence in residential treatment facilities.

S.C.'s sexual history was remarkable for early onset of violent sexual behavior patterns. At age 12 he reportedly engaged in oral sex and intercourse with two prepubescent family members who were under the age of seven. He subsequently was found guilty of Third Degree Sex Offense and Second Degree Rape. While in residential treatment settings, and despite psychotherapy, he continued to engage in inappropriate sexual behaviors with male peers (e.g., exhibiting himself, fondling, fellatio, and anal intercourse). This subject's inappropriate sexual behaviors were initially thought to emerge primarily out of his Bipolar Disorder, however his deviant sexual fantasies (e.g., coercive and violent sexual fantasies involving young children) and his heightened sex drive persisted despite significant (though not full) stabilization of his mood symptoms.

S.C. was started on a trial of leuprolide. Approximately two months into the treatment, he reported a decrease, though not extinction, of deviant sexual thoughts and a cessation in masturbatory behaviors. Although he continued to proposition other patients, staff noted a reduction in the frequency of inappropriate sexual behaviors. Though less sexually preoccupied, S.C.'s symptoms periodically worsened during subsequent manic episodes.

Subject D

Subject D (S.D.) was a 20-year-old Caucasian male with Paraphilia Not Otherwise Specified (characterized by sexual sadism and indiscriminate over-sexualized behavior), Mild Mental Retardation, Antisocial Personality Disorder, and a history of Attention-Deficit/Hyperactivity Disorder (ADHD) and Conduct Disorder. As a child, he was victim of sexual and physical abuse. He has a history of severe and chronic disruptive behaviors including assaults, firesetting, and cruelty to animals, requiring special education services from an early age. S.D. has been institutionalized for the better part of his adolescence, being in juvenile and adult residential settings since age 13, including psychiatric hospitalization for severe aggression. Medication trials include treatments with psychostimulant medications for ADHD related symptoms. S.D. has no reported history of vocational training or work experience.

S.D.'s sexual history was notable for exposure to pornography as early as age 6. By early adolescence he had developed a pattern of excessive masturbation along with frequent use of pornography. He began to engage in voyeuristic and exhibitionistic behaviors and made frequent calls to phone-sex hotlines. He had an ongoing incestuous sexual relationship with a female family member. At the age of 14, he sodomized a 2-year-old male infant and was found guilty of Sodomy and Sexual Assault. He subsequently was placed in residential treatment facilities, however he continued to engage in sexually inappropriate behaviors, calling phone sex services, having sex with younger male peers (one episode resulted in a Sexual Assault charge), and masturbating while using clothing that belonged to staff.

At the time of our evaluation, S.D. had been in a number of juvenile institutions for approximately seven years without showing significant signs of improvement. Although his generalized disruptive behavior was somewhat improved with the structure of the residential therapeutic milieu, his paraphilic symptoms had shown almost no response to any treatment modality. While in treatment at our facility, S.D. reported persistent, ego-dystonic sexual fantasies that included violence, aggression, and rape of both children and adults. Because of his presenting symptoms, S.D. was started on leuprolide at a dose of 7.5 mg.

After a few months, S.D. reported a dramatic decrease in his deviant sexual thoughts and violent sexual fantasies. His sexual drive was decreased but not eradicated, and he maintained the capacity for appropriate sexual arousal, masturbating once or twice a week to age appropriate sexual imagery. During the same time period, S.D.'s participation in group psychotherapy increased to the point that he began working on a relapse prevention plan. He received his high school diploma and was given the privilege to participate in an on-site vocational training program. He stated "I need this medication so I can return to the community. . . ." He did not report any side effects. At the age of 21, he was discharged back to the community after having been maintained on leuprolide for 13 months.

Subject E

Subject E (S.E.) was a 20-year-old African American male diagnosed with Pedophilia, Frotteurism, Bipolar Disorder, and Antisocial Personality Disorder. He did fairly well academically, receiving passing grades. He had a history of disruptive behaviors and legal involvement including adjudications for Assault and Battery and Destruction of Property. S.E.'s psychiatric history was notable for psychiatric hospitalizations, which occurred in the context of affective instability, depression, suicidality, and aggressive behaviors. Medication trials include treatments with antidepressants, mood-stabilizers, and antipsychotic medications.

