The Use of Medication in the Treatment of Sex Offenders

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Introduction

Treatment for sex offenders typically takes the form of psychological interventions such as the cognitive-behavioural type approaches used by the sex offender treatment programmes delivered in British prisons. Its focus is on assisting offenders to recognise the attitudes and behaviours that increase their risk of reoffending, as well as helping them to develop strategies to reduce their risk. However, it should not be forgotten, although it often is, that sex is also inherent to sex offending — while emotional and psychological factors contribute to sex offending behaviour, at its root lies the pressure exerted by sexual drive.

Sex drive, the characteristics of sexual arousal, and sexual behaviour are mediated by biological mechanisms. The more sophisticated the species the more ‘psychological’ control the individual has over the initiation and maintenance of sexual activity, but the strength and direction of the drive itself are largely well established by adulthood, and as such they can be manipulated but not overridden. While there is more scope for such manipulation in humans, like hunger and thirst our control over our sex drives is limited. Thus, an individual can seek to avoid sexual arousal cues, or consciously direct his or her attention to selected stimuli while ignoring others, but in the end this suppresses rather than changes or eliminates the sex drive, which like an underground stream continues to flow and may at any time resurface.

Because sex drive is biological in nature, it can be influenced by physical interventions. This means that when psychological type approaches on their own are unsuccessful in bringing about sufficient change in sexually problematic behaviour, physical therapies can potentially provide a useful adjunct to treatment in appropriate cases. Although this usually comprises medication, in theory it also includes castration.

Without question, castration in males (that is, the removal of the testicles, or orchidectomy) brings about a large reduction in the intensity of sexual drive and in sexual responsiveness generally. It achieves this effect by removing the main source of production for the male hormone testosterone. In the early part of the twentieth century a number of European countries, such as Denmark, the Netherlands, Switzerland and Germany passed legislation to enable the castration of sex offenders, and though in practice many of those castrated were neither prolific offenders nor were their offences severe (many of those castrated, for example, were learning disabled, and their offences appear to have included crimes such as homosexuality and indecent exposure), recidivism rates of under five per cent over long follow-up periods were reported. Since then there have been periodic calls for the reintroduction of castration of sex offenders, typically after a particularly heinous sex crime has been committed, although whether as a symbolic punishment or as means of reducing risk is often not clear.

Castration, however, carries with it significant negative effects on health, it is mutilating, and as referred to above it can easily transmute into punishment rather than treatment; indeed, the extreme nature of the intervention means that even if it were to become an accepted procedure, it would almost certainly have to be reserved for only the most extreme cases, limiting its practical importance.

Medication can achieve many of the same effects on sex drive as castration. Indeed, when medication is used in the treatment of sex offenders it is frequently referred to as ‘chemical castration’, although this fails to distinguish between the different types of drugs that are prescribed, not all of which act directly through testosterone. Unlike castration, medication can be titrated, and its side effects are more easily managed. Because the negative connotations of the term ‘chemical castration’ in itself may deter offenders from considering a potentially effective treatment, most doctors prefer to reserve the word ‘castration’ for the surgical procedure.

The rationale for using medication in the treatment of sex offenders

Drugs used in the treatment of sex offenders may interfere directly with the actions of testosterone, in which case they are typically referred to as either anti-libidinals, because of their primary affect of reducing libido (that is, sex drive), or anti-androgens (testosterone being a member of the androgen hormone group). Alternatively, medication such as
some anti-depressants and major tranquillisers act on other physiological systems involved in sexual arousal.

In order to appreciate how these different drugs exert their effects, as well as the rationale for their use in general, it is necessary to have some understanding of the neurobiology of sexual functioning. Our knowledge of the neurobiological basis of sexual functioning, however, is extremely limited. Much of it is based on animal studies that are of uncertain relevance to humans, while research in humans is made difficult by the complex interaction of developmental, social, psychological and biological factors that contribute to sexual response patterns. As matters become even more complicated when one considers differences between men and women, for present purposes the discussion here will focus only on men.