S.E.'s sexual history was noteworthy for early exposure to pornography. S.E. reported a deviant sexual arousal pattern and sexualized behaviors. He reportedly offended against at least seven

children, of both genders, ranging in age from 4–7. He typically groomed and fondled his victims before engaging in fellatio, cunnilingus, and/or vaginal penetration. S.E. was found guilty of 2nd, 3rd, and 4th Degree Sexual Assault. While in residential treatment settings, he reportedly continued to engage in sexually inappropriate behaviors, such as frotteurism, fellatio, and anal intercourse with other patients.

At the time of our evaluation he had been residing in juvenile facilities for the previous four years. He was persistently preoccupied with erotic fantasies that involved sexual acts with children. S.E. continued to frotteurise other residents and staff. He was started on leuprolide at a dose of 7.5 mg and was maintained on this medication for 10 months. He reported a decrease in deviant sexual fantasies, frotteuristic urges, and masturbation. Though staff indicated that he was more attentive in school and seemingly less preoccupied by sex, S.E. continued to engage in frotteuristic behaviors and continued to proposition other patients for sex, though less frequently. S.E. did not report any side effects to leuprolide.

Subject F

Subject F (S.F.) was a 19-year-old Caucasian male diagnosed with Pedophilia, Sexual Sadism, Tourette's Disorder, and Borderline Intellectual Functioning. He had a history of physical and sexual abuse. He received special education programming throughout his childhood. As a child, he engaged in fire-setting behaviors and cruelty to animals. His legal history was significant for Theft, Destruction of Property, and Disorderly Conduct.

S.F.'s sexual history was remarkable for early exposure to pornographic videos and early onset of masturbatory behaviors (at about age 8) and sexual preoccupation. As an adolescent, he sexually abused a total of 14 victims of both genders, ranging in age from 6 months to 12 years. This included fondling, forced fellatio, vaginal penetration and sodomy. He was found guilty of two counts of 3rd Degree Sex Offense, two counts of 4th Degree Sex Offense, and two counts of Perverted Practice. Following his adjudication, he was admitted to a residential treatment setting, where he reportedly continued to be sexually provocative and non-compliant with treatment recommendations. Subsequently, he was discharged from that setting because of ongoing frotteuristic and exhibitionistic behaviors. Previous medication trials include treatment with leuprolide, which was discontinued because of retrograde ejaculation.

At the time of our evaluation, S.F. had been in juvenile facilities for the preceding three to four years. He reported elevated and difficult to control pedophilic sexual fantasies and urges. S.F. also reported disturbing sexual fantasies that involved sexually aggressive acts with children including the fantasy of gaining sexual pleasure from hurting them.

Although unhappy about the previously experienced adverse effect (i.e., retrograde ejaculation), S.F. eventually agreed to resume treatment with leuprolide in order to lessen his sexual preoccupation and decrease his heightened sexual drive. Although S.F. noted a gradual decrease in his sexual drive and his pedophilic thoughts and fantasies, he was able to maintain arousal to age appropriate fantasies. Following treatment with leuprolide, he was more active in group psychotherapy sessions and was noted to be appropriate on the unit. He was maintained on leuprolide for approximately 13 months without re-experiencing retrograde ejaculation.

Discussion

These six cases illustrate our preliminary experience with the use of leuprolide in the treatment of paraphilias in adolescent and young adult patients in a residential treatment center (See Table 1). The generally favorable outcome suggests that the use of antiandrogens, specifically leuprolide, shows promise as one treatment modality