Testosterone

Testosterone is often thought of as the male hormone, but though it is also present and active in females, it is substantially more abundant in men than in woman. It is fundamental to male physical and sexual development, sex drive and sexual functioning. It also plays a role, at least in primates and some other mammalian species, in dominance hierarchies and aggression.

As referred to above, testosterone is produced mainly by the testes, although small amounts are made in the adrenal glands. During pregnancy it ‘sculpts’ the male brain, influencing the way in which the adult will later respond to a range of environmental factors, including but not only sexual stimuli. Another period of ‘sculpting’ is believed to occur around the time of puberty, when social experience may also make an important contribution to subsequent brain organisation. In addition, testosterone is necessary for the development of male secondary physical and sexual characteristics, for example the pattern of muscle development, the lowering in the pitch of the voice, and hair distribution.

As well as these structural effects, testosterone has a range of so-called activational effects that are more transient than the physical changes referred to above, but which are a function of them. A specific example of this is sexual arousal and sexual responsiveness, both of which require the presence of the hormone. Circulating levels of testosterone, however, are substantially greater than needed to maintain sexual performance, suggesting that actions such as the maintenance of male secondary sexual characteristics require much larger amounts of hormone than that required for sexual functioning.

The production of testosterone in the testes is stimulated by a hormone called luteinising hormone (LH) that is released by the pituitary gland in the brain — in the absence of LH testosterone production by the testes ceases. The release of LH in turn is controlled by another hormone, gonadotropin hormone releasing hormone (GnRH), which is synthesised in, and secreted by, a collection of nerve cells in the area of the brain known as the hypothalamus, which sits immediately above the pituitary gland (Figure 1). A negative feedback loop means that testosterone inhibits the release of both LH and GnRH, as do higher centres in the brain (Figure 2).

Figure 1: The location of the pituitary gland and the hypothalamus

Figure 2: The control of testosterone production

It is important to recognise that the main effect of testosterone on sexual functioning relates to spontaneous sexual interest and behaviour. Sexual performance itself, including the ability to have erections and to engage in sexual intercourse, may still be preserved to some extent even in the absence of testosterone, although in such cases the erectile response becomes strongly stimulus bound — that is, it depends on immediate sexual cues such as erotic imagery or tactile stimulation, and lapses once the stimulus is removed.

Although testosterone is necessary for normal levels of sexual interest and arousal, variations in testosterone levels do not have an immediate effect on sexual functioning — changes in blood concentrations take weeks to manifest themselves. For example, when testosterone replacement is withdrawn from men who have been castrated for medical reasons, a reduction in sexual interest does not become apparent for three to four weeks, although sexual interest is usually restored somewhat quicker, in about two weeks. When testosterone levels are experimentally raised in men from normal baseline concentrations, gradual changes in sexual arousal and mood (typically an increase in irritability) are sometimes but not always observed.

While the importance of testosterone in sexual arousal can not be disputed, its mode of action, as well as its precise effects, remain to be elucidated. It may, for instance, alter the responsiveness of either general or specific neurological arousal mechanisms, it may have an effect on the processing of sensory stimuli, it may influence motivation and attention, it might do all three, or it may act in some entirely different way. What is clear is that normal levels fluctuate within a wide range, and it is only when plasma concentrations fall below a very low threshold (or perhaps rise above a very high one) that overt changes in functioning and behaviour are observed, albeit over a delayed timeframe.

Similarly, although testosterone is known to be associated with aggression, the relationship is modest and the interaction complex. Occasional studies have reported that testosterone levels are relatively high in violent sex offenders, but the results of this type of research are not consistent, and in any case abnormally high levels have not been described. Furthermore, separating cause from effect is difficult, as changes in testosterone levels often follow, rather than precede, the behaviour of relevance. For instance, testosterone levels are known to be associated with dominance hierarchies in primates, but it has been shown that increases in testosterone are most marked after a male becomes the dominant member of the group, and decreases in testosterone similarly take place after he has lost his dominant role. In humans, it has been observed that testosterone levels are higher in the members of winning teams in competitive sports, but the rise occurs after, not before, the competition has finished, and appears to be most closely associated with mood state (this effect is also found in spectators who support the winning team).

Testosterone is a necessary component of normal sexual functioning, but it does not act in isolation. Furthermore, because testosterone receptors are spread widely throughout the body and the brain, interfering with its activity will have a range of effects in addition to those on sexual behaviour, including having an impact on the endocrine and cardiovascular systems.

Other hormones and neurotransmitters

While the importance of testosterone in sexual arousal can not be disputed, its mode of action, as well as its precise effects, remain to be elucidated. Emotional control, aggression and memory are most closely associated with sexual drive and functioning. The importance of this brain region arises from its role in modulating the hormonal environment of the body, and from its influence on emotional states. A number of hormones and neurotransmitters (chemical messengers released by nerve cells) are active in this brain region, but two neurotransmitters, dopamine and serotonin, are especially relevant to sexual functioning.

Dopamine is involved in a number of functional systems, including those associated with appetitive, goal-driven behaviours such as eating, sleeping, and sex. In respect of sexual functioning, dopamine pathways are facilitative of sexual arousal and behaviour, and are synergistic with testosterone: testosterone enhances dopamine activity in the limbic region of the brain, increasing dopamine release and perhaps increasing dopamine receptor sensitivity, while dopamine in turn appears to enhance the effects of testosterone. In addition, dopamine inhibits the release of the hormone prolactin from the pituitary gland; although the physiological function of...
this hormone in men is unclear (it has an important role in lactation and ovarian function in women), high levels are associated with erectile difficulties and a diminution of libido.

Drugs that reduce or block the activity of dopamine in the limbic region of the brain, such as the major tranquillisers prescribed in schizophrenia, are associated with impotence and loss of libido as common side effects. This appears to relate both to an inhibition of the direct actions of dopamine, and to the associated rise in prolactin levels caused by the medication. An increase in dopamine activity, on the other hand, may have the reverse effect of stimulating libido.

Serotonin (also known as 5-hydroxytryptamine, or 5-HT for short), tends to have effects that are opposite to those of dopamine. Thus, where the latter is facilitative in respect of appetitive behaviours, serotonin is primarily inhibitory (although the situation is complicated by the large number of different serotonergic receptors found in the brain, with some having contrasting effects). Low levels of serotonin have been associated with mood disorders, obsessive compulsive disorder, panic attacks, and impulsive aggression. Drugs that increase levels of serotonin (called selective serotonin reuptake inhibitors, or SSRIs) are commonly prescribed in the treatment of depression and a range of other conditions, including obsessive compulsive disorder (OCD) and addictions. When used in these conditions the SSRIs are often found to have a negative impact on various aspects of sexual functioning, including a loss of libido, erectile dysfunction, and impaired ejaculation. Other drugs that act on serotonergic receptors may have similar effects.

Medication, hormones, and neurotransmitters

Although testosterone, dopamine and serotonin play key roles in sexual arousal and functioning, we are well short of understanding the detail of how they act, or how they interact with other neurotransmitters and hormones. Two main pharmacological strategies have been employed in the treatment of sex offenders. One seeks to reduce the activity of testosterone directly through the use of anti-adrenergic medication, the other aims to increase and enhance the countering influences of serotonin.

Anti-androgens

Anti-androgens can act in a variety of ways, including the reduction of testosterone synthesis, blocking its access to receptors in its target cells, or increasing its break-down and removal from the body. Doctors have gained experience of these types of drug as they are often prescribed in the treatment of prostate cancer, a type of tumour whose growth is exacerbated by the presence of testosterone.

In the 1940s, oestrogens (the primary sex hormones found in females) were first prescribed for sex offenders, and were reported to reduce substantially their levels of sexual interest and masturbatory activity. However, the associated marked side effects, particularly nausea, serious cardiovascular complications, and feminization, made their use problematic. They were superseded in the 1960s by two anti-androgens, cyproterone acetate (also known as Androcur) in Europe and Canada, and medroxyprogesterone (a long-acting female contraceptive also known as Depo-Provera) in the United States, and to a lesser extent Canada. Both these drugs bring about a reduction in testosterone concentration and activity to that seen following physical castration, but unlike castration their doses can be titrated so that sexual arousal is reduced but not eliminated. Side effects, however, remain a problem, particularly breast growth, the risk of ischemic heart disease, and various other symptoms associated with the female menopause, such as hot flushes.