TABLE 1—*Summary of cases.*

Patient	Age	Diagnoses	Duration of Leuprolide Rx/Observation Period	Other Concurrent Medications	Outcome	Side Effects
SA	20	Pedophilia, Frotteurism, Bipolar Disorder, Alcohol Abuse, Conduct Disorder, Borderline Intellectual Functioning	12 months/ January 2002– December 2002	Valproic acid, risperidone, and MPA	Much improved	Loss of ejaculation
SB	19	Pedophilia, Frotteurism, Bipolar Disorder, Conduct Disorder, Mild Mental Retardation, Mixed Receptive-Expressive Language Disorder	13 months/ December 2001– December 2002	Valproic acid, lithium, paroxetine, imipramine, quetiapine, and desmopressine	Much improved	None
SC	19	Bipolar Disorder, Conduct Disorder, Moderate Mental Retardation, Cannabis and Alcohol Abuse, Pedophilia, Klinefelter's Syndrome, Morbid Obesity, Lithium-induced hypothyroidism	16 months/ September 2001– December 2002	Haloperidol, quetiapine, carbamazepine, vaplproic acid, benztropine, and desmopressine	Moderately improved	None
SD	20	Paraphilia NOS (with elements of Sexual Sadism and indiscriminate oversexualized behavior), Mild Mental Retardation, Antisocial Personality Disorder, history of Attention-Deficit/ Hyperactivity Disorder	13 months/ August 2001– September 2002	None	Much improved	None
SE	20	Pedophilia, Frotteurism, Bipolar Disorder, Antisocial Personality Disorder	10 months/ February 2002– December 2002	Valproic acid and quetiapine	Moderately improved	None
SF	19	Pedophilia, Sexual Sadism, Tourette's Disorder, Borderline Intellectual Functioning	13 months/ December 2001– December 2002	Risperidone	Much improved	Retrograde ejaculation with previous trial; no side effects with present trial

in the treatment of young adult sex offenders with paraphilic disorders. All six subjects in this study reported a significant reduction in sex drive with an increased ability to resist sexual thoughts and feelings and a decrease in masturbatory and other sexual behaviors. Two of the subjects also experienced a qualitative as well as quantitative change in sexual drive, with a disproportionate decrease in sexually deviant or inappropriate thoughts, fantasies and/or behaviors, relative to more normative sexual experiences. These subjects reported improvements in normative sexual thought patterns and masturbatory fantasies and behaviors.

Several considerations regarding the use of leuprolide in this population bear further discussion, including indications for antiandrogen use, issues of patient selection, the anticipated role of leuprolide in the overall treatment plan, indicators of treatment response and effectiveness, duration of treatment, side effects, and medication monitoring.

The first critical point regarding indications for antiandrogen therapy is that it is not generally considered to be an appropriate intervention for all sex offenders, but only for those with paraphilic disorders. Not all sex offenders have paraphilias. Many, perhaps even the majority, of instances of sexual misconduct may arise from pathologies other than paraphilias. In adolescents and young adults, some examples include global patterns of conduct problems in conjunction with potentially incipient antisocial personality disorder; pervasive impairments in interpersonal relationships; and isolated, opportunistic, or impulsive sexual behavior problems. In these examples, the sexual domain is only one of many problem areas, and often not even the most problematic. Some other non-paraphilic adolescent sex offenders have time-limited, reactive patterns of over-sexualized behaviors resulting from behavioral modeling, such as premature sexualization or sexual abuse. The paraphilias, on the other hand, are characterized by persistent and focal difficulties in patterns of sexual arousal and behavior in which the sexual domain is disturbed out of proportion to other broad problems of conduct and/or interpersonal relationships.

There are several characteristics of paraphilic disorders that may be suitable targets for antiandrogen treatment. One key indication for antiandrogen use is the presence of high sexual drive and intrusive sexual arousal states. Examples of high drive in our subjects included frequent and difficult to control sexual thoughts, frequent erections, and other manifestations of arousal in inappropriate situations, frequent sexual behaviors despite consequences, considerable energy required to constrain sexual behaviors, unusually high frequencies of masturbation, or frequent sexualization of non-sexual contexts. Another indication for antiandrogen treatment, even in the absence of an increased sexual drive, is a fixed or increasingly emerging pattern of stereotypic, deviant, impairing sexual arousal. Examples include deviance in the objects of sexual arousal, such as pedophilia and fetishism, or in the mode of arousing sexual expression, such as frotteurism, exhibitionism, and sexual sadism.

Another important factor in the selection of candidates for antiandrogen therapy is severity of presentation. Some clinicians consider antiandrogens to be a first-line treatment in all adult paraphilic patients. For late adolescents or young adults, antiandrogens are generally not considered first line, but rather they are reserved for those who have proven refractory to other treatment modalities. Antiandrogen therapy should never be considered adequate as the only treatment modality for any paraphilic patient, but instead it should always be considered as one aspect of a comprehensive treatment program that also includes psychosocial rehabilitation/habilitation modalities.

A number of clinical indicators are useful in monitoring treatment response and effectiveness of antiandrogen medications. Patients on antiandrogens should be asked routinely about subjective indicators of sexual drive, such as changes in frequency of fantasies, spontaneous erections, masturbatory practices, time required to achieve orgasm, refractory period following masturbation. Patients will often report that they feel more "in control" over their sexual fantasies and impulses and less easily aroused and/or distracted by sexual stimuli. In residential treatment settings, staff observations of changes in overt sexual behavior, such as decreases in frequency of sexual comments, flirtation, sexual behaviors, etc., should be tracked and documented. Standardized questionnaires can also serve to assess and document treatment response and progress. Typically some initial evidence of a response to antiandrogen treatment is expected within a few months.

With respect to the impact on sexual drive, there is a very thin line between desired therapeutic effects and subjectively "intolerable" side effects for patients, especially for adolescents. Patients may object if they are unable to achieve erections or find it too difficult to masturbate. This may create a compliance problem. The problem of "over-suppression" can at times be addressed by dosage reduction (from 7.5 mg per month to 3.75 mg). Although other reported side effects include hot flashes, myalgias, gynecomastia, paresthesias, nausea, vomiting, diarrhea, and alopecia, these did not prove problematic in our small sample. In the five (out of six) subjects who were observed for long enough, a first annual follow up DEXA scan did not show any clinically significant signs of osteopenia.

The optimal duration of antiandrogen treatment is not known. The typical persistence and chronicity of paraphilia indicate that therapy usually should be considered a long-term commitment. For some patients, antiandrogen use may be considered a relatively temporary (9–18 months) adjunctive component to treatment. This serves to mobilize a treatment strategy in which sexual drive suppression reduces distraction and sexual preoccupation, giving other modalities, such as cognitive behavioral therapy, therapeutic milieu, and social skills training, a chance to work. In other cases, the need for long-term sexual drive suppression is considered paramount, and antiandrogens potentially may be considered an indefinite form of maintenance treatment.

These cases also highlight the co-occurrence of paraphilias with other psychiatric, developmental, and genetic disorders. The literature strongly supports the high rates of psychiatric co-morbidity in paraphilias, both in adults and in adolescents (21–26). Symptoms of co-morbid psychiatric disorders may significantly complicate the assessment and diagnosis of paraphilia. Moreover, if left untreated, co-morbid psychiatric disorders may also negatively influence the course and prognosis of the paraphilic disorder. S.C. illustrates both of these points regarding the complexity of diagnosing and treating psychiatric co-morbidity in a young adult sex offender.

In conclusion, treatment of paraphilic patients should be broad and versatile, encompassing both psychosexual therapies, and where indicated, pharmacotherapy. Though preliminary, the findings of this study suggest that leuprolide is a safe and effective treatment of paraphilia in young adult patients. These findings support the use of leuprolide in severely impaired paraphilic patients. It is encouraging that in this study such a high severity population shows improvement with treatment. The severity profile of our subjects included severe psychiatric co-morbidity in all six, as well as cognitive impairment in five out of six. Further exploration of effective pharmacologic treatments with adolescent and young adult sex offenders is needed with the use of more rigorous research methodologies, including collection of quantitative data with a larger sample size, more homogeneous diagnostic groups, and the use of comparison groups.

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Dr. Fishman is President, Chairman of the Board, and Medical Director of Chesapeake Treatment Center (CTC). Data presented in this article were collected from the charts of patients treated at CTC. Dr. Fishman is a faculty member of the Johns Hopkins University and is a beneficiary of the trust that owns CTC. The terms of this arrangement are being managed by the Johns Hopkins University in accordance with its conflict of interest policies.

Additional information and reprint requests:
Fabian M. Saleh, M.D.
UMass Memorial Medical Center, Inc
University Campus
Department of Psychiatry, S7-808
55 Lake Avenue North
Worcester, MA 01655