Increasingly, drugs which act by draining the pituitary gland of luteinising hormone by mimicking the action of GnRH (see above), and thereby inhibiting the production of testosterone by the testes, have been used. These drugs, referred to as GnRH agonists (examples of which are leuprolide, tryptorelin, and goserelin), appear to have a more potent impact on
testosterone levels and sexual arousal than the traditional anti-androgens, possibly because GnRH neurons also project to other brain areas in addition to the pituitary. Although their side effect profile appears to be a bit milder than the traditional anti-androgens, osteoporosis (thinning of the bones with a risk of fracture) is a particular problem. The GnRH agonists are also significantly more expensive than drugs like cyproterone acetate.

**Selective serotonin reuptake inhibitors**

Because of the relationship between serotonin and sexual functioning, and because of the resemblance between the sexual ruminations, intrusive fantasies and apparently compulsive sexual behaviours found in some sex offenders and the characteristics of obsessive-compulsive symptomatology, selective serotonin re-uptake inhibitors (SSRIs), which as referred to above are used in the treatment of depression and OCD, were proposed for use in some sexual disorders. Fluoxetine (more commonly known as Prozac), sertraline and fluvoxamine are the SSRIs most commonly prescribed in this respect. The main impact of these drugs is to reduce the intensity and frequency of sexual fantasies, and to lessen the force of sexual urges. The SSRIs are associated with a much milder side effect profile than the anti-androgens, with gastrointestinal symptoms such as nausea and change in bowel habit being most common, but they do not have the primary anti-libidinal effect of anti-androgens.

**How well does medication work?**

A recent large meta-analysis of treatment outcome (a study in which the results of a large number of research trials are combined) reported that pharmacological treatments had a much higher impact on recidivism rates than did psychological treatments on their own, replicating the findings of earlier reviews. It was noted, however, that the pharmacological studies typically also included a cognitive-behavioural component, and that this had an independent treatment effect. Having said this, most of the pharmacological studies had methodological shortcomings to them, limiting the confidence with which one can generalise from them (although this is, of course, also the case with most of the studies involving cognitive-behavioural treatment).

**Anti-androgens**

There have been many studies which have involved the use of anti-androgens in sex offenders. As indicated above, they typically show low recidivism rates, usually below five per cent, which is of the same order as that described in the follow-ups of physically castrated offenders, as well as marked reductions in the level of sexual interest, sexual fantasy, and sexual behaviour. Most of these studies, however, involve only small numbers of subjects, they often fail to take into account subjects who drop out of treatment, and they tend to rely on self report measures of sexual activity (one interesting study in which a placebo was used and which incorporated polygraphy found that while both groups reported a reduction in sexual activity, only those on active medication passed the polygraph). In addition, double blind randomised control trials are rare, although in the few studies where this is the case medication produces a significantly greater reduction in sexual activity and sexual interest than does placebo.

There is a smaller research literature in respect of the GnRH agonists, which mostly relates to case reports, although there have also been a few trials. Again, very low reoffending rates are described, with apparently better outcomes for offenders who had previously been unsuccessfully prescribed either cyproterone or medroxy-progesterone. One study found, for example, that in men who remained on the GnRH agonist tryptorelin for a year, the number of sexual fantasies and urges disappeared completely, and masturbation frequency dropped to at most twice a fortnight. Again, however, sample sizes were small, comparison groups absent, and outcome highly dependent on self-report.

**Selective serotonin reuptake inhibitors**

As with the anti-libidinals, the evidence concerning the use of SSRIs in the treatment of sex offenders is supportive, but not robust. Most of the reports involve small numbers of patients and short

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follow-up periods, there is a heavy reliance on self-report, and there is an absence of double blind control studies. Nevertheless, outcomes are generally positive, with most studies reporting a reduction in the frequency and intensity of sexual fantasy, urges and arousal, often without negative effects on normal sexual behaviour. There does not appear to be much difference between the various SSRIs, although one study found that subjects who did not respond to sertraline improved when switched to fluoxetine.

Overall, research studies indicate that medication can be effective in reducing risk in sex offenders, although limitations in the research mean that it is difficult to quantify by how much. From a clinical perspective, however, when successful it often appears to be dramatically so, with offenders reporting great benefit from no longer being preoccupied by sexual thoughts. It can allow them to participate in psychological treatment programmes where previously they were too distracted to take part, and it means they can focus on other aspects of their day-to-day lives.

**Cautions in the use of medication**

As referred to above, the side effect profile of the SSRIs is reasonably mild. The anti-androgens, however, are associated with significant side effects, and their use must be closely monitored through regular blood tests; the GnRH agonists in addition require periodic bone scans to assess for decreases in bone density. Apart from bone thinning with the GnRH agonists, however, in practice serious side effects from the anti-androgens appear to be uncommon, which is reassuring given the potential for their negative impact on cardiovascular, liver, and endocrine systems.

There sometimes appears to be a reluctance to prescribe medication for sex offenders for reasons that are unclear. On occasions this may relate to a misplaced belief that medication implies illness, and hence less responsibility for one’s behaviour — a so-called medical model. But because medication may make it easier to control sexual drive does not mean that the individual should not have controlled his drive in the first place. Similarly, pharmacological treatment is not being prescribed as a cure: typically medication is an adjunct to psychological treatment, not a substitute for it. One must be careful not to allow ideological views to block attempts to assist offenders, and of course to enhance public safety.

Reference to public safety, however, raises particularly difficult issues for psychiatrists when prescribing for sexual offenders: are they treating a patient, or are they acting as agents of social control whose primary responsibility is to society rather than the patient in their care? Should patients consent to pharmacological treatment, informed of its risks and benefits, and thus take it voluntarily, or should they be compelled to do so? In this respect it is of interest that many of the protocols used in prescribing seem to focus more on risk than clinical indication, with SSRIs reserved for less serious offenders, oral anti-androgens for those who are considered to be higher risk, and injectable anti-androgens reserved for the highest risk, even though those who develop these protocols typically refer to them as having a clinical rather than a societal, risk-oriented basis.

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Although there is no data regarding the extent to which medication is prescribed for sex offenders in England and Wales, numbers are almost certainly low, and it is likely that there is a small but not insignificant
number of offenders who might benefit from medication who are not receiving it. This is partly because of a lack of awareness regarding the indications for SSRIs and anti-androgens amongst those probation officers and psychologists who treat and supervise sex offenders, and partly because of a lack of psychiatrists with experience of prescribing in this area.

To address these twin problems, the Department of Health, in conjunction with the Prison and Probation Services, initiated funding in late 2007 to establish a network of psychiatrists with an interest and expertise in sex offender treatment, focusing on medication. The aim is to facilitate referral of appropriate offenders by identifying psychiatrists willing to take on this work in all areas of the country, to develop assessment and prescribing protocols, and to provide consultation for less experienced psychiatrists where necessary. It remains to be seen how many new referrals will be generated by this initiative, but if more than a few there will almost certainly be arguments between the Department of Health and the Ministry of Justice over who should pick up the bill.

Where should we go from here?

Clearly, medication is not appropriate for all sex offenders, and the reality is that the numbers who might benefit will not be large, possibly in the region of 5 per cent to 10 per cent of sex offenders taking part in probation and prison programmes. While the empirical basis for the efficacy of medication in the treatment of sex offenders is imperfect, anti-androgens and SSRI medication appears to be clinically effective —— there are good theoretical reasons for their use, and the research evidence is supportive, if not definitive. Of course, sexual behaviour is more than simply the outcome of testosterone interacting with neurotransmitters in the brain, but by targeting these substrates individuals can be provided assistance in controlling what is in effect a strong biological drive.

The use of medication to treat sex offenders raises the interesting question of whether these individuals suffer from a ‘medical condition’ that justifies treatment from the National Health Service. However, the main issue must surely be whether doctors have anything to offer. If they do, then the argument about who pays will need to be resolved if medication is to have any significant impact on sexual reoffending rates in England and Wales.